Course Description

BLD 601 Advanced Management in Construction

This course introduces the student to the theory of Management and Business management in general, information Retrival and Management, Management objectives and office procedures, Production Methods and Control, Financial accounting and control of funds, Building Contracts and procedures tendering and bidding, forecasting and Planning the use of statistical concepts of probability.

It also covers areas of Plant Management and Construction equipment cost analysis Personnel management. Industrial Relation both at site and office administration, building management and influence of economic factors and communication within the construction industry.

BLD 602. Design and Construction Methodologies

The objective of this course is to provide adequate knowledge on the theory and practice of design and construction of buildings. Design methods and production processes. Production Methods and Processes on the Building sites. The influence of large unskilled labour on design and Construction Methodologies Reshaping the value judgement of design and production terms in the construction industry.

BLD 603. Building Economy and Industrial Organization

The importance of economics in construction management is covered in this course Business Objective: the allocation of resources market mechanism Demand theory indifference analysis, supply, Production function costs Models of market behaviour, monopoly competition discrimination monopoly, imperfect competition behavioural theories factor markets the remuneration of factors of production definition and measurement of National income. The circular flow of income consumption saving investment. Fluctuations in general and building activity. The role of money, interest rates, inflation, International trade government economic policy; government intervention location of fabrication and assembly transport costs scale of economic activity comparison between construction and other industries integrated diversification mergers; legislation restrictive practices experience in construction industry. The structure of and communication within the construction industry, implication for cost quality and growth of output.

BLD 604 Building Projects Finance

Introduction to financial accounting. Examination and analysis of source of funds for financial working capital and other real estate transactions. Investment Analysis with particular reference to construction projects. Management serving and repayment of loans; methods of loan renegotiations and rescheduling. Policy and decision-making as it relates to financial

management Example – hiring /buying/leasing plant and equipment making and buying building material and products: urban Development Financial etc.

BLD 605 Construction Plan and Equipment

The importance of construction equipment in the production of buildings, Typical construction, equipment, Classifications, Performance and their relative cost advantage. Plant and Equipment – Management selection brands mode of acquisition and use, operation maintenance and safety measures. The annual cost depreciation replacement and scraping of construction equipment. Influence of tax buying of new equipment the development of appropriate basic equipment for the development countries.

BLD 606. Work Study Applied to Building

Introduction to Workers Preference and Productivity Studies, Time Study-Principle Procedures and Applications. Work measurement Principles Procedures and Application. The use of activity sampling on the Building Sites-Practical applications, difficulties and prospects job evaluation and value engineering investigation of alternatives financial and non-financial incentives workers attitudes.

BLD 607 Advanced Management Studies

Manpower management Industrial relations as a fact of management Main areas in industrial relation Negotiation of incomes and conditions of employment agreements Procedures for avoiding disputes. Joint consultative arrangements. M Fringe benefits – state private and collective. Negotiation procedures. The role of the government in industrial relations Conciliation and arbitration in the prevention and settlement of trade disputes. Dismissals procedures selection or redundancy procedures statutory tribunals for safeguarding rights of individual recognition of trade unions organization and manpower delegation recruitment and selection Marketing research the purpose and scope and of marketing research. The major variables. Types of study Advertising research. Readership surveys, impact measurement sales forecasting simple regression analysis multiple factor analysis.

BLD 611: Building Maintenance Technology

Forms of changes in building Decay changes in appearance, weather foreign attacks, etc, the mechanisms and processes of the changes. Methods for maintaining physical stability influence of environmental factors construction detailing as tool against premature failures; tolerance and standards Performance testing and durability prediction case studies on service performance of buildings Qualitative Studies Maintenance as an extension of design methods.

BLD 612 Principles and Practices of Maintenance

`Analysis of Maintenance works in selected organizations Structure of the maintenance, Direct Labour and building maintenance Direct labour and building maintenance Contract Maintenance Economics and control systems supervision of operations Professional standards to management of residential, commercial and industrial properties leasing and tenancy terms Structure survey practices. The management of public properties.

BLD 613 Building Codes and Regulations

A review of codes and regulation from planning control and application view points. National codes States Codes Local Codes and other regulating agencies of relevance to the construction industry. Special studies in fire health safety, materials specification etc standards and the practically of some known standards.

BLD 615 Building Materials and Structures

The structure and use of currently applied building materials. The functional adequacy of existing methods. Application of existing materials including local ones to new situation. Advanced Construction Techniques. Appropriate production techniques for manufacturing building materials locally, Practises and Procedures in the use of other Building materials. The use of new materials for structural purposes Specifications.

BLD 616: Theory of Structure

Elastic analysis of plane and space, frames, elastic instability of members and frames. Plastic analysis of plane and space frames incremental collapse, alternating plasticity and shakedown, influence of axial loads and instability on plastic collapse loads, failure loads deflection of members after yielding begins, natural frequencies of vibration, dynamic response to impulsive loads: fatigue; approximate methods of analysis.

BLD 617 Structural Stability

Buckling of columns for various loading conditions. Stable and unstable equilibrium. Bucklings load of tapered columns. Elastic stability of framed structures. Lateral and torsional stability of beams and beam-columns. Beams on elastic foundation. Inelastic stability of columns. Bending and buckling of plates and shells.

BLD 618 Strength of Materials

Two and three dimensional problems in theory of elasticity in plates shells and bars under various loading conditions: propagation of waves in elastic media; finite element methods torsion Fracture mechanics of structural materials and appropriate usages; non-destructive testing in – situ testing creep and deflection in concrete crack with perdition.

BLD 619: Advanced Structural Analysis

Analysis of statistically indeterminate frames and arches by the slope-deflection, moment distribution, including Kani"s method, area-moment and column analogy methods. Influence lines method for continuous beams and frames. Force and displacement methods of matrix structural analysis applications to beams, frames, grids, etc.

BLD 620: Advanced Design of Timber Structures

Properties of wood. Stress-strain relationship in anisotropic materials. Design of wood frames arches and shells. Glue laminated timber structures.

BLD 621: Advanced Design of Reinforced Concrete Structures

Advanced topics in reinforced concrete design using ultimate strength Deflections and shear strength calculations under different loading conditions of beams, beam – columns, slabs etc. Compression members. Two way slab, flat Torsion Composite construction. Introduction to prestressed concrete, Special problems in design

BLD 622. Advanced Design of Steel Structures

Compression members Designs of columns and effect of shear. Bending of unsymmetrical sections, Design for torsion and backing. Thin web plate girders. Beam- Column, Steel frame Design and the unstiffened light gauge steel elements. Effect of fatigues Standardisation in designs.

BLD 623 Concrete Practice

Quality control of concrete in its various applications. The design of concrete mixes to produce. The Laboratory efforts for large-scale production Field operations and laboratory testing of samples models and full size structural members precast concrete and prestressed concrete practice. Effect and failure in concrete works and products including remedies. Fire effects on concrete.

BLD 625 Thermodynamics and Aerodynamics of Buildings

This course deals with modes of heat transfer and effects of wind on buildings.
Thermal: Dynamics and steady state heat flow, units of measurements, thermal characteristics of various building materials

Wind Effect: The action of wind on pressure pattern around buildings design methodology, field measurements.

BLD 626: Building Services Design Theory

This course will deal with the fundamental concepts which give rise to better design of engineering services in buildings.

Flows system; complementary system; sizing of systems, control of systems; services as building sub-systems; total systems.

BLD 627: Climate and Thermal Comfort

The sun; electronic wave spectrum Terrestrial solar energy interception rate of energy usage; annual variation in local solar intensities; external design condition for dry, wet and Harmattan Seasons; microclimate; large scale weather modification.

Assessment of thermal comfort; various parameters affecting thermal comfort. ASHRAE comfort charts.

BLD 628: Introduction to Energy Management

Managing energy. Principles of energy conservation. Role of the energy manager. Energy auditing and costing. Control and planning. Energy measurement. Primary fuels – classification, delivery, storage and handling. Sources of loss and loss control. Steam and hot water production. Component costs and their control. Boiler efficiency. Steam distribution and use. Chimneys and waste gas handling: Industrial space cooling – system, air changes, buildings insulation controls, heat recovery. Furnances – heat losses, heat recovery. Drying processes. Electricity tariffs and cost control. Load factor, Power factor. Compressed air. Water. Lubrication and 'waste' oil Transport fleet operations and equipment.

BLD 629: Ventilation and Airconditioning

Ventilation systems types of fans and air filter fan duty and characteristics. Fundamental properties of air and water vapour mixtures, psycholotry or air conditioning process. Heat gain from solar and other sources. Cooling load. Vapour compression refrigeration, cooler coils and air washers. Refrigeration plant: automatic controls, Airflow in ducts. High velocity systems. Computer aided design.

BLD 630: Advanced Vibration and Noise Control

Improving room acoustics. Sound Insulation. Motorway noise and dwellings. Vibration in buildings. Theory and Practice of acoustics design. Measurement of sound.

BLD 631: Lighting and Electricity

Theory of light propagation. Estimating daylight in buildings. Calculation of illuminance and luminance in interiors. Heat from lighting, Design of lighting system on Buildings. Overhead and underground distribution systems. General layout of distribution systems and wiring installations. Distribution substations (transformer stations). The basic scheme of interconnected low voltage distribution systems (operating voltages). Three-phase, four wire connection. Typical rural distribution systems. Voltage control in distribution networks. Network calculations on distribution. Earthing in transmission lines low voltage distribution systems, industrial and domestic installations. Domestic Control units. Relative economy of distribution methods. Organization of Power supply. Regulations on installation and operation of electrical equipment. Method of charging for electrical supply.

BLD 632: Energy Conservation Methodologies

Fuel prices and conversion. Efficiencies. Reduction of energy consumption. Optimising building design for energy self-sufficiency Low-cost energy saving methods. Reduction of room temperatures. Draughtproof. Application of thermal insulation, conductive, convective and radiative insulators. Mass transfer insulators. Thermal insulants. Cavity walls. Double-gazing Effects of applying low-cost energy-saving methods to buildings. Thermal design.

BLD 633: Energy Accounting

Introduction. Measurement of resources. Building resource allocation model. Life cycle costing. Life-cycle costing using market prices. Life-cycle costing using prime energy accounting Energy analysis. Life-cycle costing using energy analysis.

BLD 634: Finite Element Analysis

Basic concepts of finite element technique. Application of finite element method to elastic problems in plane stress and plain strain. Plate bending; shell analysis, structural stability and non-linear problems. Survey of numerical methods applied to finite element method. Finite element software, equation solvers, eigen-value routines and schemes for direct integration. Band and front minimizer, substructuring.

BLD 635 Structural Dynamics

Behaviour of one-degree and multi-degree systems under free and forced vibration. Normal frequencies and modes of vibration. Analytical and numerical methods of analysing the response of structures – Viano-Stadola, Rayleigh-Ritz and methods of obtaining eigen-values and eigenvectors of normal vibration. Langrange equation. Model analysis of multidegree systems. Static analysis of the earthquake problem. Dynamic seismic analysis. Concepts and techniques of seismic design.

BLD 636 Elasticity

Stress – Strain analysis. Field equations and boundary value problems. Variational method of the theory of elasticity – Bending, buckling and torsion. Complex variable methods. Three dimensional problems. Elastic waves. Vibrations. Introduction to plasticity. Stress spaces, loading path yield surface. Various deformations and incremental theories. Boundary value problems of plasticity.