

COURSE CONTENTS

BLD 101 – Introduction to Building and Environment I

History of Building: Functions and Types of Buildings. The Professional Builder: Definition; scope of duties; future prospects; relationship with other professionals in the Construction Industry. Analysis of the various options available in the Building Profession: Construction Technology, Building Services, Construction Management, Building Maintenance and Building Structures. Functions and illustration of various building elements and components – foundations, floors, walls, beams, lintels, columns, roofs, windows, doors, etc. Visit to construction sites.

BLD 102 – Introduction to Building and Environment II

Drawing Instruments, layout of drawings and geometric constructions. Multi-view drawings and graphical representation. Traditional Housing design and development in Nigeria. Elemental composition of a building in relation to the environment and functional requirements. Brief discussion on plants and equipment required on construction site. Organisational Structure and Personnel involved in Construction. Local Materials utilisation in low cost mass housing. Socio-cultural and climatic conditions as they affect building design in Nigeria. Analytical tools for problem solution in building provision. Economic factors affecting building provision: economics and concepts of production, methods of production, pricing methods. Building drawings. Presentation of road designs and simple examples of other Civil Engineering drawings.

BLD 201: Building Construction and Materials I

Site operations and construction personnel. Site Investigation and Site Preparation Processes. Site Organisation and Layout, Clearing, Levelling and Setting out. Excavations – soil classification, methods of excavation: (manual/mechanical). Tools for manual excavation. Problems of excavation (including Site Drainage) and timbering to excavation. Design and construction detailing of elements of building: Foundations (to include subsoil/loading conditions), Floors – solid ground floors, Raised/Upper timber floors, Solid upper floors. Finishes. Modelling of building elements and components. Practicals.

BLD 202: Building Construction and Materials II

Walls: Load-bearing and Non load-bearing walls, Timber walling, Stones wall, Brick/block walls. Bonding, mortar mixes, d.p.c. Wall finishes – plastering, rendering, tyro-leaning, painting, etc. Openings in walls: Doors, Windows, Lintels, beams and columns, Arches. Stairs and fittings. Roofs and ceilings. Drainage – tools, equipment, materials and methods of installation. External Works and Landscaping: Fences and Fencing, Gates, Access roads, Landscaping etc. Preparation of Architectural and Construction Drawings of a simple building up one-storey building. Modelling of building elements and components. Practicals

BLD 203: Structural Mechanics and Strength of Materials I

Introduction to mechanics and design of building structures. The object of structural design. Statics of Particles – Forces in a plane, Forces in space. Statics of Rigid bodies in two dimensions. Statics of rigid bodies in three dimensions. Properties of structural sections – centroid, First Moment of Area, Moments of Inertia, Compound, Sections Radius of Gyration, Polar moment of Inertia, Section modulus, Principal axes and Principal moments of inertia. Mohr's circles for moment and product of Inertia. Direct stress and strain – tension and compression. Stress/strain curves, Hooke's law, Poisson's effect, factor of safety, strain energy, initial stresses, suddenly applied loads, falling loads, creep under loading, fluctuating stress, fatigue under repeated stresses. Analysis of statically determinate structures: Trusses (Method of Joints, sections and graphical methods, calculation of displacement of joints), Beams, Frames, Cables, Shear force, axial force and Bending moment relationship and diagrams. Influence lines for trusses and simply supported beams.

BLD 204: Structural Mechanics and Strength of Materials

Shearing Stresses. Analysis of stress and strain (2/3 dimensions). Longitudinal stresses in Beams. Shearing Stresses in Beams. Beams of Two Materials. Combined Bending/Direct Stresses. Torsion. The Principle of Virtual work and its applications. Strain Energy/Complementary Energy and Applications. Deflection of Statically Determinate beams using different approaches. Elastic Buckling of columns and Beams. Vibration in Beams

BLD 205 – Building and Architectural Science

Environmental Physics – heat, light, sound. Psychophysics: Thermal design. Ventilation and Air Conditioning, Lighting System, light and illumination, Daylight in building, Noise and Building Acoustics, sound, reverberation and sound Insulation.

BLD 206 – Soil Mechanics

Introduction to soil theory, Properties of soil- their classification, behaviour etc. Soil water, permeability and flow seepage problems, Strength and deformation of soils, Stability of slopes; earth pressure. Soil stresses, settlements and movements due to loading. Bearing capacity of soils, foundation settlement. Geotechnical investigation and tests. Soil strengthening and stabilization; lowering ground water. Binding agents and their effects/properties; soil exploration

BLD 208 – Business Organisation and Accounts

The course exposes the students to the financial activities of Building Contracting Firms. The forms of business organisation. The purposes and use of accounting for various enterprises. Basic accounting theory and its application to the needs of the building industry in general and construction project in particular. Methods of cost accounting and control, the financing of business organisation. The interpretation of company accounts.

BLD 301 – Building Construction and Materials III

Detailed study of materials and their performance in construction including clay, concrete, stones, timber, plastics, bricks, paints, metals and alloys, glass, bitumen, synthetic and reinforced polymer products, etc. Production, processing, evaluation and testing method; utilisation in construction and associated problems. Advances in composite tropical materials including terracrete, shwihscrete etc. CASE STUDIES: Clays in buildings: Clay products in buildings – foundation, floors, walls, ceilings, roofs, finishes; performance in buildings; maintenance problems. Maintenance aspects and associated problems. Plastic in buildings: Technology and manufacture; utilisation in buildings, performance in buildings, maintenance problems. Glass in buildings: Technology and manufacture; utilisation in buildings; a critique of glass as external

curtain, maintenance aspects. Problems. Timber in Buildings: timber products in buildings; performance in buildings, maintenance problems.

BLD 302 – Building Construction and Materials IV

Concrete Technology. Detailing a very simple building. Builders drawings. Production of site drawings. Plants and Equipment and tools for builders. Basement/Retaining wall construction and water proofing. Plumbing – materials, methods/installation and pipe sizing. Electrical installation. Preparing schedules/specifications of finishes, doors, windows, reinforcement etc. (This should include specification writing). Development of new building materials/adaptation. Design and construction of temporary works.

BLD303 – Construction Technology I

Review of Site Investigation Processes, soil tests and general principle of foundation design (as taught in BLD 206). Preliminary operations to Foundation Construction. Spread Foundations. Buoyancy Rafts and Basements (Box foundations). Pier and Caisson Foundations. Piled Foundations – Driving equipment and construction methods. Geotechnical processes. Protection of Foundation structures against attack by soils and ground water. Walls – solid masonry, plain monolithic concrete, cross wall construction, reinforced masonry, diaphragm and fine walls, panel walls, party and separating walls, external facings and movement control

BLD 304 – Construction Technology II

Multi-storey Structures – the frame and load bearing wall, choice of appropriate structure. Framed Structures – steel frame, reinforced concrete (In-Situ and Pre-cast) frame, RC wall, prestressed concrete movement control. Floor structures – Upper floors – choice and construction. Movement control. Vertical Circulations – stairs, ramps and ladders. Roof Structures – Beams, trusses and girders, rigid/portal frames, shells, folded slabs, space frames, single-layer grids, double layer grids, folded lattice plates, barrel vaults, domes tension structures, etc. Movement control in structures. Integration of Structures with services and equipment. Communication in Buildings. Underground and space surveys. Astronomy. Introduction to hydrologic/photogrammetric surveys. Mass haul diagram and associated quantities.

PRACTICALS IN BLD 303/304

Setting out of physical structures including buildings, estate roads, highway drains, curves etc. (to be carried out as practicals on site and workshop). Construction Workshop practice (Carpentry, Bricklaying, Plumbing, etc.).

BLD 305 – Building Maintenance I

This course deals with building maintenance technology. Decay of building – agencies involved. Alterations, conversion, extension, improvement in building dimensional consideration. Design defects and remedies. Structural survey of building, specification writing and schedule of dilapidations to include: Measurement of maintenance works, maintenance of mechanical/electrical services

BLD 306 – Building Maintenance II

The course deals with the management aspects of building maintenance. Maintenance cycles for different types of buildings, standard expected of buildings. Maintenance strategies repair/replacement theory, sensitivity analysis, planning maintenance – resources required, programme execution, appraisal policy guidelines. Applications of other Operation Research and other General Management Techniques to Building Maintenance. Landlord/Tenant relationship and other legal matters.

BLD 307 – Building Services and Equipment I

Hydrology, water and wastewater management: Water Supply: prospecting, purification, storage and township boreholes, dams, network analysis, pipe sizing etc. distribution to communities, domestic, industrial and commercial application of fluid dynamics for solving practical problems, needs, statutory provision. Bye-Law requirements. Cold and hot water storage and distribution in buildings. Foul, surface water and real drainage, solid waste management (Refuse disposal, etc.) Sewage treatment/disposal. Detailed measurement of mechanical installations, drainage and external works. Related project work/examples of overall system design with calculations.

BLD 308 – Building Services and Equipment II

Analysis and theoretical/practical design of Lifts, Escalator, Hoists etc. Gas: Production, township distribution and installation within-buildings etc. application of gas law and other relevant equations for solving practical problems. Fire: Analysis, causes, design, prevention and control, etc. principles of fire fighting and associated equipment, byelaw, regulations, codes affecting fire services etc. Visits to sites to appreciate the practical implication of the theoretical frame-works. Practical design for live projects.

BLD 309 – Theory of Structure

Deflection analysis of statically indeterminate structures- (beams and trusses). Analysis of statically indeterminate trusses – application of energy methods. Analysis of statically indeterminate beams and frames using three moment equations, slope deflection equations and Hardy Cross method of moment distribution. Cantilever and Portal Methods of Moment Distribution. Column Analogy: Influence Lines applied to statically indeterminate structures.

BLD 310 – Design of Reinforced Concrete Structures I

Introduction to reinforced concrete structures. Properties of steel and concrete. The typical building frame – columns, main beams, secondary beams and slabs. Introduction to reinforced concrete design – CP 114, CP 110, BS8110. Serviceability limit states: cracking, deflection, anchorage, bond and curtailment. Design of singly reinforced concrete beams, doubly reinforced and flanged beams including design for shear reinforcement. Design of axially loaded columns. Design of simple one way slabs, stair cases and two-way slabs. Structural Detailing.

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BLD 312 – Project Planning and Control

The course deals with the sequence, organisation and control of projects and the interrelationship between various professional groups involved in the development of capital projects. The meaning of management and its role in construction. The nature of capital projects – client, consultants and contractors. Management tools/techniques (CPM, Bar charts, LOB, etc.) Tender analysis. Building management procedures from inception to completion. Co-ordination; control and supervision of simple and multiple contracts, site layout, report for management.

Financing capital projects; working capital flow of funds. Legal implication of building contract. Regional organisation of typical professional offices.

BLD 401 – Structural Analysis

Introduction to Kani's method of moment distribution. Matrix methods of structural analysis (stiffness and flexibility). Applications to beams, plane frames, trusses and grillage/grid (Plane and space) structures. Plastic method of analysis.

BLD 403 – Design of Reinforced Concrete Structures II

Design and Detailing of columns subject to Moments including Biaxial Bending. Slender columns. Design of Plain and Reinforced concrete walls. Design and Detailing of Ribbed/Waffle slabs (solid or hollow blocks or voids), flat slabs. Design and Detailing of foundations. Pad (axially and eccentrically loaded). Wall, strip and combined. Raft, Pile. Retaining walls (gravity, counterfort and Cantilever). Design and detailing of water – retaining and precast concrete structures (Swimming pools, underground, surface and elevated tanks). Torsion in reinforced concrete. Introduction to the design of prestressed concrete structures. Term Projects: (1) Complete Design and Detailing of a Multi-Storey. Reinforced concrete framed building (including design for ties) (2) Design and Detailing of a water-retaining structure.

BLD 405 – Principles of Construction Management and Production Management

The course deals with management principles and practice generally, management science, organisation theory, their application to building projects. Personnel Management. Communication and Communicating System. Introduction to decision theory. Financial and Cost Accounting. Financial and Cost Management. Appraisal and control of capital project from inception to completion. Planning: Pre-tender planning, method statement; short-term and long-term planning and scheduling techniques. Materials supply. Purchasing allocation and levelling. Cost optimisation, cost control of site work. Safety on Construction site and quality management. Site meetings. Site records.

BLD 407 – Building Services III

Telephone and P.A. Services. National communications network. Communication within buildings. PAY, PABX, PMBX systems. Public Address Systems. Fire alarm systems related to communication and fire control processes in buildings. Advanced water supply and distribution networks for towns, industrial and domestics' purposes. Advanced wastewater management. Advanced gas supply system for towns, industrial and domestic purposes. Installation, metering and scale of tariffs. Measurement of Electrical Installations including wiring systems. IEE Regulations – Project – overall system design with calculations (for both mechanical and electrical services using full scale Engineering/M & E drawings and specifications/symbols).

BLD 411 – Integrated Studio Work/Technical Report Writing

This is essentially a studio work to unify the entire courses offered by the main stream of students. Solutions to set assignments (architectural, structural, services design, preparation of estimates and quantities maintenance surveys materials and structural testing with adequate clarity and against a time frame. It also treats the roles of technical report in building, projects fundamental principles of technical writing. Format of different types of reports – outlines, scope and purposes, technical discussion and details. Role of appendix, functions of diagrams tables and illustrations, nature of recommendations and conclusions. Writing memoranda, business letter, formal and informal reports.

BLD 501 – Advanced Construction Technology I

The course deals with complex contemporary buildings and specialised topics in construction technology. Construction in shallow and deep waters. Construction of Tunnels and Railway Tracks, Retaining walls. Construction of railway tracks. Applications in swimming pools, jetties, harbour works, anchorage, embankment stabilization, retaining wall, construction and coffer dam construction. Evaluation of alternative structural forms, performance of structural systems and building envelope. Prefabrication: Design techniques (Modular coordination, etc), production techniques (factory, on-site) and assembly techniques (material handling, fixings, fastenings, jointing techniques, etc). Industrialised systems building versus traditional solution.

Standardisation, quality control and dimensional accuracies in buildings. Proprietary system in buildings.

BLD 502 – Advanced Construction Technology II

The course deals with specialised topics in construction technology, including industrial processes and engineering services required for effective functions. Mechanical plant and equipment. Large open roof systems (as applicable in large-span roof design and construction e.g. in amphitheatres etc). Piling systems. Dam Construction. Construction of Bridges and Roads. Introduction to Civil Engineering measurements. Case studies on building failures.

BLD 503 – Management of Building Projects

The course deals with building production procedures and practices, which facilitate high productivity on the building site. Technique of project management. Clients, consultants and contractors managerial staff relations. Co-ordination of effort of designers sub-contractors etc. with the construction process. The role of mechanical plant in construction project management.

BLD 504 – Advanced Project Management

The course deals with the practice of project management as a direct service to clients on an in-house or consultancy basis. Analysis of management thoughts, the use of electronic computers in feasibility analysis, design, execution and management of building projects including management technology, financial appraisal and use of scarce resources. Marketing of Construction and Construction products. Construction Risk Management. Quantitative Management and Applications. Resource management and Inventory

BLD 505 – Professional Practice

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 Board and its regulations. Joint consultative council. SIWES programmes. Partnerships and consortia, design and building constructions. Roles of Professional Builders. Tendering and bidding strategies. Consultancy practices and their regulations.

BLD 506 – Design of Steel Structures

Introduction to steel structures; production and properties of steel and steel systems. Specification of strength and yield stresses of steels; other properties. Basic structural steel sections, traditional hot rolled sections, cased sections, composite sections, steel cables. Corrosion protection of steel structures. Fire protection. Introduction to BS 449 and BS 5950 (Parts 1 & 2). Structural forms of steel work. Design of basic structural elements i.e. axially loaded members, beams and columns. Simple truss design. Design of connections: bolting, riveting & welding, rigid and semi-rigid connections. Column connections to foundations. Web buckling, web crushing and lateral torsional buckling. Design of Plate Girders. Design of Industrial Buildings.

BLD 507 – Project Dissertation I

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. The course will last a whole session.

BLD 508 – Project Dissertation 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. The course will last a whole session.

BLD 509 – Construction Plant and Equipment

Technical improvements in construction plant and equipment have caused a movement away from manual labour towards mechanisation of construction sites. This course provides adequate information in this topic. Fixed position excavating machines; the bulldozer, scraper, grader, the loader shovel. Special excavating equipment cranes; shear legs and derrick tower cranes; gantry (portal) crane hoist. Fork lift, truck concrete pump etc. Economic comparison of plant alternatives plant profitability and acquisition. Systematic plant selection, calculating plant hire rate. Plant maintenance.

BLD 510 – Productivity Studies on Site

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. Production targets and incentives. Case Studies.

BLD 511 – Highway Engineering

The course deals with the basic elements of highway design and Construction as a primary infrastructures. Planning requirement and layout. Traffic surveys. Road design, construction and maintenance. Highway structures. Low cost roads, footpath and giver ways. Location of services.

BLD 512 – Advanced Building Production/Process

The course is designed to expose the students to advanced system of building by highlighting possibilities now and future for examples: soil strengthening, system of prefabrication, self-weathering applied finishes, jointless flooring.

BLD 513 – Systems Analysis in Construction

System approach to planning; design and operation of large scale physical system: economic and building concepts: linear programming; network and decision analysis; concepts of problem formulation, synthesis and analysis. Applications to building and construction problems.

BLD 514 – Construction Budgeting and Finance

Introduction to forms of Business Organisation: Formations, Operations and Structures of business organisations. Financing of business organisations and construction projects. Risks involved in construction financing. Insurance issues in construction financing. Accounting Theory, Cost Accounting and Purpose of Accounting. Budgeting, control systems and capital budgeting cost control. Working Capital. Profitability Case Studies.

BLD 515 – Technology and Masonry Design

Introduction to design and technology. Masonry types, stone, bricks, blocks, mortar, materials, properties, reinforcement. Durability of masonry structures. Movement of masonry moistures. Movement and thermal movement. Bonding and workmanship. Calculating structural masonry. Introduction to BS 5628 and CP 111 Empirical method – Building regulation.

BLD 516 – Information System and Management

Definition of information needs use. Communication theory, and sources of information; reliability and interpretation of external information for management purposes; design of management information systems. Applications of GIS to Information System and Management in construction.

BLD 517 – Design of Timber Structures

Introduction to structural timber. History of timber houses; beams roof construction, etc. Structural timber today. Properties of timber and wood based materials. Timber preservation and fire retardant treatments. Timber structures manufacturing and assembly procedures. Forms of timber and wood-based materials. Structural forms and design; introduction to CP 112 and BS. Design of solid timber laminated sections, trusses and girders, portal frames and arches. Spatial structures, surface structures. Joints in structural timber; classification of joints, structural jointing by adhesives. Jointing by nails or staples.

BLD 518 – Design of Highway Structures

Highway standards, design speeds, geometric design for cross sections, grade, alignment, channelisation; inter-sections including grade, rotary and grade separations; highway drainage and open channel designs, culvert designs, bridges, sub-grade, sub-base and pavement design; route location; construction of cuts and embankments, bituminous and concrete pavement design.

BLD 519 – Advanced Structural Analysis

Computer applications of matrix methods of structural analysis. Introduction to finite element methods. Introduction to theory of elasticity. Theory of plates and shells. Buckling of structures.

BLD 520 – Advanced Masonry Design

Isotropic and orthotropic masonry. Rayleigh's method of analysis. Dynamic behaviour of masonry structures; multi-degree of freedom systems. Finite element analysis of masonry structures. Bending, shear and temperature deflection. Design of high rise external and internal walls and cantilevers.

BLD 521 – Fundamentals of Geotechnology

Review of Site Investigation Procedures (to include compaction and location of suitable highway subgrade materials). Design of Shallow foundations to include strips and rafts and special footings (e.g. Beam/Mat on elastic foundation). Deep foundations to include piles (Static and Dynamic analysis), piers and caissons. Retaining Structures (Lateral Earth Pressure, Retaining walls, cantilevered and anchored sheet piles, Braced, Tieback and Slurry walls for excavations, cellular cofferdams). Earth dams. Design of foundations for vibration control.

BLD 523 – Acoustics

* Acoustic principles involved in the designs and use of loudspeakers. Microphones, amplifiers, sound level metres, B.F.O's audiospectrometres, tape recorders, pen level recorders. Growth and decay of sound in enclosures. Design of room shape-wave and geometrical acoustics. Speech and music. Sound insulation and absorption. Acoustic models. Noise and the laws. Construction to ultrasonic and underwater acoustics. Practical and tutorial work covers: Calibration of a probe microphone, Frequency and directional characteristics of a loudspeaker, Measurement of reverberation time of Oduduwa Hall or Agric Lecture Theatre, Absorption coefficient of materials by (i) standing wave method (ii) reverberation chamber method, Airborne and impact noise insulation of student flat, Investigation of the sound distribution in a room and model of that room

Analysis speech and music,

BLD 524 – Advanced Design of Concrete Structures

* Detailed Treatment of Yield line theory. Yield Line theory, Basic Johnansen Theorems Equilibrium and Energy Methods; Isotropic and Orthotropic slabs – Affine and Ultra Affine

Method; Strip Method of Design. Design and Detailing of Roof Slabs (Pitched and Folded Plate). Shells (Barrel Vault and Dome), Hyperbolic paraboloid (Normal and Inverted). Design and Detailing of Compiled Stairs (Cantilever, Jack-knife, open spiral, spins beam with open risers, precast flights to in-situ landings), columns (heavily reinforced, raking struts, spread columns including treatment of Junction details). Design and Detailing of Tall buildings (Design and Analysis considerations; Planar lateral – load-resisting elements – rigid frames, shear and lift walls, coupled shear walls, shear walls connected to columns, wall frames; interaction between bents; three-dimensional structures – classification and computer modelling, non-planar shear walls, framed tube structures. C.R.P Laminates and Sandwich Panels. Design of Frameworks – Portal frames; water tower support, H and A frames. For precast wall units, Box frames for elevated corridors. Statically Indeterminate Prestressed concrete structures. Introduction to Bridge Design. Term Projects – To cover the major divisions of the Syllabus and encourage the use of Computer aided design (CAD).

BLD 525 – LIGHTING

Study of appliances: Incandescent electric lamps, Discharge lamps, Fluorescent lamp. Control gear Luminance design and construction. Illuminance and luminance calculations for complicated systems and buildings. Practical and tutorial work. Illuminance and luminance measurement. Light output and distribution of electric lamp.

BLD 526 – Advanced Geotechnology

Further principles of site investigation including boreholing or disturbed and undisturbed soil sampling as well as ground water exploitation; tunnelling practice; elastic theories and soil deformation; yield/slip line; limit and equilibrium analysis, plasticity, rheology and critical state in soils.

BLD 527 – Advanced Building Services Design Theory

This subject covers the systematic approach to decision making in building services design. The topics to be covered relate statistical laws and economic laws explicit to the physical laws governing services design. The following topics will be covered: Introduction to building

services design theory. The statistical laws of demand. The economic laws of supply and distribution. Individual building services sub-systems. Total systems.

BLD 528 – Advanced Design of Steel Structures

Plastic design of Steel Structures. Composite construction. Web buckling, web crushing and lateral torsional buckling. Design of Vierendeel girders. Multi-storey steel structures and framing methods. Introduction to design of steel bridges. Tensile structures – stressed skin, suspended cables, arches.

BLD 529 – Thermal Environment

Thermal Environment and its measurement. Measurement of Air temperature, air velocity, air humidity and moisture content, radiation, surface temperature. Thermodynamic properties of the environmental fluid. Fundamental properties of air and water vapour mixtures, the gas laws, Pure and applied psychometrics. Ventilation and control of ventilation. Physiological considerations, control of odours and contaminants, control of airborne bacteria and infection, dilution and decay techniques, air distribution. Air filtration. Heating, cooling and ventilation, introduction to systems.

BLD 530 – Advanced Building Acoustics

Propagation of noise outdoors. Transport noise road, rail and aircraft. Impulse noise. Vibration measurement and control. Effect of vibration on man, criteria. Noise in piping and duct system. Equipment noise – mechanical and electrical. Practical and tutorial work covers. Road traffic noise survey and analysis. Measurement and analysis of impulse noise. Analysis of machine noise with sound power estimations. Vibration measurements and analysis to investigate the effectiveness of (a) vibration insulation systems (b) damping.

BLD 531 – Advanced Building Maintenance Technology I

Planning, financing, executing and supervising maintenance work. Case studies. Measurement and existing of maintenance work.

BLD 532 – Advanced Lighting Design

Specialist application and their varying requirements. Integrated ceiling. Exterior lighting, decorative flood, street, sports, tunnel. Vision and perception. Sunlight and window design. Day light and electric light integration. Daylight planning and legal requirements. Practical and tutorial work

Sunlight studies, perception studies. Heat generated by lighting. Models to investigate effect of window shape, size and position for day-lighting. Field studies of artificial and daylighting.

BLD 533 – Planning Systems

Relationship of planning to maintenance. Objectives of planning. Components of planning. Schedule/contingency systems. Factors influencing delay time. Programming problems. Long-term programmes. Annual programmes. Short term programmes. Planned inspections. Network analysis

BLD 534 – Thermodynamics & Heat Transfer

The Second Law of Thermodynamics. Reciprocating machines. Application of First Law to reciprocating machines. Efficiencies utilization of the cooling system etc. Power cycles. Thermal efficiency and work ratio, Carnot vapour and Rankine cycles, superheat, air standard cycles and applications (Emphasis on vapour compression heat pump cycles). Brief introduction of cooling cycles. Heat pump energy ratio. C.O.P. reversed carnot cycles and refrigerants. Intropy calculations.

Heat transfer. Convection (qualitative and quantitative) LMTD in heat exchangers, parallel and counterflow modes, introduction to boundary layer for plate and tubes, nusselt and raudtil and ryncldc numbers for both laminar turbulent flow. Dimensional analysis for forced convection. Radiation (Qualitative and quantitative). Steam-Butzmann Law, Emiasivity, Krchofts Law, Radiation. Exchange factors and factors and heat transfer coefficients. Convective and radiative modes. Periodic Heat flow (Qualitative and Quantitative). N.T.U. and Newtonian heating and cooling applied to buildings. Building introduction to heat transfer (qualitative only). Hardware,

flow patterns, fins, tubes, pins, air/hot water and Steam heat exchange, water/hot water and steam heat exchangers (shell and tube). Energy conservation in Buildings.

BLD 535 – Maintenance of Building Electrical Systems

Basic principles of electric maintenance. Maintenance of electrical. Systems in building, estates, factories, and other specialised Physical structures, Trouble shooting and preventive systems
Electrical systems in construction plants, etc.

BLD 536 - Integrated Environmental Design

Various advanced aspects of the application of light, heat and sound in building technology. Energy conservation in buildings. Retrofit. Hybrid systems. ERE admittance method. Project. Application of energy conservation strategies in now of retrofit building.

BLD 537 – Computer Applications in Building

The course deals with the applications of relevant modern software packages in different aspects of Building. The students in also expected to write simple programmes in BASIC FORTRAN, etc to solve simple problems in building.

BLD 538 – Advanced Building Maintenance Technology II

Building maintenance problems and their solutions to the following Foundations problems waterproof leaking basement paved and grassed areas. Cladding brick-work stone-work, structures frames condensation timber defects, floors, cases, sound insulation thermal insulation, vibration, External finishes grazing. Hot water supply plumbing air conditioning, mechanical fans, Scope of alteration and improvements, moderation of buildings dilapidations.

BLD 540 – Maintenance of Building Mechanical Systems

Basic principles of mechanical systems maintenance. Maintenance of mechanical systems in the natarors factors and other specialised physical plants and equipment etc.

SERVICE COURES TO ARCHITECTURE DEPARTMENT

BLD 311 – Structural Theory and Design I

Introduction to structural forms and systems, Solid Structures- skeletal structures, surface structures. Structural systems – arches, Cables, shells pneumatic structures etc. Estimating of loads on buildings (dead load, live load, wind load). Deflection analysis of statically determinate and indeterminate structures. Three-moment: application to continuous beams only

BLD 314: Structural theory and Design II

Slope deflection equations and applications to beams and frames. Moment distribution: applications to continuous beams and frames. Introduction to reinforced concrete design philosophies – working stress, factor method and limit states. Review of properties and behaviour of concrete and steel strength. Durability, effect of temperatures, etc.

BLD 421- Analysis and Design of Timber and Steel Structures

Introduction to Structural timber. Analysis of stresses on wood. Properties of timber and wood-based materials. Design of timber structures – solid and skeletal, trusses and girders, portal frames and arches. Spatial structures. Design of joints in Structural timber. Criteria for selection of structural systems in steel. Design of steel beams. Design of joints and connections in steel.

BLD 422 – Analysis and Design of Concrete Structures

Review of Structural Analysis Techniques. Introduction to code of Practice BS 8110. Criteria for selection of Structure systems in concretes. Serviceability Limit States: Cracking and deflection only. Design of Simple beams for bending and shear reinforcement. Design of one-way and two-way slabs including stairs.

Special Electives

12 Units of Special Electives are to be selected outside the Faculty of Environmental Design and Management.

		Units
SEA 001	Government and Administration of the Public Sector	2
SEA 002	Elements of Business Management	2
SED 001	Poverty and Health	2
SEE 001	Indigenous Education in Nigeria	2

SEE 002	Education, Customs and Society Organisation	2
SEG 001	Food Production and the Nation	2
SEG 002	Agriculture and Human Survival	2
SEH 001	Man and His Health	2
SEH 002	Community Health and Human Behaviour	2
SEL 001	Introduction to Law	2
SEL 002	Introduction to Legal Institution and Processes	2
SEO 001	Fundamentals of Human Behaviour I	2
SEO 002	Fundamentals of Human Behaviour II	2
SEO 003	Principles & Practice of Entrepreneurship & Self-Employment	2
SEO 004	Business Environment & Approaches to Business Start-Up	2
SEP 001	Drugs and Society I	2
SEP 002	Drugs and Society II	2
SER 001	Use of English	4
SER 002	Humanity and the African Experience	2
SES 001	Man and His Biological I	2
SES 002	Man and His Biological II	2
SET 001	Technology and Society I	2
SET 002	Technology and Society II	2