COURSE DESCRIPTIONS

TABLE 3.1: First semester 100 level Building Courses

Course Code	Course Title	L	T	P	Units	Status
MTH 101	General Mathematics I	2	1	0	3	C
PHY 101	General Physics I	2	0	3	3	C
CHE 101	Physical Chemistry	3	0	0	3	C
BLD 101	Building Construction & Materials I	1	0	3	2	C
ARC 101	Graphic Communication I	1	0	3	2	C
EVM 101	Intro. to the Built Environment	2	0	0	2	C
GNS 103	People, Culture & Social Issues	1	0	3	2	C
GNS 101	Use of English	2	0	0	2	C
SVY 101	Surveying I	2	0	0	2	C
Total		16	1	12	21	

TABLE 3.2 Second semester 100 level Building Courses

Course Code	Course Title	L	T	P	Units	Status
MTH 102	General Mathematics II	2	1	0	3	C
PHY 102	General Physics II	2	0	3	3	C
BLD 102	Building Construction & Materials II	1	0	3	2	C
ARC 102	Graphic Communication II	1	0	3	2	C
ESM 101	Introduction to Real Estate and Valuation	2	0	0	2	C
GNS 104	Basic Computer Applications	1	0	3	2	C
GNS 102	Use of English II	2	0	0	2	C
SVY 102	Surveying II	2	0	0	2	C
QTS 102	Intro. To Quantity Surveying	2	0	0	2	C

Total Units		15	1	12	20	

TABLE 3.3: First semester 200 level Building Courses

Course Code	Course Title	L	T	P	Units	Status
BLD 201	Building Construction and Materials III	1	1	3	2	C
BLD 203	Building & Architectural Services I (Noise Control & Acoustics)	1	0	3	2	C
BLD 207	Engineering Mechanics I	1	0	3	2	C
BLD 205	Workshop Practice I	0	0	3	1	C
QTS 201	Principles of Measurement & Description I	1	1	3	3	C
QTS 203	Tendering & Estimating I	1	0	3	2	C
GNS 201	History & Philosophy of Science	2	0	0	2	C
ARC 210	Building Studio & Computer Aided Design	1	0	3	2	C
QTS 205	Building Economics	2	0	0	2	C
MTH 201	Mathematics	2	1	0	3	C
Total		12	3	21	21	

TABLE 3:4 Second semester 200 level Building Courses

Course Code	Course Title	L	T	P	Units	Status
BLD 202	Building Construction & Materials IV	1	1	3	2	C
BLD 204	Business Organization & Methods	1	0	3	2	C
BLD 206	Workshop Practice II	0	0	3	1	C
BLD 208	Building Studio II	0	0	3	1	C
BLD 210	Environmental Services (Lighting)	1	0	3	2	C
QTS 202	Principles of Measurement & Description II	1	1	3	3	C
BLD 220	Strength & Testing of Materials	2	0	3	3	C
GNS 202	Political History & Governance in Nigeria	2	0	3	3	C

QTS 204	Tendering & Estimating II	2	0	0	2	C
Total		10	2	21	19	

TABLE 3.5: First semester 300 level Building Courses

Course Code	Course Title	L	T	P	Units	Status
BLD 301	Construction Technology	1	1	3	3	C
BLD 303	Building Maintenance I	1	0	3	2	C
BLD 305	Building Services (Water and Drainage)	1	0	3	2	C
BLD 307	Structural Analysis I	2	0	3	3	C
BLD 309	Engineering Thermodynamics	1	0	3	2	C
STA 101	Basic Statistics	2	1	0	3	C
GNS 301	Entrepreneurial Skills	2	0	0	2	C
GNS 203	Introduction to French I				2	C
QTS 301	Measurement of Construction Works I	1	0	3	2	C
Total		12	2	21	21	

TABLE 3.6: Second semester 300 level Building Courses

Course Code	Course Title	L	T	P	Units	Status
BLD 302	Construction Technology II	1	1	3	3	C
BLD 304	Building Maintenance II	1	0	3	2	C
BLD 306	Building Services (Air Conditioning)	1	0	3	2	C
BLD 308	Concrete Technology	2	0	0	2	C
BLD 310	Mechanics of Materials	2	1	0	3	C
BLD 312	Soil Mechanics I	2	0	3	3	C
BLD 314	Introduction to Suitable Buildings & Technologies	1	0	0	1	C

GNS 302	Entrepreneurial Skills	2	0	0	2	C
GNS 204	Introduction to French II	1	0	3	2	C
Total		**13**	**2**	**15**	**20**	

TABLE 3.7: First semester 400 level Building Courses

Course Code	Course Title	L	T	P	Units	Status
BLD 401	Integrated Studio	0	0	6	2	C
BLD 403	Principles of Construction Management	2	0	0	2	C
BLD 405	Properties of Construction Materials	0	0	3	3	C
BLD 407	Quality and Productivity Management	1	0	3	2	C
BLD 409	Building Laws, Regulations and Control	1	0	0	1	C
BLD 411	Building Services (Electrical Services)	1	1	0	2	C
BLD 413	Reinforced Concrete Design	2	0	0	2	C
BLD 415	Foundation Engineering I	2	1	0	3	C
ELECTIVES					**4**	**E**
TOTAL					**21**	
4 UNITS OF ELECTIVE FROM BELOW						
BLD 417	Environmental Engineering I	2	0	0	2	E
BLD 419	Traditional and Modern Building Materials	1	0	0	2	E
EVM 209	Rural Settlement Planning	2	0	0	2	E
EVM 210	Sociology of Housing	2	0	0	2	E
QTS 305	Construction Economics I	2	0	3	3	E

TABLE 3.8: Second semester 400 level Building Courses

Course Code	Course Title	L	T	P	Units	Status
BLD 402	SIWES for the Whole Semester				15	C
Total Units					15	

TABLE 3.9: First semester 500 level Building Courses

Course Code	Course Title	L	T	P	Units	Status
BLD 501	Advanced Construction Technology I	2	1	0	3	C
BLD 503	Building Production Management	1	1	0	2	C
BLD 505	Professional Practice	1	1	0	2	C
BLD 507	Project Report I	2	0	0	2	C
BLD 509	Technical Report Writing	1	1	0	2	C
BLD 511	Specification Writing	1	1	0	2	C
BLD 513	Budgeting and Finance	2	0	0	2	C
ELECTIVES					**4**	
TOTAL					**19**	
4 UNITS OF ELECTIVES FROM BELOW						
BLD 515	Transportation Engineering and Management	2	0	0	2	E
BLD 517	Design of Timber Structures	2	0	0	2	E
BLD 519	Foundation Engineering II	1	1	0	2	E
BLD 521	Soil Mechanics II	1	0	3	2	E
BLD 523	Property Management I	2	0	0	2	E
BLD 525	Thermal Environment	2	0	0	2	E

BLD 527	Information System & Management	2	0	0	2	E

TABLE 3.10: Second semester 500 level Building Courses

Course Code	Course Title	L	T	P	Units	Status
BLD 502	Advanced Construction Technology II	2	1	0	3	C
BLD 504	Construction plants and Equipment	1	1	0	2	C
BLD 506	Building Contract Law and Arbitration	1	1	0	2	C
BLD 508	Project Report II	2	0	0	2	C
					9	
ELECTIVES					**8**	
TOTAL					**17**	
8 UNITS OF ELECTIVES AT LEAST 6 UNITS ANY ONE OF FOUR (4) OPTIONS BELOW:						
i) CONSTRUCTION MANAGEMENT OPTION						
BLD 510	Health and Safety Practice on Sites	1	1	0	2	E
BLD 512	Advanced Building Production Process	1	1	0	2	E
BLD 514	System Analysis in Construction	2	0	0	2	E

BLD 516	Case Studies on Specific Construct management problems	1	1	0	2	E
BLD 518	Operation Research	1	1	0	2	E
ii) BUILDING MAINTENANCE MANAGEMENT OPTION:						
BLD 520	Building Maintenance Management	2	0	0	2	E
BLD 522	Design Economics and Cost Planning	2	0	0	2	E
BLD 524	Case Studies in Specific Building Maintenance	1	1	0	2	E
BLD 526	Fire Protection of Buildings	2	0	0	2	E
BLD 528	Property Management II	2	0	0	2	E
iii) STRUCTURES OPTION:						
BLD 530	Engineering Geology II	2	0	0	2	E
BLD 532	Reinforced Concrete Structure II	1	1	0	2	E
BLD 534	Analysis and Design of Steel Structure	1	1	0	2	E
BLD 536	Advance Design of Timber Structures	1	1	0	2	E
BLD 526	Fire Protection of Buildings	2	0	0	2	E
iv) BUILDING SERVICES OPTION:						
BLD 526	Fire Protection of Building	2	0	0	2	E
BLD 538	Energy Utilization in Building	2	0	0	2	E
BLD 540	Advance A/C and Transportation in Buildings	2	0	0	2	E
BLD 542	Advance Acoustics and Noise Control	2	0	0	2	E
BLD 544	Advance Lighting	1	1	0	2	E

SYNOPSIS OF COURSES TAUGHT IN THE BUILDING PROGRAM

BLD 101 Building Construction and Materials I

Functions and types of Buildings, Duties of a Professional Builder, relationship with other professionals in the Construction Industry; various practice options available in the Building Profession – Construction, Building Services, Construction Management, Building Maintenance, Building Structures

General introduction to Basic Building Construction Operations and Techniques.

Site operations – Site Clearance, bulk excavation trending. Main items of Plant:- backacter, face shovel, dragline, etc

Foundations - Simple strip, Sub-soil loading calculation, Materials for foundation construction,

Floors - Solid ground floors, Raised upper floors(Timber), Finishes.

Walls - Functional requirements, Stone walls, Block walls, Brick walls, Utilization of timber for walls, Bonding, Mortar Stone/Block Brick walls, Pointing, D.P.C. Arches.

2 units

BLD 102 Building Construction and Materials II

Doors/Windows - Types and Function

Roofs - Flat roofs, pitched roofs, other types, Finishes

Detailing of Building Elements - Foundation, nature of Subsoil, Floors, Walls section/openings, Roofs.

. 2 units

BLD 201 Building Construction and Materials III

Building Production Methods:- site selection, site exploration/investigation & Survey, types of sub-soil, site preparation, setting out of building works, Detailed study of materials and their use in construction. Building Bye-laws and their interpretation. Builders tools and equipment.

2 units

BLD 202 Building Construction and Materials IV

Detailing of construction works, Builder's drawings, shop drawings, Simple Functional details – single, contained, cantilever etc, Basement walls, retaining walls and heavy foundation, Ground floors and slabs and damp proof courses, upper floors, types of finishes, and relative merits and cost, Schedules of finishes, doors, windows etc. External cladding of Buildings, Development of new building materials – adaptations.

2 units

BLD 203 Building Services (Noise Control and Acoustics)

Nature of sound, sound pressure, intensity and power; The decibel measurement of sound: sounds level meters and weighting scales .

Transmission of sound and vibration in buildings. Transmission loss. Maximum acceptable noise levels. Means of noise and sound insulation, Room Acoustics, Room Acoustic criteria. Geometric design techniques. Sound absorbents. Case studies of some acoustical buildings.

2 Units

BLD 204 Business Organization and Account

The course exposes the students to the financial activities of construction Firms emphasizing the following:

The form of business organization ,The purpose and use of accounting for various Enterprises. Basic accounting theory and its application to construction and projects. Method of cost accounting and control
The financing of business organization. The interpretation company accounts

2 Units

BLD 205/ Workshop Practice I & II

BLD 206 Practical work in carpentry; Block laying, Plumbing, interior and exterior

Decorations. 1 Unit

BLD 207 Engineering Mechanic I

Introduction to structural mechanics and form. Free body diagram idealization; Equation of static equilibrium for coplanar and three dimensional force systems, graphyical methods of solution. Supports and conditions. Condition of equilibrium of simply supported beams, antilever, trusses etc. Resolution of forces – concurrent coplanar forces (triangle of forces, parallelogram of forces, rectangular components and polygon of forces) and – non concurrent coplanar forces (thee link polygon and its application). Moment of forces, measurement of moment, resultant of parallel forces and beam reactions. Description of statics – statically determinacy and indeterminacy (external and internal)

2 Units

BLD 208 Building Studio II

Introduction to sketch design for idea development of a single space function technology problem. Project development through systematic periodic introduction of several technical problems and the consequences for the final solution. Exploration of design decision and the consequence of those decisions on the organization and effectiveness of the construction processes. Interplay of spatial volumes, building materials and the technical, structural and detailing consequence.

1 Unit

BLD 210 Environmental Services (Lighting)

Nature of light. Basic units of measurement – luminous flux luminous. Elementary physiology of the eye, accommodation, adaptation, colour sensitivity, contrast sensitivity. Introduction to main criteria in lighting design – acuity, glare, modeling, appearance, costs etc.

Nature Lighting: Source of daylight; daylight factor; techniques Glare and control.

Artificial Lighting: Lumen design method; glare, colour rendering, colour appearance combining natural and artificial lighting survey of lamp types.

,2 Units

BLD 220 Strength & Testing of Materials

Proportion of structural sections – Areas, first and second moment of areas. Centre of gravity, neutral axis, section modulus (Elastics and Plastic) and radius of gyration. Stress and strain – tensile, compressive and transverse Hooke's law, Modulus of rigidity, elasticity, proportional and elastic limits, yield point, ultimate strength. Poisson's ratio, principal stresses. Stresses in composite members. Moments of inertia, stress concentration in bending, combined and direct stresses. Middle third rule..

3 Units

BLD 301 Building Construction Technology I

Floors: Functions, functional requirements, types of floors; factors that affect choice of floor types; design and construction of ground floor in concerete and timber.

Drainage: Functions; functional requirements; design principles; drainage systems. Factors affecting layout of domestic drain; storm water drains – principles of collection and disposal; building regulation concerning drainage.

External works: Estate roads; fence and boundary wall; gate and gate house; pavement and pathways.

Landscaping: Types of landscaping; factors affecting the design and construction of landscaping.

3 units

BLD 302 Building Construction Technology II

Foundation: Relationship between the super structure, artificial and natural foundation (sub-soil); deep strip foundation; stepped strip foundation; short bored pile.

Wall: Stone walling (random rubble, squared rubble, ashlar wall); timber frame walls (stud partition, framed wall construction, cladding to frames)

Roof: Two and three dimensional roof structures (roofs spanning 7.6m-24.4m); influence of plan shape and roof termination on construction; joint details; eaves treatment;

Temporary work: Formwork (design and construction); shoring; scaffolding; timbering to large excavation to include diaphragm walling.

3 units

BLD 303 Building Maintenance I

The course deals with Building maintenance technology Decay of buildings – Agencies involved. Design defects and remedies Alternations, Conversion, extension, improvements of Building including the necessary temporary supports. Access to components to be maintained, Maintenance of Building mechanical services, Equipment for building maintenance, Structural surveys of building and Schedules of dilapidation.

2 units

BLD 304 Building Maintenance II

The course deals with the management aspects of building maintenance.

Maintenance cycles – for different types of Buildings Optimising renewal cycles, Maintenance standards, Statutory requirements, Planning maintenance work: resources

required, cost control, Measurement of spot items and their pricing, Organisation of maintenance departments. Case study.

2 units

BLD 305 Building Services I (Water and Drainage)

Sources of water, water treatment; connection to main-service pipe; supplies to buildings where the mains pressure is insufficient water distribution in buildings; Demand and storage capacity; sizing of pipes and fittings; taps valves and materials for pipes. Design of internal drainage; sanitary appliances, sizing of waste and soil pipes. Drainage below ground; Planning design and construction. Roof and surface water drainage refuse storage and disposal Sewage disposal.

2 units

BLD 306 Building Services (Air conditioning)

Air/Vapour mixture, the psychrometric chart; Air conditioning processes; sensible cooling, cooling with dehumidification, heating, humidification.

Air conditioning systems:

Comfort conditions, room designs conditions, components functions, application of component; combinations, systems types, equipment location to facilitate performance, elimination of & vibration, condensate and heat, servicing and energy saving; control of air-conditioning systems.

Refrigeration

The first law of thermodynamics: flow equation, refrigeration as reversed heat engine cycle; working fluid, T-S diagram, refrigeration load.

Ventilation

Meaning of clean environment, air change rate, extract systems, exhaust hoods, fume cupboards pressurization and rarefaction of spaces of control direction of pollution flow. Application in operating theater, laboratories, garages and plant rooms.

2 Units

BLD 307 Structural Analysis I

1. **Introduction**
    - Definition of structure, buildings
    - Structural requirements for buildings

- Structural calculations: Analysis and Desin
- Structural Forms
- Types of Supports
- Types of Joints
- Loads and Types of Load on Structure
- Equilibrium and conditions of Equilibrium
- Determinate and indeterminate structures – conditions for Determinancy and indeterminancy

2. Analysis of Determinate Structures:
    - Truss – Method of Joints, Method of Section, Graphical Method, etc.
    - Beams – Bending moment and shear force diagram
    - Frames and Arch – bending moment, shear Forces, Axial Forces

3 units

BLD 308 Concrete Technology

Properties of concrete; types of aggregate and various tests on quality of aggregates; types of cement and their uses; various tests on soundness and quality of cement workability of concrete; mixing of concrete; On reinforcement and various types of formworks; strength of concrete, elasticity; density concrete; precast and pre-stressed concrete design.

2 units

BLD 309 Engineering Thermodynamics

Definition of essential terms and general concepts; first and second laws of thermodynamics – applications to open system; heat engines; entropy; first and second laws combined; perfect gasses; Joule Thompson coefficient equilibrium process; Maxwell's relations, two phase system Thermodynamics; functions of solution P-V=T relationship; heat exchange in buildings and heat transfer in building fabrics; conduction, convection; and radiation; temperate gradient; work from heat energy - Refrigeration

2 Units

BLD 310 Mechanics of Materials

Force moments, couples resultants and equivalent systems, Direct stresses and strains, Hooke's methods of superposition. Stresses and deformation resulting from temperature changes, stresses in thin cylinders and spheres. Stresses on rigid planes; principal stresses. Structural mechanics of statically determinate rigid body and plane pin jointed frames. Bending movement and shearing forces in beams. Simple bending theory. Torsion of

circular shafts and elastic of beams including determination by the Mohr's moment area principles.

3 Units

BLD 312 Soil Mechanics I

Soils: their classification, behavior etc., strength and deformation of soils; soil stresses; settlements and movements due to loading; geotechnical investigation and tests; soil stabilization; lowering ground water; biding agents and their effects/ properties.

3 Units

BLD 314 Introduction to Suitable Building & Technologies

Definition and concept of sustainability, Agenda 21 for sustainable construction, lean construction principles and technologies, green construction and technologies.

1 Unit

BLD 401 Integrated Studio Work

Group or individual/independent work on building in which students are expected to demonstrate proficiency in the design, development of services and structural computations. Students are to provide solutions to set assignment with adequate clarity and against a time frame.

2 units

BLD 402 SIWES FOR THE WHOLE SEMESTER 15 Units

BLD 403 Principles of Construction Management

The course deals with management Principles and practice generally; management science, organization theory and their application to building project.

Personal management, communication and communication systems, Introduction to decision theory, financial accounting, appraisal and control of capital project from conception to completion.

2 units

BLD 405 Properties of Construction Materials

Stones: Classification, characteristics, tests of stones, uses, deterioration etc.

Lime: Classification, manufacture, utilization etc.

Cement: Composition, manufacture, types, storage etc.

Aggregates: Classification, qualities etc.

Mortars: Uses, types, selection of mix etc,

Concrete: Concrete mixes, water cement ratio, work ability, placing, compaction, curling qualities of good concrete.

Bricks: Classification, sizes, manufacture etc

Timber: Definition, classification of trees, characteristics of good timbers, defects, seasoning, preservation, veneers, plywood, particle boards etc

Paints and varnishes: Classification, composition, characteristics, defect in painting.

Metals: Occurrences of iron, pig iron, cast iron, wrought iron, steel, rusting, corrosion and preservation of steel, uses of iron and steel.

Plastics: Properties, constituents, use in buildings

Glass: Principal constituents, manufacture classification, Rat, Bitumen and Asphalt.

3 units

BLD 407 Quality and Productivity Management

Development of a Quality Management policy for a project; site management responsibilities in Quality Management; inspection and testing of materials in construction processes; quality records;

Productivity Studies: Work study; method study; flow chart and string diagrams; target setting; evaluation and review.

2 units

BLD 409 Building Laws, Regulations & Control

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; the duties of Building Control Officers; Analysis of the provisions of the National Building code; Construction regulations and bye-laws in building delivery.

2 Unit

BLD 411 Building Services (Electrical Services)

Basic electrical theory and terms, generation and distribution of electricity, **Supply to industrial building:** Supply to small and residential buildings.

Supply controls and protection of installation: fuse and circuit breakers, switches and outlets

Cables and conduit: Cable type, conductor/cable rating; cable sizing

Circuits; sizes, rating and voltage drop; earthing;

Electricity distribution in small buildings, distribution in large tall buildings

Electricity supply regulations. Economics of Supply: Tariffs, load factor, power factor and power factor correction.

2 Units

BLD 413 Reinforced Concrete Design

1. **Introduction**
   - Goal of structural design
   - Methods of structural design
   - Comparison of old design codes with the current design code
2. **Limit State Design Method**
   - Concept
   - Properties of materials: Steel, concrete, etc.. Steel Types, Reinforcement Grades
   - Characteristic loads an characteristic strength
   - Design load and design strength
3. **Design and Detailing of Beams**
   - Flexural behavior
   - Beam Designs: Singly–Reinforced and Doubly-Reinforced Beams
   - Shears in Beam
   - Detailing of Beams
4. **Design of slabs in one-way, columns, Foundation**

2 Units

BLD 415 Foundation Engineering I

Soil exploration, sampling and in-situ techniques. Bearing capacity. Stress distribution settlement. Design of shallow and deep foundation including pile loading test. Lateral earth. Field trips to construction sites.

3 Units

BLD 417 Environmental Engineering I

Introduction:

- Definitions: Environment, Environmental Engineering
- The Impact of Human on the Environment
- The Improvement of Environment Quality
- The Role of Environmental Engineer

Water:

- Definitions, Characteristics, Hydraulic Cycle, Water Quality
- Quality Requirements
    - Biological Quality
    - Physical Quality Requirements
    - Biological Quality Requirements
- Engineered System for Purification
- Engineered System for Waste Water Treatment, Disposal.

Air:

- Air Pollution: Definition, Implications, Units of Measurements,
- Sources of Pollution
- Classification of Pollutants
- Air Management Concepts
- Effects of Air Pollution on Meteorological conditions
- Engineered system for air pollution control.

Solid Wastes

- Types of Solid, Sources and Properties of Solids
- Solid Waste Management
- Engineered System for solid Waste Management
- Engineered System for resource energy recovery

2 Units

BLD 419 Traditional & modern Building Materials

Clays in Buildings:

Clay as a basic product; clay products in buildings (foundation, floors, walls, ceilings, roofs, finishes); performance of clays in buildings; maintenance aspects; problems, case studies.

Plastic in Buildings:

Plastic technology and manufacture; utilization of plastic in buildings; performance of plastics in buildings; maintenance and problems; case studies.

Timber in Buildings:

Timber products in Buildings (floors, walls, ceiling, roofs, finishes, structural frame, performance and maintenance of timber in buildings)

2 Units

BLD 501 Advanced Construction Technology I

Upper floor Construction: R.C. suspended floor (Precast and in-situ); timber suspended; hollow pot floor; metal floors; ducts for services in colors;

Walls: Concrete box frames; cross wall construction, retaining wall;

Industrial and commercial doors and windows – revolving floors, sliding and folding doors, double glazed windows; metal doors and windows; aluminum windows;

Stairs and ramps: functions, functional requirements; building regulations on stairs;

Finishes: plastering; rendering, wall (tiling/mosaic); painting and decoration; floor finishing; proprietary systems: ceilings partitions, curtain walling, other wall claddings.

3 units

BLD 502 Advanced Construction Technology II

Industrialized building systems and their technology; selection of and evaluation against traditional solution, stages in prefabrication and industrialization.

Standardization, quality control, dimensional accuracy – installation or mechanical, electrical and refuse disposal systems;

Roofs and roof system for large space; Large basements; retaining walls; piling systems.

Case studies of current unique construction methods; concepts of intelligent buildings, building automation systems and technologies.

3 units

BLD 503 Building Production Management

This course focuses on building production procedures and practice, which facilitate high productivity on building site and quality product. Sets of architectural, structural, mechanical and electrical drawing will be available for analysis and extraction of production information required for project execution.

- Preparation of builder's production documents

- implementation of builder's production documents

- Clients, consultants and Contractor's staff relations

- Coordination of efforts of designers, sub-contractors, etc within the

  construction process

- Productivity, production target and incentive

- Understanding the managing of production process

- Preparation of site reports

- Preparation of stage completion certificates

2 units

BLD 504 Construction Plants and Equipment

Standard types of equipment and special equipment. Uses, function of construction equipment such as soil stabilization and compaction rollers, vibrators, tractors and releated equipment, scrapers, excavating equipment such as power shovels and backholes, shear legs and derrick tower cranes; gantry (portal) creane hoist; trucks and wagons belt-conveyor system, pile and pile-driving equipment and pumping equipment. The cost of owning and operating construction equipment. Depreciation costs, economics life of construction equipment, replacement and investment. Sources of construction equipment. Plant maintenance.

2 units

BLD 505 Professional Practices

The course deals with principles of good practices 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 its regulation
- Joint Consultative Council – SIWES Programmes
- Partnerships and consortia, Design and Build
- Roles of Professional Builders
- Tendering and bidding strategies
- Consultancy practices and their regulations
- The National Building code;
- Health and Safety Management in Construction

2 units

BLD 506 Building Contract Law and Arbitration

- Formation of building contracts – essentials, offer and acceptance implied terms, mistake, misrepresentation. Distinction between tendering procedures – and contractual arrangements. Contractual relationship between persons connected with building contract.

- Types of contract – lump sum, schedule, cost reimbursement. Selection of contractor – objectives and subjective criteria, time of appointment, Reasons for sub-contracting and nominating

- Contractor's obligation to carry out and complete the works

- Definition, substantial compliance, excuses for non-performance.

Time for completion – extension, distinction between penalties and liquidated damages.

- Variations to work – meaning of 'extra', work indispensably necessary; right to vary work, form of instruction, valuation of variations, entitlement to payment for extras ex gratia payments. Payment – types of certificates, purpose form and conclusiveness, recovery of payment in absence of certificate. Valuation of work executed, materials, fluctuations, amounts due to sub-contractors right to withhold payment.

- Quality control- provisions to ensure compliance in relation to workmanship and quality of materials, degree of supervision, liabilities of architect and clerk of works, quality control off site.

- Defects – liabilities of contractor; sub-contractors and suppliers

- warranties, exclusion clauses, tortuous liability, limitation of actions, nature of defects and maintenance clauses. Protection of employer in relation to:

Non-performance – retentions, bonds, sureties injury to persons and property-indemnities and insurance Third rights – strict liability bankruptcy and insolvency classes, statutory conditions. Death or incapacity of parties or person connected with contract,

Breach of contract – types of breach by employer and by contractor, remedies

Measures of damages, forfeiture clauses, specific performance injunctions,

Liabilities professional advisers.

Text Books

Law and Practice of Building contracts by D.Keating (Sweet. And MAzwell)

Building Contracts- A practical Guide by D. F. Turner, G. Godwin)

2 units

BLD 507/508 Projects Writing I & II

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. Course lasts a whole session.

2 + 2units

BLD 509 Technical Report Writing

Objectives

- To equip the student with skills to carry out various types of research in building technology and management
- To prepare and present research proposals
- To identify pitfalls in the style of presenting research report evaluation
- This will be on class assignments and a written examination

Course Outline

- Introduction to research, definition, nature of research, type of research design, identifying research need and problem, writing and evaluation of research proposals developing research questions or hypotheses
- How to conduct literature search – looking for materials primary and secondary sources, purpose of literature review, outlining, critical review. Data collection methods questionnaires, interview, observations, experiments and records; sampling techniques, reliability and validity
- Data presentation and analysis – statistical test, testing of hypotheses, drawing inference, tables and figures
- Writing research report – mechanics of presenting a report, evaluation of research report.

2 units

BLD 510 Health and Safety Practice on Sites

Objectives of safety plan; organisation's health and safety policy; Health and Safety Committee; duties of site, health and safety personnel, health and safety briefing on sites; site accommodation and welfare facilities; accident prevention and measures; first aid; protective clothing and equipment; erection and inspection of scaffolds; fire prevention and protection procedure; control of substances hazardous to health; health and safety training, health and safety records.

An office building must be designed and equipped so that occupants can exist promptly and safely in the event of an emergency as in a situation of fire outbreak.

Organisation responsibility with respect to fire safety

- All buildings to meet the fire safety requirements of the Building code.
- Organisations should have a documented fire safety plan for the quick exit of occupants. All buildings must be equipped with facilities that will:
    - Detect the presence of fire
    - Determine its location
    - Sound the fire alarm
    - Broadcast one or more pre-recorded messages throughout the building, instructing occupants where to go and what to do
- Above procedure should be put into practice during occasional fire drills
- A periodic audit of fire safety measures is essential.

Table 1 is an extract from a document of fire protection checklist. The comprehensive fire protection checklist can serve as an instrument for auditing fire safety of buildings at the design stage and when in use.

2units

BLD 511 Specification Writing

Definitions, reasons for specifications, required specification criteria, specification standards; Types of specifications, specification writing and production techniques; technical content; specification language; style and arrangement; types of specification sections; reference standards, product selection; specifying products from manufacturer's information; review of prepared specification document. 2 units

BLD 512 Advance Building Production Process

The course is designed to expose the students to advanced system of building by highlighting possibility now and future for example:

- Soil strengthening
- System of prefabrication
- Self Weathering applied finishes
- Jointless flooring 2 units

BLD 513 Budgeting and Finance

- Introduction to form of Business Organisations and Accounting requirements
- Accounting Theory, Cost Accounting and Purpose andAccounting
- Finance in General
- Budgeting, Control System and Capital Budgeting, Cost Control
- Working Capital
- Profitability, Case Studies. 2 units

BLD 514 System analysis in Construction

System approach to planning; design and operation of large scale Physicalsystem;

economic and Building concepts; linear programming;

Network and decision analyze; concepts of problem formulation, synthesis and analysis. Application to building and construction problems. Optimization

2 units

BLD 515 Transportation Engineering and Management

Introduction to transportation engineering, Design and location of highway, design controls and criteria elements of design, fundamentals of traffic engineering. Airport plan and layout, aircraft data related to airport classification and design, design standards.

2 Units

BLD 516 Case Studies in Specific Construction Management Problems

This course is an independent work of student using existing methods or new approach to propose solutions to construction management problems.

2 units

BLD 517 Design of Timber Structures

- Introduction of structural timber. History of timber houses; beams roof construction etc. Structural timber today.
- Properties of timber and wood based materials
- Timber structures manufacturing and assembly procedures
- Forms of timber and wood based materials
- Structural forms and design
- Introduction to CP 112 design of solid timber structures.

Skeleton structures; columns and struts beams, gludlaminated sections, trusses and girders, portal frames and arches. Spatial structures, surface structures.

2 units

BLD 518 Operations Research

The course deals with the application of operation research to problems of planning in industry and business with particular reference to the building industry.

Nature of operation research; resources, constraints, and optimization

Cost models, fixed and marginal cost.

Prevention and breakdown costs

Present worth technique and application to decision making in the building industry;

Optimum replacement period

Critical path;- network analysis and logic. Project control by crucial paths, time variation and estimated project times.

Linear programming: scheduling, allocation and distribution examples.

Application of probability theory to systems reliability 2 units

BLD 519 Foundation Engineering II

Soil structure interaction. Lateral and pull0out loading of deep foundations. Pile-group Foundations for offshore structures. Pile-dynamics. Foundations for special structures.

2 Units

BLD 520 Building Maintenance Management

Measurement and pricing of maintenance work. Planning and financing maintenance work: objective of planning. Programming problems. Long-term programmes. Short-term programmes. Planned inspections. Network analysis.

2 Units

BLD 521 Soil Mechanics II

Advanced soil Mechanics, Soil Physics. Partial differential equation governing consolidation. Exact and approximate solutions. Land subsidence.

2 Units

BLD 522 Design Economics and Cost Planning

Critical appraisal of cost planning system

Introduction to investment valuation

Cost benefit analysis, The economics of industrialized buildings

Cost in use techniques and models

Maintenance and operational costs. The effect of legislation,

Taxation and grants on cost.

2 Units

BLD 523 Property Management I

(1) Development and re-development process. (2) Property Management in relations to social, political, economic physical and location aspects.

(3) Property management process-strategy of estate owner's objectives

(4) Principles of estate management applicable in the management of public and private estates, new towns, expanding towns, local authority redevelopment areas etc.(5) The implications for estate management of legislation pertinent to the relationship between the landlord and tenant.

(6) Marketing and Agency: Types of Agency, legal position of principle and agent; methods of sale; promotion; selling; market segmentation; market research; market planning. Effect of Government policy on property investments with emphasis on land policy implications. Management of institutional Housing and commercial Estates, principles, procedures, problems. 2 units

BLD 524 Case Studies in Specific Maintenance Problem

Independent study in which students are expected to evolve solution to specific maintenance problems. 2 Units

BLD 525 Thermal Environment

Concepts of heat transfer; condition, convection, radiation. The general equation of heat condition through a wall. Steady state condition of heat. Thermal conductivity. Overall heat transfer, coefficient for walls and roofs. Thermal conductivity. Overall heat transfer, coefficient for walls and roofs. Thermal insulation. Emissivities of surfaces. Overall thermal coefficient – Envronmental temperature. Cooling load calculation. Unsteady heat flow; the steady cyclic solution of heat condition equation. Thermal capacity of walls. Amplitude and time lag of surface and air temperatures. Heat gains due to solar radiation.

Sol-air temperature. Heat flow through building fabric due to solar radiation. Condensation: moisture movement in buildings.

2 Units

BLD 526 Fire Protection in Buildings

Process of fire development:- growth period, burning and decay period. Rate of burning. Factors affecting design; materials performance relating to fire. Fire resisting construction. Fire detectors. Fire-fighting equipment

2 Units

BLD 527 Information System & Management

1) General Information Technology Knowledge and Concepts
2) Communication Supported by Information Technology
3) Information Systems Architecture
4) Software Systems
5) Data Organization, Administration and Access Methods
6) E-Government Tools and Software
7) IT Control s and Control Environment
8) Emerging Issues in Information Technology
9) Emerging Issues in Telecommunications

2 Units

BLD 528 Property Management II

Building management general concepts of client departments; janitorial suppliers; services and staff organization. Inventories listing and administration; group and paved area maintenance; maintenance of drainage works; accounts for various bills – electricity, water etc.

Property management organizations and functions of maintenance unit within the setup. Types of maintenance; contingency and planned maintenance; repairs obligations under Tenancy Agreement: maintenance management systems, planning for maintenance, maintenance policies and strategies; management information systems for building maintenance; concepts of tenant participation in maintenance; and self-help schemes in public housing management. Estimating maintenance budgets; execution of maintenance work (DLO or Contract Labour): contract and ministration and management. Job evaluation/feed back systems. Policy issues on alteration improvements (modernization) and conservation/disposal: motivation of maintenance – workers.

1 Units

BLD 530 Engineering Geology II

Geological and engineering classifications of intact rock, rock discontinuities and rock masses. Weathering processes and classification of laterites and laterisation.

2 Units

BLD 532 Reinforced Concrete Structure II

Design and detailing of slabs, beams, stair-cases; columns – axially and eccentrically loaded, foundation. Design of reinforcement/reinforced concrete building structures; composition of loads; dimensioning of sections, constructional provisions and bars bending schedule.

2 Units

BLD 534 Analysis and Design of steel structures

Uses of steel structures, properties of stell structures, connections, design of bolted, riveted and welded connections. Design of plate girders, simple beams, stanchions, purlins and sheeting rails, trusses, lattice girder and bracing, floor plates, composite elements and column bases (using BS 5950) 2 Units

BLD 536 Advanced Design of Timber Structures

- Introduction of structural timber. History of timber houses; beams roof construction etc. Structural timber today.
- Properties of timber and wood based materials
- Timber structures manufacturing and assembly procedures
- Forms of timber and wood based materials

- Structural forms and design
- Introduction to CP 112 design of solid timber structures.

Skeleton structures; columns and struts beams, gludlaminated sections, trusses and girders, portal frames and arches. Spatial structures, surface structures.

2 Units

BLD 538 Energy Utilization in Buildings

Building and climate: passive thermal control in buildings.

Thermal comfort: Thermal comfort indices comfort zones

Energy (electricity) usage in buildings: end uses of electricity rating of buildings (green buildings);

Renewable energy (colar, wind) applications in buildings. 2 Units

BLD 540 Advance A/C and Transportation in Buildings

This course with more advanced studies in the design of air conditioning system:

- The choice of supply design conditions: sensible heat. Latent heat removal, heat gain due to fan power, wasteful re-heat choice of suitable supply state.
- Cooling load: cooling, load and heat gains, partial load, cooling off-set by re-heat, the use of bye-passed air, diversification of load, load diagrams.
- Airflow in ducts – sizing of ducts, the energy balance in system of duck work-airflow in duct sections and branches. Conversion from circular to rectangle section etc.
- Fan and system characteristics: fan laws, efficiency characteristics, fan capacity in duct system
- High velocity systems
- Principles of automatic control fileration
- Vertical transportation: Electric elevation, features common to all passenger elevators electro-hydraulic elevators, general design data space requirements, freight elevators, escalators.

2 Units

BLD 542 Advanced Acoustics & Noise Control

Acoustical properties of building material; special acoustical materials.

Determination of absorption coefficient of materials by:

I. Standing wave method
II. Noise measurement and analysis: estimating expected sound vibration measurement and control community noise traffic noise, equipment noise, noise control in service systems. Practical and tutorial work may include case study of room shaping and reverberation control for a school lecture theatre. Community noise survey and analysis. Road traffic noise survey and analysis. Analysis of machine noise measurement of reverberation time of a hall. Vibration measurement and analysis to investigate the effectiveness of isolation systems.

2 Units

BLD 544 Advance Lighting

- Lighting calculation and design: point sources, linear source, circular and square luminous areas. Lumen method of design Luminance design method. Luminous and lowered ceilings. Cove lighting.
- Electric lamp: types, characteristics, applications Luminaries:- types, selecting a luminaire, luminaires brightness and glare.
- Lighting methods for offices, schools, factories, stores, homes, churches, auditoriums.
- Flood lighting, street lighting
- Illuminance and luminance measurements.
- Luminaires:- types, selecting a luminaire, luminaires' brightness and glare; use of manufacturers catalogues; economic use of lighting..

2 Units