

SYNOPSIS OF COURSES

100 LEVEL

GST 101: USE OF ENGLISH I (1, 1, 0) 2 Units

Effective communication and writing in English. Study skills, writing of easy answer instruction on lexis, Sentence construction, outlines and paragraphs.

GST 102: USE OF ENGLISH II (1, 1, 0) 2 Units

Collection and organization of materials and logical presentation; Functions and logical presentation of papers. Use of library; phonetics; art of public speaking and oral communication.

GST 110: SCIENCE, ENGINEERING AND TECHNOLOGY IN SOCIETY (1, 0, 0) 1 Unit

Classification of social systems: interpersonal relationship, personality traits and leadership qualities. The role of the media. Meaning, scope and ices of development; historical perspectives, ideological bases, economic, political and social factors of development, self-reliance and national development.

PHY 101: GENERAL PHYSICS I (2, 1, 1) 4 Units

Mechanics, physical qualities, units, dimensions, space, time, frames of reference, vector and scalar, kinematics linear motion, vertical motion, circular motion, gravitation/dynamics equilibrium, work, energy, mass, momentum, law of inertia, rotational motion, simple harmonic motion, conservation laws, simple machines, fundamental laws of static's and dynamic, Galilean invariance. Heat: heat and temperature, work heat capacities, thermal expansion of solids liquid and gases, latent heat, gas laws, heat transfer, isothermal and adiabatic changes. Laws of thermodynamics. Simple kinetic theory of gases. The van der Waal's gas. Light: Basic concepts and properties of waves were nature of light mirrors, lenses, prism, and optical instrument. Sound: propagation of sound waves, properties of sound wave, velocity, pitch, resonance, overtones, beats, applications.

Selected experiments on topics covered by PHY III.

Application of a variety of simple experimental techniques with emphasis on quantitative measurement experimental errors and graphical analysis.

PHY 102: GENERAL PHYSICS II (2, 1, 1) 4 Units

Electrostatics electric charges, forces between charges, static electricity, conductors and current, dielectric, heating of currents. Magnetic fields-fields due to flat coil, solenoid and infinitely long straight wire, force between current-carrying conductors, electrolysis, ammeters, voltmeter, magnetic induction, Maxwell's equations, electric magnetic oscillations, waves and applications. Properties of matter classification of matter-solids, liquids and gases; force between atoms and molecules, molecular theory of matter, elasticity, plasticity, Hooke's law Young's shear and Bulk moduli, crystalline and non-crystalline materials, hydrostatics-pressure, Buoyancy, Archimedes's Principe, Hydrodynamics-streamlines, Bernoulli and continuity equations, turbulence, Reynolds's number, viscosity, laminar flow, Poisson's equation, surface tension adhesion, cohesion, capillary, drop and bubbles.

Selected experiment on topics covered in General Physics II (PHY 121) with emphasis on experimental techniques, quantitative measurements and experimental errors and graphical analysis.

CHM 101: GENERAL CHEMISTRY I (2, 1, 1) 4 Units

Atoms, molecules and chemical reaction, chemical equations and stoichiometry. Atomic structure, periodic table and period properties. Modern electronic theory of atoms, structure of solid; radioactive; chemical bonding; properties of gases, liquid and solids. Solutions of solids, liquids and thermodynamics; chemical kinetics introductions electrochemistry.

Determination of the densities of solid and liquid, empirical and molecular formulae. Separation of binary mixtures, Gravimetric determination of the number of molecular of water of hydration in hydrated salt Single and double replacement reaction Writing Lewis structures for atoms, ions, molecular and products of chemical reactions. Calculations of energies of excitation and determination of the excited states of atoms by the application of Bohr's theory of the hydrogen atom and quantum chemistry.

CHM 102: GENERAL CHEMISTRY II (2, 1, 1) 4 Units

Historical survey of the development and importance of organic chemistry nomenclature and classes of organic compound; homologous series; functional groups; isolation and purification of organic compounds; qualitative and quantitative organic chemistry stereochemistry. Determination of structure of organic compounds, electronic theory in organic chemistry; saturated hydrocarbons unsaturated hydrocarbons and their reactions. The chemistry of elected metals and non-metals. Qualitative analysis.

Examination of the physical properties (physical state appearance, odour, ignition test) of organic compounds Purification of organic compounds by re-crystallization and distillation. The use of melting point and boiling point as criteria of purity. Solubility tests (in hot and cold water and in either). Detection of elements present in organic compounds. Detection of functional groups present in organic compounds. A sequence of chemical reactions involving copper.

MTH 101: GENERAL MATHEMATICS I (3, 1, 0) 4 Units

Set theory sets, union and intersection, the empty and universal sets, complements, subsets, Venn diagrams. ALGEBRA OF REAL NUMBERS indexes, logarithms, surds theory of quadratic equations, simultaneous equation; simple inequalities; polynomials and their factorization the remainder theorem, relational functions and partial fractions. Permutation and combinations, the binomial theorem, sequences and series, summation of finite series. A P and G.P. TRIGONOMETRY Basic trigonometric functions and their properties; trigonometric identities and equations; application to solution to triangles, trigonometric function of angles of triangle, trigonometric function of angles of any magnitude, addition and factor formula. Pre-requisite: SSS mathematics or equivalent.

MTH 102: Elementary Mathematics II (3, 1, 0) 4 Units

Transcendental functions. Hyperbolic functions. Inverse functions. Logarithmic differentiation. Methods of integration, integration of rational functions. Integration by substitution, integration by parts. Improper integrals. Applications: Areas and volumes. Centre of mass. Ordinary differential equations with constant coefficients. Applications: Plane analytic geometry. Rectangular Cartesian coordinates. Distance between two points. The straight line. Loci. The circle, parabola, ellipse and hyperbola. Second degree curves. Plane polar coordinate system. Graphs of plane equations. Plane areas in polar coordinates. Vectors. Vector addition and applications. Products of three or more vectors. Vector functions and their derivatives. Velocity and acceleration. Matrix algebra. Addition and multiplication. Transpose. 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 $m = 3$, $n = 3$). Transformations of the plane. Translation, reflection, rotation, enlargement, shear. Composition of transformations. Invariant points and lines.

BIO 101: Biology for Physical Sciences (2, 0, 1) 3 Units

Scientific methods and the characteristics of living and non-living things. Cell and tissue biology. Elements of Biological chemistry and cellular metabolism. Taxonomy of living things, heredity and evolution. Elements of ecology and types of habitats.

GST 103: Humanities (1, 0, 0) 1 Unit

The nature and scope of economics. The Nigerian political system: policy and means of production in Nigeria. The structure of the Nigerian economy aspects of economics and technological dualism; internal migration – rural to urban migration and the informal sector. The role of capital growth and development; public investment criteria; choice of “Appropriate or relevant technology”. Human resources development in Nigeria – Labour utilization, education and manpower development and planning. Agricultural technology and green revolution and integrated rural development. Industrialization: role and types of industry, choice of techniques, import substitution, export expansion. The economic role of the government – government expenditure and taxation; the federal structure, fiscal federalism and revenue allocation to financial system. Problems of development planning and plan implementation in the federal system of Government. Prospects of the Nigerian economy

GST 108: Social Sciences I (1, 1, 0) 2 Units

Introduction: The nature and space of politics and economics. Definition of basic concept in economics and political science

Nigeria’s public sector: The political set up in Nigeria. The civil service structure, public investment and economic infrastructure. The economic role of government; government expenditures and revenues, fiscal federalism and revenue allocation.

Nigeria’s private Sector: The financial system in Nigeria. The role of the agricultural sector in the development process. The industrial sector and public investment in Nigeria. Human resources development and utilization in Nigeria, National development planning problems and prospects, aspects of economic and technological dualism. Political and Economic future. A global perspective of economic system and development; balance of payments, commercial policies of Nigeria and other developing countries. Economic integration; state and structure of economics of ECOWAS countries, the ECA and Economics Co-Operation in Africa.

Foreign Aid and Investments: The multinational corporations, technological transfer and technology dependence. Global inter dependence and the new international economic order. World economic crisis – energy and OPEC, food storage and armament.

ENG 103: Engineering Drawing I (0, 0, 1) 1 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.

ENG 101: Workshop Practice I (0, 0, 1) 1 Unit

General: Use of engineering measuring instruments, e.g. callipers, gauges etc. introduction to hand tools e.g. practice in wood planners, saws, sanders and pattern making; sampling and sizing techniques of raw materials.

Sheet metal work: Production of sheet metal products – layout, cutting and shaping, gas welding, soldering, brazing, fastening, assembly.

Wood work: Basic woodworking principles and tools – layout methods, cutting and shopping, finishing and evaluation, finished products.

ENG 102: Workshop Practice II (0, 0, 1) 1 Unit

Industrial Safety: Behaviour analysis, safety consciousness. Survey of sources of common accidents. Accidents prevention and control. Machine-shop work; lathe-work; Instruction of metal working process. Shaping, milling, grinding, drilling and metal spinning etc., Design of simple jigs and fixtures.

Automobile Work: Simple automobile diagnosis and repairs.

ENG 104: Engineering Drawing II (0, 0, 1) 1 Unit

Guided sketching, free hand drawing, creative thinking, and multi-view representation. Revolution and conventional practice. Section and auxiliary views. Spatial relationships; basic descriptive geometry, vector geometry, developments and intersections, pictorial presentation.

FRN 101: French Language I (1, 0, 0) 1 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.

FRN 102: French Language II (1, 0, 0) 1 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 1. At the end of this course the students should be able to speak basic French and be able to tell the time in French.

**IGB 101: Introduction to Igbo Grammar, Composition and Comprehension (1, 0, 0)
1 Unit**

This course will equip the student with the basic skills; listening, speaking, reading and writing in approved 1961 orthography as the basics for standard Igbo.

IGB 102: Introduction to Igbo History, Culture and Literature (1, 0, 0) 1 Unit

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

200 LEVEL

BLD 201: Introduction to Building and Building Materials. (1, 1, 0) 2 Units

The design/building process; Types of contracts, and procedures; Types and procedures of tendering; Pre-contract planning principles; Design objectives (strength, serviceability, economy, etc); Summary of building regulations and statutory requirements; Preliminary works in building construction including site selection criteria, site investigation methods, site organizational layout and setting out operations.

History of the built environment; importance of building to society, classifications of buildings (with pictorial illustrations); evolution of techniques in building construction; architectural forms and members, description of basic materials, tools, equipment and machinery used in building, parts of building (with architectural illustrations); functions of the primary building elements.

Climatic condition, effects and the selection of construction materials. Specifications and standardization definition types and classification of materials. Materials testing, research and quality control. Materials structure and properties thermal and mechanical stresses of materials deformation and deterioration of materials. Effects of climatic conditions on materials. Criteria for selection of materials.

LAA/ARC 201: Introduction to Architecture (1, 0, 1) 2 Units

Basic Principles in Building/Architectural drawings, descriptive geometry, perspective and shades and shadows including freehand drawing. The course is aimed at developing graphic language skill, Manipulative skills in the use of technical ideas for visual technical drawings. Aptitude and facility in communication skills in design.

BLD 226/CSC 202: COMPUTER AIDED DESIGN (1, 1, 1) 3 Units

1. Graphic instruments
2. Introduction to building drawing
3. Lettering and dimensioning of objects in various positions
4. Scales plain scales, diagonal scales, comparative scales, vernier scales.
5. Geometric constructions construction of angles of different sizes, principles of tangency and blending arcs. Construction of regular polygons, loci-ellipse, parabola, hyperbola, cycloids, involute etc. mechanisms. Construction of arc in openings.
6. Developments

BLD 206: Building Workshop Practice (1, 0, 0) 1 Unit

Block laying and concreting tools and equipment; their uses and maintenance; relevant factory acts safety regulations; concrete materials; block and bricklaying; concreting; classes of timber and uses; wood joints; woodwork machines; painting and decoration; plumbing tools and equipment; electrical wiring and other systems for domestic usage; proprietary products.

BLD 213: Structural Mechanics I (1, 1, 0) 2 Units

Forces in a plane-concurrent, non-concurrent parallel; force systems in space; Free Body diagrams; fiction; kinematics of rigid bodies and particles; laws of motion and equilibrium; impulse; momentum etc.; centre of gravity; moment of inertia and other properties of sections.

BLD 214: Structural Mechanics II/Strength of Materials (2, 0, 1) 3 Units

Simple stresses; compatibility of strains; temperature stress; circular rings; shear and normal stresses; application of Mohr's circle; principle stresses and planes; bending moment and shear force relationships and diagrams; torsion of circular a section; stresses in beams; Euler critical loads for columns.

BLD 222: Structural Theory and Design I (1, 1, 1) 3 Units

Introduction and basic concepts; Loading and structural response; Space frames; stress analysis; Analysis of Trusses and resolutions using method of joints; method of sections; method of tension co-efficient; Bending Moment and shear force diagrams

BLD 202: Building and Construction Materials (1, 1, 0) 2 Units

Basic properties of materials – Physical Chemical and Mechanical properties. Production and processing of major construction materials-timber, Cement, Stones, Bricks, and other clay Products, Lime, Paint, etc. Concrete mixes and construction materials. Introduction to admixtures in concrete. Polymer and polymer concrete.

QST 203: Construction Measurement I (1, 0, 1) 2 Units

This course is an introduction to quantity surveying and the procedure for the measurement of building works. It deals with the following: introduction to the standard method of measurement of building works and a view of other standard method of measurement. They purpose, formats and parts of the bill of quantity. Applied measurement. Principles of measurement and description, taking off, squaring.

QST 204: Construction Measurement II (1, 1, 0) 2 Units

This is the first detailed study of the sections of the standard method of measurement of building works by considering a complete measurement of simple buildings and complex sub-structural work. It gives realistic examples that will enable the student to rapidly integrate in a professional office or contractor's office. Areas covered also include complex concrete framed buildings, building services, finishes and preliminaries.

EST 202: Environmental and Education Awareness (1, 0, 0) 1 Unit

Definition of Environmental science, ecological and psychological theory of participation; Environmental and needs of man. Interaction of man's needs, nature, culture and mature assets.

Knowledge of the natural environment; Sustainability and the basic resources air, water, energy, land and their significance to man, animal and plant; Environmental degradation and its impacts. Role of Education intervention in environmental action; Methods of dissemination of Environmental information; Case studies of information dissemination

to various target groups; Public opinion assessment; Social response to environmental changes by nature and mankind compensation.

MTH 202: Mathematical Methods II (2, 1, 0) 3 Units

Prerequisites: MTH 101 & MTH 102

Vectors: Product of vectors. Equations of lines and planes. Vector spaces. Linear dependence and independence. Basics and dimension. Linear transformation, matrices. Operations on matrices. Rank of matrix. Determinants. Inverse of a matrix. Solutions of systems of linear equations. Cramer's rule. Eigenvalues and eigenvectors. Similarity to diagonal matrices. Bilinear and quadratic forms. Applications.

MTH 203: Elementary Differential Equations (2, 1, 0) 3 Units

Pre-requisites: MTH 101 and 102

Derivation of equations from Physics, chemistry, Biology, Geometry etc. First order equations. Applications of first order equations. Second order linear equations. Fundamental solutions. Linear dependence and independence. Wronskian. Properties of solutions of linear equations. Methods of undetermined coefficient and variation of parameters. Application of second order linear equations. General theory of nth order linear equations. Laplace transforms. Convolution. Solution of initial – value problem by Laplace transform method. Difference equations

GST 201: Social Science II (1, 0, 0) 1 Unit

Concept and meaning of development; traditional African – its geographical and ethnographical review, its family structure, kinship system etc., socio-economic pre-occupation, political system, art and music, modes of communication; African and processes of modernization-education, writing and the press, urbanization and social change, modern trends in the art and aesthetic, nationalism and cultural review mass media and national development.

CSC 201: Computers and Applications I (2, 1, 1) 4 Units

Pre-requisites: MTH 101 and 102

Introduction to digital computers, their use and modern programming techniques; Brief history of computers, generation of computers, structure of a general purpose computer. General problem solving, systematic development of algorithms, flow diagrams, meaning of logical processes, analysis of computational problems, coding of programs, verification and validation of programs.

Practical Experience: Opening computers and peripheral equipment. Extensive proactive with one or more higher-level languages. Emphasis on technical applications. Elementary numerical algorithms.

STA 211: Introduction to Statistics and Probability (2, 1, 0) 3 Units

Pre-requisites: MTH 101 and MTH 102

Frequency distribution, measures of location and dispersion in simple and grouped data. Laws of probability. The binomial, Poisson and normal distributions. Estimation and tests of hypothesis. Analysis of variance and covariance, simple regression and correlation, contingency tables and χ^2 – applications

BLD 202: Building Construction and Materials (1, 1, 0) 2 Units

Site operations, General introduction to basic building, construction, operations and Techniques. Basic materials and components – Regional variations. Elements of Building – Foundation, floors, walls, roofs.

Detailing of elements of Building of all types – Residential, Industrial, Commercial etc. Sub-soils and conditions. Non-load bearing and load bearing walls. Types of floors and roofs. Drainage, External Works and landscaping.

Detailed study of materials and their performance in construction. Processing of building materials, current bye laws, specifications, Builders tools and equipment, soil explanations.

BLD 228: Building Materials Science (1, 1, 0) 2 Units

Non-ferrous Engineering alloys and their properties. Mechanical properties of Engineering Materials: Plastic deformation of the single crystal, stress and strain curves, strain hardening; creep, toughness and fatigue hardness. Principles of mechanical testing, mechanism of ductile-brittle transition in fracture and ITT curves. Physical properties of materials – electrical, optical and magnetic properties. Electronic structure and properties. Non-metallic materials. Ceramics, structures, properties and processions, application.

Plastic types structures, processing and applications. Composites – types and properties. Wood as an Engineering material. Environmental stability of engineering materials; corrosion types and control; Thermal degradation of polymers, dissolution and swelling, radiation damage.

Laboratory: Loading modes in tension, compression, torsion and bending. Mechanical testing of materials, ITT determination using charpy, 120cl, Hardness tests particle sizing and compaction of powders. Ductile and brittle behaviour.

300 LEVEL

BLD 334: Building Drawings (1, 0, 1) 2 Units

Conventions – symmetry, enlarged part views; Repetitive information, specification and detailing; Fundamentals of architectural drawings; Application of first and third angle projections. Pictorial drawings – isometric projections, shadows and images. Sectional views of buildings- full sections, half sections, off-set sections, alignment, broken-out or local sections and views, etc.

BLD 313: CONSTRUCTION TECHNOLOGY I (2, 0, 0) 2 Units

Basic principles in building production. Construction processes and methods. Earthworks in Building production. Construction plants and equipment. Materials handling and transportation. Basic methods in concreting, preparation, transportation and casting. Building systems in monolithic and prefabricated construction.

BLD 324: CONSTRUCTION TECHNOLOGY II (1, 0, 1) 2 Units

Basic principles in the construction of site services; access roads and drainages. Road structures and treatments. Horizontal and vertical alignments of access roads. Pavements to access roads; water production and distribution. Electricity supply and distributions on sites; Connection and networking to national grid.

BLD 325: Building Maintenance I (2, 0, 0) 2 Units

Building maintenance technology. Decay of building-agencies involved; alterations, conversions, extensions and general improvement of building-dimensional considerations; design defects and remedies; building surveys. Maintenance of all types of mechanical services in building.

BLD 326: Building Maintenance II (1, 0, 1) 2 Units

Building maintenance management. Maintenance cycles for different types of buildings; standard expected of buildings deviation spot. Planning maintenance resource required; programming, execution, appraisal and policy guide lines. Cost control of maintenance operation.

BLD 311: Building Services and Equipment I (2, 0, 0) 2 Units

Services and their equipment; lifts; escalations, Hoists; telephones; metering system designs, Fire protection in Buildings, fire-fighting equipment; economic valuation; service maintenance; cost control and management; water, gas and electrical services; installation, sizing and distribution. Basic concepts of electrical wiring, Sewage treatment and disposal

BLD 318: Building Services and Equipment II (1, 0, 1) 2 Units

Water supply prospecting, purification and storage; distribution to communicates for their domestic, industrial and commercial needs; relevant bye-law requirements; drainage including roof drainages; sewage and sewerage; principles of fire-fighting and associated equipment including by-law; regulations and codes affecting utility services. Sewage treatment and disposal

BLD 321: Structural Theory and Design II (2, 0, 1) 3 Units

Classification of structures as determinate or indeterminate; framed structures; types of support and joints in framed structures; types of support and joints in framed structures Equilibrium and determinacy, Determinate Structures; Analytical and graphical methods for the determination of the external reactions and forces in the member of plane frames and simple space frames. Deflection by direct integration. Macaulay's method and Williot-Mohr diagram; moment area method.

Indeterminate structures moment area method; three moment distribution method. Influence lines, energy principles and Castigliano's theorems; strain; energy; simple principles of virtual work; resolution of simple portal frame; arches, cables-theory and design.

BLD 323/ENG 209: Engineering Thermodynamics (2, 0, 1) 3 Units

Definition of essential terms and general concepts; first and second law of thermodynamics, applications to open system, heat engines, entropy; first and second law combined. Perfect gases. Joule Thompson co-efficient Equilibrium processes. Maxwell's relations in two phase system thermodynamic. Function of solution P-V-T relationship. Work from heat energy – refrigeration. General heat calculation in buildings.

BLD 327: Fire Engineering (1, 1, 0) 2 Units

Prescriptive and Performance based approach to fire safety in Buildings. Requirements for design and construction using the Approved document B. Flash over conditions. Calculations on Available and Required safe escape times (ASET and RSET), Lumped

mass method for fire protection of steel sections; Effect of end restraints on load bearing structural members under fire; Tensile Membrane action of end restraints of beams on slabs; Fire tests; Concept of Time equivalence; Conductive, Convective and Radiative heat transfer in buildings. Serviceability limit state design (SLS) for fire protection using Eurocode 2 (EN1991) and BS8110.

BLD 305: Traditional Housing Design (1, 0, 0) 1 Unit

The concept of Housing. Housing needs – man's needs for shelter. Housing demand and supply – the Nigerian Situation. Housing standards – Design layout and different methods of formulating housing standards for developing countries. Housing finance methods of financing housing – public, private (including speculative) and co-operative sectors. Housing infrastructure, Housing renewal – goals, principles methods and problems, socio-economic aspects of housing in Nigeria. Appraisal of existing housing policy.

BLD 322: Reinforced Concrete Structures (2, 0, 1) 3 Units

Design considerations; load analysis, concrete and reinforced concrete; steel reinforcement; permissible stresses; functions of a structure; simple load transmission examples; elastic and ultimate load theories. Structural elements single reinforced beams; slabs spanning in one direction; shear and bond; doubly reinforced beams; GT and L beams; axially loaded columns. Use of CP 110, BS 8110 and EuroCode.

BLD 302: Soil Mechanics and Foundations (1, 0, 1) 2 Units

Introduction to soil formation; identification and classification of soils; particle size distribution and analysis; consistency limits liquid limits; shrinkage limits, plasticity densities; phase relations, permeability and its measurement; strength and deformation of soil in building structures.

Compaction of soils; stabilization of soils; bearing capacity; deep and shallow foundations; use of Mohr's circle in soil studies. Passive and active pressures on slopes. Foundation depths and stresses.

Flow nets, soil freezing; consolidation and settlement; stresses in soils; excavations; cofferdams; bracing and strutting, dewatering of excavations and foundation sites. Shore protection and sheet piling.

BLD 320: Building Production Management I (1, 0, 1) 2 Units

Building production procedures and practices which facilitate high productivity on the building site; techniques in project management; clients, consultants and contractors' managerial staff relations; co-ordinations of efforts of designers, sub-contractors etc with the construction process; setting out production targets and incentives; the role of mechanical plants in construction project management.

EST 325: Environmental Impact Assessment (1, 0, 1) 2 Units

Different methods of assessing the impact of proposed development in the existing physical, social economic and technological frameworks.

EST 211: Fundamental Surveying (1, 0, 1) 2 Units

Types of surveys

Survey Instruments

Measurement of distances and bearing

Levelling

Use of Theodolite

Introduction to Remote Sensing (Photogrammetry)

BLD 301: Budgeting and Finance in Building (1, 0, 0) 1 Unit

Types of Budgets; Need for Budgets

Cash budget, Preparation of cash budgets – Capital expenditure. Budget evaluation of capital expenditure. Expenditure Budgets, Master Budget; Types of project finance; Working capital management, Determinants of working capital requirements of a project. Special project financing methods; Long term sources of finance, medium and short term sources. Inventory management and control; Break even analysis; Leasing – Lease or buy decisions.

Introduction to forms of Business organisation and accounting requirement; Accounting theory, cost accounting and purposes of accounting. Finance in general

Budgeting, control systems and capital budgeting, cost control. Working capital. Profitability. Case studies

BLD 312: Project Planning and Control (1, 0, 1) 2 Units

This course deals with the sequence, organization and control of projects and the responsibility of various groups on the implementation of capital projects. Management principles and practices are briefly covered.

Introduction to work study productivity and financial implication, Legal implications etc.

BLD 314: Building Regulations, Laws and Control (1, 0, 1) 2 Units

Application of planning laws in building development. The provisions and functions of the development and building control. The need for obtaining building permit.

Zoning laws. Duties of Building control officers. Analysis of the provisions of building regulations and bye laws in building delivery, Health, Safety and welfare of building users as provided by the building regulation. Monitoring construction processes using the provision of form certificate of fitness for human habitation pre and during building construction.

BLD 316: Plastics in Building (1, 0, 1) 2 Units

Introduction to plastic technology and Manufacture

Utilization of Plastics in Buildings

Performance of plastics in Buildings

Maintenance aspects, problems

Case studies

ENS 301: Introduction to Entrepreneurship and Innovation (2, 0, 0) 2 Units

This course is an introductory course for studying Entrepreneurship for the first time. The design and flow of the course are aimed at creating awareness and providing the knowledge and skills that are important in achieving success in human endeavours as a value addition to the student's chosen field of specification. The course outline is made up of thirteen topics

Development Entrepreneurship/Intrepreneurship

The Nigerian Entrepreneurship Environment

Creativity and intellectual rights

Technological Entrepreneurship

Innovation: Theories and Management

Family Business and succession planning

Women Entrepreneurship

Social Entrepreneurship

Business Opportunity set and Evaluation

Introduction to business Strategy

Introduction to Business Ethics and Corporate Governance

Relationship between scientific Research, innovation and products

Product Invention, Timeliness and processes.

ENS 302: Business Creation, Growth and Corporate Governance (2, 0, 0) 2 Units

The aim of this course is to develop student's competence and confidence in creating viable businesses with high potentials for new value addition and commensurate actions. The course is designed to enable students achieve economic independence after graduation. Its main objectives are to help change students' mindset towards paid jobs and over dependence on families and government.

Marketing mix; Product development and management; Ethics and Social responsibility and their relevance in business; Ethical behaviour; Business ethics and Practices in Nigeria; Case studies; community development projects/welfare; New opportunities for expansion; E-business; E-commerce; E-learning; Decision Making and control, Employee decisions.

Basic financial literacy; Business strategy; The concept of strategy and strategic issues in business (existing and start up). The scientist/Engineer as an entrepreneur; opportunities and challenges. Venture creation and elements of risk management.

400 LEVEL

BLD 401: Building Economics (2, 0, 0) 2 Units

Fundamental concepts of the economics of the building industry demand and supply, factors affecting demand and supply. Political, social and economic policies affecting the industry; application of basic economic concepts to the solution of economic problems of the building industry, etc.

BLD 403: Building Production Management II (2, 0, 0) 2 Units

Advanced Building production Management and procedures; Buildability and Maintainability analysis. Advanced Project Management techniques and Procedures; Management of Project Deliverables and their effect on Construction Project Management.

BLD 421: Construction Management (1, 1, 1) 3 Units

Management principles and practice generally; types of business organization and their statutory requirements; strategic planning and control; construction processes; construction trades; and work-study and measurement. Optimal composition of the work team; transportation problem in the construction industry; forms and methods communications; monitoring and progress reporting.

The basic principles of construction project planning, scheduling and control. Network scheduling techniques, the application and uses of CPM, PERT, Bar-chart, etc. in

construction projects. Introduction to work study and work measurement in productivity studies; financial and legal implications of time and cost over-run etc.

BLD 423: BUILDING RESEARCH METHODS (1, 1, 0) 2 Units

The course aims at giving the student an opportunity to develop relevant research techniques and writing skills. It incorporates the use of elementary statistical tools in the analysis of problems; principles or technical report writing. Project writing and presentation.

BLD 405: INTEGRATED BUILDING STUDIO (0, 0, 3) 3 Units

An integrated studio work to unify the entire course work offered for the programme. It includes production of sketch designs, structural design, estimates, construction, scheduling, etc. Production of Building production documents. This work is undertaken against a time frame.

BLD 417: Structural Theory and Design III (1, 0, 1) 2 Units

Structural analysis of deflections and other structural characteristics using methods of matrix algebra/stiffness. Analysis of plane frame; design of shells domes, folded plate structures etc.

Plastic Analysis; Uniqueness, upper bound and lower bound theorems; collapse mechanisms of frames; Affine Transformations; Yield Line Analysis of slabs.

BLD 413/ENG 405: CONTRACT LAW AND TORT/MANAGEMENT (2, 0, 0) 2 Units

Types of contracts, formation of a contract, elements of a valid contract; vitiation of a contract: discharge of a contract and forms of contract. Third parties rights and responsibilities industrial legislation, trade unions, J. C. T. forms of contract and other comparative forms of contract. Building and civil engineering claims. Highway, nuisances, obstruction, demolition, rights of the public and adjacent owners.

SIW 400: INDUSTRIAL TRAINING (SIWES) (2, 0, 4) 6 Units

A supervised students' industrial work experience scheme. The course is designed to give student sufficient exposure to the realities of the construction industry from field experience. Students are placed in training jobs involving building construction and management related activities. The course extends to the end of the long vocation and incorporates both SIW 200 and SIW 300. Students produce a report of the experience at the end of the programme. Each students his report and experience before a properly constituted departmental forum.

BLD 409: Construction and Building Safety (1, 0, 1) 2 Units

Introduction to safety; health and welfare on construction sites; role of construction workers, employers, management and their representatives in creation of safe and health working conditions; safety organization and management in a construction site; objectives of safety management; safety organization, safety plan; Excavations, accidents, safety precautions, inspection, edges, vehicles, access, lighting, buried or underground services

URP 411: Pollution Control and Management (1, 0, 1) 2 Units

The concept and meaning of pollution and control; Kinds of environmental pollution. The nature of pollutants. The effect of pollution on 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 pollution control within Nigeria and elsewhere; prevention, environmental protection, land use, zoning control, open green space control, supervision of physical planning projects

URP 315: Rural Development Planning and Basic Infrastructure (1, 0, 1) 2 Units

The village as an organic entity, rural urban complimentary function, the rural urban confinement. Physical, social and economic structure of a village; migration and rural population dynamics, problems of migration, loss of cultivable land to urbanization, flooding, water logging and erosion; lack of utilities and services; poverty and distress;

need for forestation; soil conservation and wild life preservation; transhumance; accessibility of villages; inter village communication.

Village communities in Nigeria: types and structure, rural planning relation to national and regional policies, basic principles of community development, community development in relation to rural, planning and housing; self-help techniques, role of voluntary organizations in community development, delineation of rural areas for planning purposes, rural population and settlement form, structure and function in different cultural zones in Nigeria (with case studies in various major zones and detailed studies of the location of planning school area), factors affecting the site and location of rural settlement; accessibility of villages, communications, village planning; principles, concepts and standards; institutional basis for planning rural settlements; village regrouping; model village and settlement planning (with local examples), planning and provision of rural facilities, rural transportation and land use planning, social, human, resources and technological, agricultural problems of rural areas.

QST 221: Principles of Estimating (1, 0, 0) 1 Unit

Definitions of Tendering in Construction industry, purpose of tendering, tendering processes, methods of tendering/procurement, open tendering, selective tendering, negotiated tendering, All-in service, lump sum and package deal clients and/or contractor objectives and responsibilities, outline of the contractor's tender including the duties of the estimator.

Introduction to their effect on cost. Types of contractor for which tenders are required, purpose of associated documents, and their relevance of estimating.

Tender procedures, major factors affecting cost e.g. method of constituents a rate, materials, labour, plant, overheads, and profits. The all-in-rate, direct and indirect labour cost. Analysis and synthesis of rates for mechanical plants, and excavations.

QST 423: Project Planning and Cost Control (1, 0, 1) 2 Units

This course deals with the sequence, organization and control of projects and the responsibility of various groups on the implementation of capital projects. Management principles and practices are briefly covered. Also is the introduction to work study, productivity and financial implication, legal implication, ETC.

500 LEVEL

BLD 501: PROEJCT THESIS I (0, 0, 3) 3 Units

BLD 502: PROEJCT THESIS II (0, 0, 3) 3 Units

Each student is expected to work on an independent project involving practical and scientific investigations. The report may end at analysis and report stage or extend to a design solution as may be required. The course is graded at the end of the session.

BLD 503: Advanced Construction Technology I (1, 0, 1) 2 Units

Complex contemporary buildings and construction problems; evaluation of alternative forms, performance of structural systems and building envelope; industrialized systems building versus traditional solution, standardization, quality control and dimensional accuracies in building; proprietary system in buildings; mechanical and electrical system and installations; mechanical plants on site.

BLD 505: Project Management Principles (2, 0, 0) 2 Units

The practice of project management as a direct service to clients on an in-house of consultancy basis. Analysis of management thoughts; the use of electronics computers in feasibility analysis and design, execution and management of building projects, including financial marketing of construction projects.

QST 321: Estimating and Price Analysis I (2, 0, 1) 3 Units

PRE-REQUISITE: QST 221

This course deals with detailed analysis; showing the basis upon which prices, of bills of quantities items are compiled. It also includes contractor's estimates and analysis of contractor's tenders.

QST 322: Estimating and Price Analysis II (2, 0, 0) 2 Units

PRE-REQUISITE: QST 221

Sources of information for pricing. Approximate method of estimating and introduction to standard schedule of prices. Build-up of labour rates. Estimating for complex building

SVG 317/451: Geographic Information System (GIS) (1, 0, 1) 2 Units

Linkage of all data In Geographic Information system by location so that any one features of an area can be put alongside its other features. How to use better spatial information to foster economic growth and to protect the environment. The creation of multi-purpose urban information system to improve the planning information base. Social economic purpose of the system such as demographic analysis and the development of structure plans e.g. for the delineation of school distinct, the assessment of population changes over age group and the review of capital and revenue allocation.

BLD 504: Productivity Studies on Site (1, 0, 1) 2 Units

The course is aimed at increasing productivity of building construction by analysing typical methods of construction and production processes

Work study flow charts – principles and techniques. Case studies

BLD 506: Management of Building Projects (1, 0, 1) 2 Units

This course deals with building production processes and practices, which facilitate high productivity on the building site, Techniques of Project Management, Clients, Consultants and contractors, Managerial staff relations.

Co-ordination of efforts of designers, sub-contractors etc. with the construction process.

Productivity, production targets and incentives

The role of mechanical plants in construction projects management.

QST 427: BIDDING, TENDERING AND STRATEGIES (2, 0, 0) 2 Units

Analysis and synthesis of rates of the following areas: concrete work, brick and block works, roofing work, metal work and structural steel work, Plaster work and rendering, painting and decoration.

BLD 508: Advanced Building Production/Process (1, 0, 1) 2 Units

The course deals with building production procedures and practices which facilitate high productivity on the building site and quality product:

Preparation of production management document: Construction programme, Health and safety plan, Quality Management Plan and others

Implementation of builders' production documents

Clients, consultants and contractors' managerial staff relations

Co-ordination of efforts of designers' sub-contractors etc. with the construction process

Productivity, production targets and incentive

Understanding and managing the production process

Preparation of site reports

Preparation of stage completion certificates

Insurance Act and professional practice in the Building Industry

Insurance Act and the professional Builder.

BLD 510: Specification Writing (2, 0, 0) 2 Units

Designed to give students a practical approach to the specification of building materials and components, Introduction to specification writing, Essentials of specification writing, Sources of information for specification writing, Presentation of specification materials, Types of specification and use of standard codes, SMM as aid to specification writing, Sample specification and items description in the BOQ presentation for building works,

Excavation and Earthwork, Concrete and Earthwork, Concrete steelwork, Structural steelwork, Electrical installation.

BLD 511: Reinforced Concrete Design II (2, 0, 0) 2 Units

BS8110 and Eurocode2 design of two way reinforced slabs; combined bending and direct stresses; footings; staircases; retaining walls; water tanks; complete design exercise of a duplex building including structural drawings and the bar bending schedule; Torsion; Bond Stress; Anchorage; Ferro-cements; Serviceability requirements – Crack width calculations. Introduction to the use of RC design softwares (CSC Orion, Revit, CALCRETE, etc)

BLD 512: DESIGN OF STEEL STRUCTURES (2, 0, 1) 3 Units

Introduction to steel structures; production and properties of steel; elementary principles of bolted, riveted and welded connections; design of beams; plate girders; compression members; tension members; calculation of roof and bridge trusses; design of column bases and foundations. Composite action and effects of shear studs

BLD 513: Professional Practice and Procedures (2, 1, 0) 3 Units

Principles of good practice by professional builders in relation to other sister professions and the interest of clients and the public. The NIOB rules of professional practice; the registration Boards and their regulations; Joint Consultative Council; SIWES programmes; partnerships and consortia; design and building paradigm; roles of professional builders; tendering and bidding strategies; consultancy practices and their regulations; etc. code of ethics.

BLD 515: Building Materials Development (2, 0, 0) 2 Units

The course is designed to focus attention on research & development of new building materials

A review of current production processes of typical building materials

Adaptation of existing processes for new building materials

New building materials from local resources

Quality control, Agreement and Quality Assurance

Case studies

BLD 516: Pre-stressed Concrete Design (2, 0, 0) 2 Units

Materials for pre-stressed concrete structures. Pre-stressing system, end anchorages. Loss of pre-stressed, friction. Analysis of sections of flexure. Design of sections for flexure. Shear bond, bearing, camber, reflections, and cable layouts. Partial pre-stressed and non-pre-stressing, compression members, piles, economics.

BLD 518/STE 504: Design of Timber structures (1, 0, 1) 2 Units

Timber Design: Fibre stress at proportional limit; Modules of rupture; Modulus of elasticity. Impact stress as proportional limit. Nails spikes; common wood screws, lag screws, Bolts, drift pins and drift bolts; Timber connections; Extreme fibre stress in bending, Depth factor, form factor, Horizontal shear in wood beams, Lateral deflection of wood beams. Trussed beams. Simple solid wood columns, space columns.

Framework economy in the design of a concrete structure. Economy in formwork and the sizes of columns. Economy of formwork and the sizes of concrete beams. Economy in making, erecting and stripping forms. Pressure of concrete of formwork. The effect of the rate of placing concrete on pressure. The effect of concrete mix, temperature, consistency, methods of consolidating concrete on pressure.

Properties of lumber. Allowable unit stresses in lumber. Properties of plywood, hardwood, steel forms, aluminium forms, plastic forms, Nails, withdrawal resistance of nails. Allowable working loads for multiple lumber connections. Equations used in forms design. Bending stress. Examples of Beam analysis for horizontal shear. Deflection of forms for concrete beams, Shores, Wood-shores, T Heads, two-tier wood shores. Wood towers, tests on x-braced type frames. Test on frame racking. Horizontal shearing stress. Bend analysis. Causes of Failure of formwork. Forces acting on vertical shores. The design of formwork to withstand dynamic forces. Forms for footing and foundations.

BLD 520: Advanced Construction Technology II (1, 0, 1) 2 Units

Advanced system of building, highlighting innovations and technological perspectives; system of prefabrication; industrialized construction of high rise buildings. Specialized topic in construction technology, including underpinning; dewatering of excavation

construction of deep foundations; cofferdams; pilling system; pile driving, etc. Soil stabilization methods; case studies on structural failures and remedial works.

BLD 521: Construction Plant and Equipment (1, 0, 1) 2 Units

Course deals with the plant and equipment in use on construction site. Management of plant excavation equipment, earth-moving plant, selection of plant and equipment, concreting plant, Building cranes, conveyors, deviation and Hoist scaffolding, power hand tools, pumps and plant safety.

BLD 522: Building Contracts, Law and Arbitration (2, 0, 0) 2 Units

Formation of Building Contracts, distinction between tendering procedures and contractual arrangements. Types of contract – Lump sum schedule, contractor's obligations, quality control and protection of employer. Bankruptcy, arbitration procedure and practices.

BLD 523: Building Services – Problems in Solar Energy in Buildings (1, 0, 1) 2 Units

Solar Energy and Building Estimate of Conventional fuel resources used in Buildings

Availability of solar energy, thermal solar collector types, solar collector performance; solar and conditioning and passive energy conservation techniques in building design.

CONTROL: Analogue and digital control systems with advantages and disadvantages. Energy management techniques security systems hand specification.

Utilities: Fire and the building – Design, control and fighting.