CC 111 - Introduction to Computer
Cr.3. Prerequisites: None

An introduction to computers and computing - Topics of interest include the impact of computers on society - ethical issues, and hardware /software applications - including internet applications - system unit - storage and input/output devices - numbering systems - system and application software - presentation skills - program development -programming languages - and flow charts - Visual Basic - web page design using HTML, and communications and networks.

BA 223 - Mathematics 3
Cr.3. Prerequisites: BA 124

First order D.E. (i) Separation of variables (ii) Homogenous equation - First order D.E. (iii)Exact equation (iv) Linear Equations - First order D.E. (v) Bernoulli's equation – First order D.E. Second order D.E with constant coeff. (Homogenous equations) - Method of undetermined coefficients - Second order D.E. with constant coeff.(Non - homogenous equations)- Method of variation of parameters - Euler homogenous equation - Laplace Transform: Basic definition - First shift theorem - Laplace Transform: Transform differentiation & Transform integration - Unit step function – Second shifting theorem – Convolution theorem - Inverse Laplace Transform. Solution of D.E. and integral equations using Laplace transform- Application: Solve R-L circuit using Laplace transform - Fourier Series: Fourier series for functions of period 2P - Fourier Series: Fourier series for even and odd functions -Fourier Series: Fourier series for harmonic functions.

EE 238 - Electrical Engineering Fundamentals
Cr.3. Prerequisites: BA 124

Introduction - Basic d-c circuit – Resistance – voltage - current, and ohm's law -Kirchhaff's laws - Resistances in series or parallel - Mesh analysis - Nodal analysis - Source transformation – Superposition - voltage and current divider - Laws of magnetic force - Field strength - flux density - Relation between B,H,I,K. Alternating current generation – Waves - effective value and mean value - Phasor representation - Voltage, current and impedance as complex numbers - Phasor analysis - Instantaneous and complex power.

BA 141- Engineering Mechanics 1
Cr.3. Prerequisites: None

Introduction to mechanics - Plane and space force analysis - projection and synthesis. Moments - Couples and wrenches - Static equilibrium - Technique of free body diagrams - Applications of static equilibrium of machines - Method of virtual work and its application to solution of problems of static equilibrium.

BA 114 - Physics 2
Cr.3. Prerequisites: BA 113

The behavior of the fluid under different conditions to calculate the net work done on or by the system - Standing the first and second law of thermodynamics – Heat - work and internal energy of the fluids (liquid and gas) should be calculated for different processes under different condition - Heat transfer is also studied through this course.

ME 151 - Engineering Drawings & Descriptive Geometry
Cr.3. Prerequisites: None

Engineering Drawing: introduction –Types of lines-Size of drawing papers - Layouts of drawing sheets - Graphics instruments – Scales - Geometrical construction-Orthographic projection – Sectioning – Dimension - Pictorial drawing - Conventions.

Descriptive Geometry: Locus of a point - Monge's projection - Straight line(particular position) - The plane-Auxiliary planes - The positional problem - The projection of a circle - Curved surfaces - Intersection of surfaces of revolution - Helix-Helical surface -Perspective projection.

BA 113 - Physics 1
Cr.3. Prerequisites: None

Electrostatics (Conductor and insulator) + Coulumb's law - The electrostatic force between multiple charges - The electric field for tow like and unlike charges - Electric potential, potential energy - Capacitors (Parallel plate capacitor, energy stored) - Capacitors with dielectric between its plates - Electric currents an DC circuits - RC circuits. Magnetism (Force a charge and current carrying conductor) - Generation of magnetic fields - Electro-magnetic induction, magnetic flux, faraday's law - Lenz's law, mutual induction-self induction - Physical optic (Huygen's principle of light-interference).

BA 123 - Mathematics 1
Cr.3. Prerequisites: None

Definitions and intuitive meanings of derivatives - Higher derivatives - Basic techniques of differentiation - Chain Rule - Parametric equations - Partial differentiation - Implicit differentiation - Inverse function theorem - Logarithmic differentiation – differentiation - Logarithmic functions - Exponential functions - Trigonometric functions - Inverse trigonometric functions - Hyperbolic functions - Differentiation of those - Physical and geometric applications of differentiation - Limits; N^{th} derivative -L'Hopital rule - Maclaurin's expansion as approximations of functions - Analytic geometry - Translation of Axes -Conic sections.

BA 142 - Engineering Mechanics 2
Cr.3. Prerequisites: BA 141

Introduction of the kinematics of the particle, rectilinear and projectile motions, force and acceleration. Moreover, work and energy of a particle, rotation of a body about a fixed axis, general plan motion, relative velocity and acceleration, equations of translation – rotational

BA 124 - Mathematics 2
Cr.3. Prerequisites: BA 123

Definitions and intuitive meanings of indefinite and definite integrals - Fundamental Theorem of Calculus - Basic techniques of integration - Integration by parts - Geometric applications - Integration of powers of trigonometric functions – Substitution - Miscellaneous and Trigonometric substitutions - Integration of rational functions in x through partial fractions - Numerical Integration - Gauss' method for the solution of linear equations - Matrix inversion and its use in the solution of linear equations.

IM 111 - Manufacturing Technology

Cr.2. Prerequisites: None

The different types of industries - production techniques - management and organization structure - the different types of hazards and dangers and how to prevent them - the meaning of production planning and control and cost calculations.

IM 112 – industrial Relations
Cr.2. Prerequisites: None

Introduction to engineering materials and their properties - production of common metals - Types of manufacturing firms - basic manufacturing processes - casting, metal forming welding and machining - An overview of some advanced manufacturing processes – Measurement – standards – instruments - deviations and methods.

CB 221- Construction Engineering Drawings
Cr.3. Prerequisites: ME151

Introduction to construction engineering as related to the overall types of Engineering projects - A brief review of the construction industry; site layout, erection of steel and concrete structures - Drawings to demonstrate the concepts of various types of civil engineering and construction projects which include: residential and industrial buildings, water resources projects, urban transportation systems, coastal development projects, and environmental protection projects - Design and construction drawings which include architectural systems, structural systems, mechanical and electrical installation. Field strips and analysis of local construction projects.

CB 251 - Testing of Materials
Cr.3. Prerequisites: None

Codes and Specifications - Classification of Engineering Materials - The Architecture of Solids - Mechanical Properties of Engineering Materials - Testing materials machinery - Axial static tension: stress- strain relationship - Static compression: test - static bending - static torsion - mechanical properties and testing - Hardness of metals - Dislocations and Strengthening Mechanism in Metals – Fracture - impact testing – Fatigue - Creep.

CB 241 - Structural Analysis 1
Cr.3. Prerequisites: BA141

Definition of a structure, its support conditions and its various structural forms in addition to various loading conditions that a structure must support. Study the stability and determinacy of structures. Calculation of reaction forces. Basic concepts of structural analysis. Calculation of the internal forces (normal forces, shear forces and bending moments) and its distribution on statically determinate beams, frames and arches. Member forces in trusses. Influence lines and its use to calculate the maximum response functions in structures.

EE 218 - Measurements & Instrumentation
Cr.3. Prerequisites: EE 238

Introduction to feedback control loop, instrument - Major specifications related to choice of measuring Instruments - Measurement of pressure - Measurement of temperature - Level measurement - Flow measurement –Viscosity - PH measurement - oxygen analyzer - Displacement and velocity measurement - Force and torque measurement - Data analysis - measures of centrality – dispersion - Strain gauges and related bridges - Study of comparators - error detectors - Transducers (Electric / pneumatic / Electro mech) - Amplifiers (electric / pneumatic)- Actuators (electric / pneumatic).

BA 224 - Mathematics 4
Cr.3. Prerequisites: BA 223

The 2D and 3D vectors – algebra - differential and integral calculus - the physical interpretation of the integral theorems - The course also gives a study on the complex functions, its differentiation and integration - the residue theorems and its application to real integrals.

BA 329 - Probability and Statistics
Cr.3. Prerequisites: BA 224

Elementary probability – Conditional probability - Independent and dependent events –Bayes Theorem - Combinatorial analysis - Discrete probability distribution – density function- Continuous probability distribution – density function - Mathematical expectation, mean and variance - Moments skewness kurtosis and moments generating function - Special discreet distribution Bernoulli - Geometric and Poisson distributions - Special continuous distribution : Uniform – negative exponential - Normal distribution- Failure – time distributions - The exponential model in reliability- The exponential model in life testing - General worked Examples.

CB 281 - Hydraulics for Civil Engineers
Cr.3. Prerequisites: BA 114

Properties of fluids and flow continuum – hydrostatics - hydrodynamic applications - flow kinematic properties and forces - flow conservation equations - continuity equation - momentum principle - energy equations - flow measurements - flow in closed/open conduits - flow in pipeline systems - pipes in series - pipes in parallel - pipeline network and pump stations - features of hydraulic analyses for the design of civil engineering projects in rivers - lakes and coastal zone.

CB 271 - Construction Surveying 1
Cr.3. Prerequisites: BA 124

Standards - Unit calibration - Measurement of distance - Linear surveying technique - Bearing calculation and measurement - Compass Traversing - Rectangular coordinates calculation - Application of practical surveying problems - Measurement of horizontal and vertical angles - Theodolite Traversing - Profile leveling - Contouring - Computation of earthwork - Layout of construction engineering projects .

CB 242 - Strength of Materials
Cr.3. Prerequisites: CB 241 & CB 251

Properties of Areas-Normal stresses - Axial stress, thermal stress and bending stresses. Shear stresses: Direct shear stress - Transverse loading and torsional stresses, Principal stresses and strains - Elastic deflection of beams - Buckling of columns.

NE 264 - Scientific Thinking
Cr.3. Prerequisites: None

Thinking Patterns Development.Meaning & Construction of Science + Scientific Values & Directions - Science, non-science & other-than science +Science - Engineering & Technology - Properties of science - Objectives of science + Postulates of scientific Thinking - Mental operations used in science + Scientific Guessing - Types of deductions + Representation - Research methods in mathematical sciences + Postulates, definitions - Research methods in natural sciences - Experiments & Observations + Scientific postulates & their conditions - Verification of scientific postulates -Problems solving + general methods of problems solving - Creative Thinking + Fluency types. Flexibility & Originality + Basics of Brain Storming.

ME 255 - Computer Aided Drafting
Cr.3. Prerequisites: CB 221

The auto basics - object construction and manipulation - geometric construction - layers and text generation - section views and hatching - dimensioning techniques - analyzing 2-D drawings - construction of blocks - isometric drawing and 3D surface modeling.

AR 411 - Architectural Design & Urban Landscape
Cr.3. Prerequisites: CB 221

The fundamentals of architectural design and landscape architecture for none architects students - the design process - the analysis of form and function - the development of an architectural project - The course focuses on the role of architect and urban planner in organizing space and time to fulfill different human needs and activities - It directs students on

how to deal with different design problems through systematic design process, and how to take into their considerations different physical, cultural, and temporal factors.

CB 343 - Structural Analysis 2
Cr.3. Prerequisites: CB 242

Introduction to statically indeterminate structures - Methods of structural analysis of statically indeterminate structures - Method of consistent deformations - Method of three-moment equation for continuous beams - Virtual work method - Slope-deflection method - Moment distribution method -Stiffness method - Computer validations.

CB 352 - Construction Materials
Cr.3. Prerequisites: CB 251

Terminology and basic geology of construction materials Physical properties (Weight , Volume relationship, Sieve Analysis, Graduation curves, and Classification) - Engineering properties - Strength and deformation characteristics - Aggregates in Construction - Hydraulic Cements - Properties of Cement Paste - Portland cement concrete (Basic ingredients, basic constituent, Proportioning of concrete mixtures) - Concrete Strength and behavior - Concrete Durability -Admixtures in Concrete – Masonry - Asphalt concrete (proportions, Mix procedures and Engineering properties).

CB 361 - Engineering Geology
Cr.3. Prerequisites: None

Earth composition. Major types of rocks and deposits. Clay minerals. Weathering conditions. Principles of structural geology. Subsurface exploration: techniques and tests. Influence of geological origin on composition and structure of soils. Index properties. Soil description and engineering classification. Permeability and capillarity.

CB 382 - Water Resources Engineering
Cr.3. Prerequisites: CB 281

Watershed hydrology and hydraulic measurements - Principles of hydrologic modeling for surface water - Introduction to ground water engineering - Design of erodible and non-erodible channels open channels - Flow characterization of lakes & reservoirs and its design engineering - Design and construction aspects of water resources structures - Dams and ancillary water supply structures -Flood-damage mitigation and storm water control structures - Planning of water resources projects and introduction to water resources management - Field visits to water resources projects and laboratory facilities.

CB 311 - Construction Management1
Cr.3. Prerequisites: None

The nature of the construction industry - participants of the construction project - management functions - organizational structures - time value of money and interest - cash flow diagram and equivalence - measures of worth, comparison of alternatives - feasibility studies - application of economic analysis principles to the construction industry.

CB 354 - Design of Reinforced Concrete Structures 1
Cr.3. Prerequisites: CB 343

Introduction and material properties - Elastic Method - Analysis and design of beams considering flexure - Limit slate Design Method - Analysis and Design of beams considering flexure and shear -Development length and anchorage - Design of one- way at two-way solid slabs - Analysis and design of short columns.

CB 312 - Systems Analysis for Construction Engineers
Cr.3. Prerequisites: None

Introduction to the mathematical models -The formulation of linear programming models - Solving of linear programming models using the graphical solution method - The simplex method - The transportation and assignment problems - Decision making under uncertainty, risk aversion, utility function - Economic considerations for resource allocation, minimum cost model - Sensitivity analysis - changes in unit costs - changes in resource constraints.

CB 322 - Building Construction
Cr.3. Prerequisites: CB 221

The course covers topics in the area of building construction in view of both aspects - construction engineering and architectural engineering. The subjects related to the construction engineering are site and temporary works – substructure and superstructure. The subject related to the architectural engineering are architectural drawings - brick works – insulation – stairs - building openings – services - and finishing materials.

CB 483 - Irrigation and Drainage
Cr.3. Prerequisites: CB 382

Application of the hydraulic & hydrologic principles to the design and construction of irrigation and drainage systems - Crop water requirements and hydrologic determination of the design flow - traditional and modern irrigation methods and systems - Types of drainage systems - hydraulics of surface drainage-ground water interface - Irrigation and drainage system design and structures.

CB 413 - Quality Control in Construction
Cr.3. Prerequisites: BA 329

Introduction to quality - Quality improvement techniques - Control charts for variables - In addition, the evaluation of strength test results of concrete, variation and analysis is presented - Quality assurance -Quality systems - ISO 9000 series - Total quality management.

CB 455 - Design of Reinforced Concrete Structures 2
Cr.3. Prerequisites: CB 354

Analysis and design of sections subjected to torsion - design of stairs, design of eccentric sections - Analysis and design of slender columns - design of frames, design of flat slabs and hollow blocks -Design of water tanks - Introduction to prestressed concrete.

CB 415 - Quantity Surveying, Cost Estimating and Specifications
Cr.3. Prerequisites: CB 322

Quantity surveying - Introduction to cost estimating in construction - Direct and indirect costs - Markups and profits - Construction bidding - Construction specification writing - types and uses.

CB 463 - Design and Construction of Earth Structures and Foundations
Cr.3. Prerequisites: CB 462

Types of foundation and selection criteria - Design of shallow and deep foundations - Construction and practical considerations - Pile-load test - Retaining structures - Sheet-pile walls - Diaphragm walls.

CB 472 - Transportation Engineering
Cr.3. Prerequisites: CB 271

Transportation systems - Individual vehicle motion - Transportation networks - Vehicle flow - Time – Space diagrams - Fundamental flow relationships - Transportation planning - Trip generation -Trip distribution - Modal choice - Network assignments - Network equilibrium - Classification of Highways - Geometric design - Horizontal alignment - Vertical alignment - intersections – interchanges - structural design of highway.

CB 444 - Design of Metallic Structures
Cr.3. Prerequisites: CB 343

Introduction to metallic structures - Structural proprieties and allowable stresses of steels - Fields of applications of steels – Loads - Planning & Bracing of steel structures - Design of axially loaded tension and compression steel members - Design of steel beams and beam-

columns - Design of steelwork connections - Steel frames - Steel bridges - Construction of steel structures.

CB 523 - Methods and Equipment for Construction 1
Cr.3. Prerequisites: CB 322

Design and construction of formwork systems - horizontal formwork - vertical formwork - Concrete technology - mixing and batching concrete - transporting concrete - placing and compacting concrete. Design and construction of dewatering systems - open sumps system – well points system - deep wells system - Design and construction of shoring systems - continuous piles system - secant piles system - diaphragm walls system – Cranes: derrick cranes - mobile cranes - tower cranes.

CB 532 - Environmental & Sanitary Engineering
Cr.3. Prerequisites: CB 382

Sources of pollution- water quality management, waste-water treatment, industrial wastes, types and disposal, solid waste management, collection and disposal, hazardous wastes.

BA 118 - Chemistry
Cr.2. Prerequisites: None

Electrechemical Reactions – Electro chemical cells.Electrochemical Series – Polarization – Passivity.Defination of Corrosion – Metals and Corrosive Environments.Forms of corrasion, uniform - Galvanic and D.A.C.Pitting corrosion - S.C.C and I.G.C.Atmospheric - Corrosion Erosion Corrosion.Coating protection and Inhibitors - Cathodic Protection.Classification of Fuel - Properties of liquid fuel - Combustion of fuelPurpose of Lubrication – Classification of Lubricants - Properties of Lubricating Oils – choice of Lubricant – Additives.Introduction – Impurities in WaterPurification and Treatment of Water.

CC 413 Numerical Analysis
Cr.3. Prerequisite: CC 111

Introducing to numerical methods and errors of computers, linear equations, Roots, Eigen vectors, Numerical differentiation , integration, interpolation,ordinary and partial differential equations .

Correlation and curve fitting prerequisites : BA224"Mathematics 4" ,CC112 "Structured programming / Credit: 3 hrs

CB 416 - Construction Management 2
Cr.3. Prerequisites: CB 311

The project life cycle and main project processes - project administration and documentation - construction productivity - value engineering, safety and health - risk management - procurement and supply chain management - sustainable construction and strategic management concepts.

CB 462 - Soil Mechanics
Cr.3. Prerequisites: CB 361

Seepage - Effective stress - Vertical stresses - Consolidation and settlement - Shear strength - Slope stability - Lateral earth pressure - Compaction - Bearing capacity. Experimental determination of soil properties - Grain size distribution - Atterberg limits -Density and Compaction – Permeability - Shear strength – Consolidation - Bearing Capacity - In situ Testing and Sampling. Soil report writing.

CB 414 - Construction Contracts and Law
Cr.3. Prerequisites: None

Principles and basics of construction contracting - Types of construction contracts - selection of construction contracts - contracts documents - project delivery systems - introduction to building and construction law - Legal aspects associated with construction projects - claims.

CB 501 - Project 1
Cr.3. Prerequisites: None

Selection of Project discipline - Assignment of Project discipline - Lecture in advanced topics - Term Project - Group presentation.

CB 503 - Project 2
Cr.6. Prerequisites: CB 501

Evaluation of students will follow college requirements - Action plan preparation - Project preparation, Final review - Project binding - Project submittal

CB 585 - Design and Construction of Coastal Structures
Cr.3. Prerequisites: CB 281

Ocean environment; wind, tides, wave mechanics - Coastal processes; surf-zone dynamics & coastal sediment transport - Wave & current forces on coastal structures - Port planning and technology - Functional design of coastal structures - Construction aspects of major coastal structures - breakwaters, seawalls, docking facilities, ocean outfalls and submarine pipelines - Field visits to local coastal protection projects.

CB 531 - Technical Installations in Buildings
Cr.3. Prerequisites: CB 322

Thermal Comfort – Heating - Ventilation & Air Conditioning (HVAC) - Central heating & cooling systems - Distribution Media - Delivery devices - Heat and Moisture transfer in buildings – Lighting - On-site power generation - Normal electrical systems - Special systems - Water supply & Drainage systems - Types of fixtures - Private sewerage systems - Fire protection systems - Architectural acoustics.

CB 517 - Techniques of Planning, Scheduling and Project Control
Cr.3. Prerequisites: CB 415

Project definition and work breakdown structure - Scheduling and control models and techniques such as: AOA, AON, bar charting -line of balance - resource allocation - time reduction. Documentation and reporting - time and cost control - progress monitoring and evaluation - computer applications.

CB 574 - Highway Design and Construction
Cr.3. Prerequisites: CB 472

Highway classification & process of location selections - Horizontal Alignment and details of geometric design - Vertical alignment and details of geometric design - Principles of traffic flow -Highway level of service (LOS) - Capacity of highway segments , multi-lane and two lanes - At grade intersection , types - Channelization - Intersection Control and traffic Signal Design - Interchanges, types, principles of design examples - Soil engineering for highway design - Bituminous Material - traffic load transformation , Equivalent Single Axle load Concept (ESAL) - Design of flexible Pavements , AASHTO method of design , BCBR method of design - Highway construction - Highway Maintenance.

CB 524 - Methods and Equipment for Construction 2
Cr.3. Prerequisites: CB 523

Engineering fundamentals of moving earth - Tractors and related equipment – tractors – bulldozers - clearing land - ripping rock – Scrapers - Excavating equipment – draglines – clamshells - hydraulic excavators – loaders - trenching machines - Trucks and wagons - Belt conveyor systems -Piles and pile-driving equipment - The production of crushed stone aggregate.

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CB 518 - Financial Management and Accounting in Construction
Cr.3. Prerequisites: CB 517

Principles of financial management and accounting - Financial statements' compilation and analysis -projecting cash flow - project financing – budgeting - cost control - introduction to cost accounting and risk-return relationship.

CB 524 - Methods and Equipment for Construction 2
Cr.3. Prerequisites: CB 523

Engineering fundamentals of moving earth - Tractors and related equipment – tractors – bulldozers - clearing land - ripping rock – Scrapers - Excavating equipment – draglines – clamshells - hydraulic excavators – loaders - trenching machines - Trucks and wagons - Belt conveyor systems -Piles and pile-driving equipment - The production of crushed stone aggregate.

CB 557 - Inspection, Maintenance, and Repair of structures
Cr.3. Prerequisites: CB 444 or CB 455

Overview of maintenance - Causes and agents of deterioration - Diagnosis and investigation techniques - Diagnosis and investigation techniques - Foundations repair, concrete defects - Repair of concrete structure - Site visit for a repair project -Other materials investigation and repair.

CC 112 - Structured Programming
Cr.3. Prerequisites: CC 111

An introduction to C-language Programming is provided in this course -Variable/Constant definitions - Basic Programmes - Sequential Programming -Conditional Programming - Looping and repetitions – Functions - Arrays as well as searching and sorting techniques

ME 523- Power Plant Operation and Management

CR: 3. Prerequisite: ME 423

Fuel handling, Piping systems, boiler codes, starting and shut down of power plant, trouble shooting, lubricating systems, load matching, load curves, effect of variable load on plant design and operation. Economics of meeting the variable loads. Plant economics. Maintenance programs

ME 524- Renewable Energy Resources

CR: 3. Prerequisite: 126 Credit Hours

This Course concentration on the theoretical and practical aspects of solar, wind, tidal and wave sources of energy. Design feasibility studies are undertaken on particular aspects of energy conversion from these resources. The impact of the environment of consumption of conventional energy forms is investigated .The nature and magnetite of energy consumption World-Wide and locally is considered

ME 526- Power Plant Measurements and Control

CR: 3. Prerequisite: EE 417

Introduction to Theory and equipment. Fuel analysis. Flue gas analysis. Types of measuring instruments (accuracy and calibration). Frequency and output measurements. Continues and remote recording equipment. Logging of data. Safety devices on plant components. Simple theory of the control of a variable control devices and systems. Introduction to microprocessor's control.

Thermodynamics and Heat Courses (ME X3X)

ME 231- Thermodynamics (Industrial and Marine)

CR: 3. Prerequisite: BA 114

Classical thermodynamics-Heat transfer by conduction, convection and radiation-Air standard cycles-Steam cycles- Gas turbine cycle-Introduction to refrigeration and air conditioning-psychrometry.