D.N.R COLLEGE OF ENGINEERING & TECHNOLOGY::BHIMAVARAM

DEPARTMENT OF CIVIL ENGINEERING

Course Outcomes

Program Name:	B.TECH	**AY**	2017-18
Course Name:	CIVIL ENGINEERING	**Class / Sem**	II/I
Faculty Name:		**Regulation**	R16

After completion of this course students will be able to:

C211	**Probability & Statistics**	**BTL**
#CO	**CO Statement**	
C211.1	**Analyze** various Probability distributions for Discrete Random Variables & Distributions	**Analyse**
C211.2	**Analyse** various Probability distributions for Continuous Random Variables & Distributions	**Analyse**
C211.3	**Illustrate** confidence intervals for the mean of a population.	**Analyse**
C211.4	**Formulate** confidence intervals for the proportion and the variance of a population and test the hypothesis concerning mean, proportion and variance.	**Create**
C211.5	**Evaluate** ANOVA test & fit a curve to the numerical data.	**Evaluate**
C211.6	**Estimate** the Statistical Quality Control using X-bar, P, R Charts	**Evaluate**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C212	**Basic Electrical & Electronics Engineering**	**BTL**
#CO	**CO Statement**	
C212.1	**Describe** the various electrical networks	**Remember**
C212.2	**Understand** the operation of DC generators,3-point starter and **Conduct** the Swinburne's Test.	**Apply**
C212.3	**Analyse** the performance of transformer	**Analyse**
C212.4	**Assess** the operation of 3-phase alternator and 3-phase induction motors	**Evaluate**
C212.5	**Analyse** the operation of half wave, full wave rectifiers and OP-AMPs.	**Analyse**
C212.6	**Explain** the single stage CE amplifier and concept of feedback amplifier	**Understand**

Blooms Taxonomy: Remember, Understand, Analyse, Evaluate.

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After completion of this course students will be able to:

C213	**Strength of Materials-I**	**BTL**
#CO	**CO Statement**	
C213.1	**Understand** the basic materials behavior under the influence of different externalloading conditions and the support conditions.	**Understand**
C213.2	**Outline** the relationship between bending moment, shear force and rate of loadingwith the help of diagrams.	**Analyse**
C213.3	**Apply** the theory of simple bending to beams for computing the flexural strengthacross the section.	**Apply**
C213.4	**Apply** the theory of simple bending to beams for computing the shear stress acrossthe section	**Apply**
C213.5	**Evaluate** the Slopes and Deflections in beams and trusses subjected to variousload combinations using energy methods.	**Evaluate**
C213.6	**Apply** fluid pressure concepts for computing circumferential and longitudinalstresses and strains on thick and thin-walled cylinders.	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C214	**Building Materials & Construction**	**BTL**
#CO	**CO Statement**	
C214.1	**Identify** different building materials and their importance in building construction**.**	**Remember**
C214.2	**Categorize** brick masonry, stone masonry construction	**Analyse**
C214.3	**Use** Lime and Cement in various construction activities	**Apply**
C214.4	**Contrast** Building Components like arches, Trusses and lintel.	**Analyse**
C214.5	**Evaluate** the importance of building components and finishings.	**Evaluate**
C214.6	**Identify** the classification of aggregates, sieve analysis and moisture contentusually required in building construction.	**Remember**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C215	**Surveying**	**BTL**
#CO	**CO Statement**	
C215.1	**Operate** and use surveying equipment.	**Apply**
C215.2	**Sketch** plan or map of the existing permanent features on the ground.	**Apply**
C215.3	**Classify** the ground features from the map or plan.	**Analyse**
C215.4	**Analyse** temporary adjustments and check permanent adjustments of theTheodolite	**Analyse**
C215.5	**Derive** different types of Curves & know their applications	**Create**
C215.6	**Evaluate** Construction Survey & Various Space Based Positioning System.	**Evaluate**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C216	**Fluid Mechanics**	**BTL**
#CO	**CO Statement**	
C216.1	**Understand** Various Properties Of Fluids And Their Influence On Fluid Motion and **Analyse** Variety of Problems in Fluid Statics And Dynamics.	**Analyse**
C216.2	**Calculate** The Forces that Act on Submerged Planes and Curves.	**Apply**
C216.3	**Analyse** Various types Of Fluid Flows & draw simple hydraulic and energygradient lines.	**Analyse**
C216.4	**Apply** Integral Forms of 3 Fundamental Laws of Fluid Mechanics to TurbulentAnd Laminar Flow to Predict Relevant Pressures, Velocities and Forces.	**Apply**
C216.5	**Measure** the quantities of Fluid Flowing In Pipes, Tanks And Channels.	**Evaluate**
C216.6	**Illustrate** the Concept of Boundary Layer To Practical Situations.	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C217	**Survey Field Work – I**	**BTL**
#CO	**CO Statement**	
C217.1	**Apply** standard Practices to perform chain survey in the field and to plot fromfield data	**Apply**
C217.2	**Apply** Principles to Perform compass survey and plot from field data	**Apply**
C217.3	**Apply** basics of plane table survey for making plans and calculating areas	**Apply**
C217.4	**Apply** basic techniques and engineering tools for leveling.	**Apply**
C217.5	**Apply** knowledge of levelling in Longitudinal and cross sectioning for the givenalignment	**Apply**
C217.6	**Explain** the methods of levelling and chaining.	**Understand**

Blooms Taxonomy: Analyse, understand.

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After completion of this course students will be able to:

C218	**Strength of Materials Lab**	**BTL**
#CO	**CO Statement**	
C218.1	**Evaluate** the values of Tensile and compressive stresses of the given specimen.	**Evaluate**
C218.2	**Analyse** stress of various beams subjected to bending loads.	**Analyse**
C218.3	**Examine** the stiffness of the open coil and closed coil spring.	**Apply**
C218.4	**Evaluate** the capacity of a material to withstand torsional and shearing stresses.	**Evaluate**
C218.5	**Determine** the hardness, impact strength to analyze the application of a specific material.	**Apply**
C218.6	**Determine** the of stress, strain, deformation of material under different types of loading.	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Apply .

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After completion of this course students will be able to:

C221	**Building Planning & Drawing**	**BTL**
#CO	**CO Statement**	
C221.1	**Understand** Bye Laws & Regulations for Constructing a Building.	**Understand**
C221.2	**Illustrate** the relation between the plan, elevation and cross section.	**Apply**
C221.3	**Paraphrase** the form and functions among the buildings.	**Understand**
C221.4	**Compare** between English & Flemish Bonds.	**Evaluate**
C221.5	**Sketch** types of doors, windows, Ventelators & Roofs on Drawing Sheet.	**Apply**
C221.6	**Create** a plan for various buildings as per the building by-laws	**Create**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C222	**Strength of Materials - II**	**BTL**
#CO	**CO Statement**	
C222.1	**Calculate** principal stresses, strains, and Theories of failures in the materials.	**Apply**
C222.2	**Apply** the torsion equation to springs, solid and hollow circular shafts forcomputing torsional stiffness of springs and power transmitted by shafts.	**Apply**
C222.3	**Derive** buckling of columns and struts under axial loading for understandingthe behavior of column	**Create**
C222.4	**Determine** the Direct and Bending Stresses in the case of chimneys, retainingwalls and dams	**Apply**
C222.5	**Calculate** the Deflection of beams under unsymmetrical bending and determineshear center for various cross sections.	**Apply**
C222.6	**Assess** forces in different types of trusses used in construction.	**Evaluate**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C223	**Hydraulics & Hydraulic Machinery**	**BTL**
#CO	**CO Statement**	
C223.1	**Solve** uniform and non uniform open channel flow problems.	**Apply**
C223.2	**Outline** the Ideas and Importance of Critical Flow Parameters	**Analyse**
C223.3	**Examine** the Principles of Dimensional Analysis For building The RelationshipBetween Model And Prototypes.	**Apply**
C223.4	**Illustrate** the Similitude Concept for Testing of Engineering Models	**Apply**
C223.5	**Examine** the Principles of Dimensional Analysis and Similitude In HydraulicModel Testing.	**Apply**
C223.6	**Assess** the Working Principles of Various Hydraulic Machinery and Pumps.	**Evaluate**

Blooms Taxonomy: Apply, Analyse, Evaluate.

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After completion of this course students will be able to:

C224	**Concrete Technology**	**BTL**
#CO	**CO Statement**	
C224.1	**Illustrate** the basic physical and chemical properties of construction materialsfor determining quality of concrete.	**Analyse**
C224.2	**Evaluate** the most economical and eco-friendly concrete mix based on standardmethods for producing quality of concrete	**Evaluate**
C224.3	**Determine** the workability and manufacturing process of concrete for obtainingeconomical and durable concrete.	**Apply**
C224.4	**Analyse** the impact of water/cement ratio on strength and durability of concreteby measuring its hardened strength by compressive, tensile and flexural strengths	**Analyse**
C224.5	**Apply** the knowledge of mechanical properties of concrete like Elasticity,Creep & Shrinkage in the designing of the concrete structures.	**Apply**
C224.6	**Examine** special concretes and new generation concrete for satisfying thefuture needs of industry in real time	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C225	**Structural Analysis – I**	**BTL**
#CO	**CO Statement**	
C225.1	**Differentiate** between the determinate and indeterminate structures.	**Understand**
C225.2	**Analyse** the behaviour of structures due to the expected loads, including themoving loads, acting on the structure.	**Analyse**
C225.3	**Evaluate** the bending moment and shear forces in beams for different fixityconditions.	**Evaluate**
C225.4	**Analyse** the continuous beams using various methods -, three moment method,slope deflection method, energy theorems.	**Analyse**
C225.5	**Construct** the influence line diagrams for various types of moving loads onbeams/bridges.	**Create**
C225.6	**Analyse** the loads in Pratt and Warren trusses when loads of different types andspans are passing over the truss.	**Analyse**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C226	**Transportation Engineering - I**	**BTL**
#CO	**CO Statement**	
C226.1	**Infer** highway network Plan for a given area.	**Analyse**
C226.2	**Determine** Highway alignment and design highway geometrics	**Apply**
C226.3	**Design** Intersections and prepare traffic management plans	**Create**
C226.4	**Judge** suitability of pavement materials.	**Evaluate**
C226.5	**Design** the flexible pavement and rigid pavement of Highway.	**Create**
C226.6	**Illustrate** Construction and maintainance of highways	**Analyse**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C227	**FM & HM Lab**	**BTL**
#CO	**CO Statement**	
C227.1	**Analyze** the flow discharge through venturi meter an orifice meter	**Analyse**
C227.2	**Determine** the rate of flow through notches	**Apply**
C227.3	**Determine** minor losses in the pipes	**Apply**
C227.4	**Apply** the principles of Bernoulli's equation in measurement of discharge inpipes, and in other pipe flow problems	**Apply**
C227.5	**Evaluate** the impact of jets on different vanes	**Evaluate**
C227.6	**Evaluate** the performance characteristics of hydraulic turbines and pumps	**Evaluate**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C228	**Survey Field Work - II**	**BTL**
#CO	**CO Statement**	
C228.1	**Apply** the knowledge of Theodolite in different operations in civil engineeringprojects.	**Apply**
C228.2	**Apply** the knowledge of principles and purpose of Tacheometry in findingout the constants.	**Apply**
C228.3	**Construct** the Simple Curve by using different methods and to plot from fielddata.	**Create**
C228.4	**Calculate** areas, drawing planes and contour maps using different measuringequipment at field level.	**Apply**
C228.5	**Calculate** the area and heights using total station in the field	**Apply**
C228.6	**Apply** the knowledge of Total station in different operations of Traversing &Contouring.	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C229	**Managerial Economics & Financial Analysis**	**BTL**
#CO	**CO Statement**	
C229.1	**Compare** the Demand and Demand Elasticities for a product	**Analyse**
C229.2	**Evaluate** the Input-Output-Cost relationships and estimation of the least costcombination of inputs	**Evaluate**
C229.3	**Understand** the nature of different markets and determine price outputdetermination under various market conditions	**Understand**
C229.4	**Describe** different Business Units, market structures, pricing strategies	**Understand**
C229.5	**Formulate** Financial Statements and the Usage of various accounting tools forAnalysis	**Analyse**
C229.6	**Evaluate** various investment project proposals with the help of capitalBudgeting techniques for decision making	**Evaluate**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C311	**Engineering Geology**	**BTL**
#CO	**CO Statement**	
C311.1	**Explain** basic concepts, common rocks, minerals, their significance andapplication in civil engineering.	**Understand**
C311.2	**Testing** of geological material to check the suitability.	**Analyse**
C311.3	**Recognize** tectonic effects, Geological structures and their significance in CivilEngineering.	**Understand**
C311.4	**Classify**, monitor and measure the Landslides and subsidence	**Analyse**
C311.5	**Analyses** the ground conditions through geophysical surveys	**Analyse**
C311.6	**Investigate** the project site for mega/mini civil engineering projects.Siteselection for mega engineering projects like Dams, Tunnels	**Analyse**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C312	**Structural Analysis – II**	**BTL**
#CO	**CO Statement**	
C312.1	**Analyse** two and three hinged arches and its application.	**Analyse**
C312.2	**Analyse** lateral Loads of structures & drawing SFD & BMD.	**Analyse**
C312.3	**Analyse** Cable and Suspension Bridge structures	**Analyse**
C312.4	**Illustrate** concept of static and kinematic indeterminacy, slope and deflection ofdeterminate and indeterminate beams for analysis of structures.	**Apply**
C312.5	**Evaluate** structures using Moment Distribution, Kani's Method andMatrix methods	**Evaluate**
C312.6	**Analyse** indeterminate beams structures and frames.	**Analyse**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C313	**Design and Drawing of Reinforced Concrete Structures**	**BTL**
#CO	**CO Statement**	
C313.1	**Apply** Fundamental Concepts Of Limit State Method And Working StressMethods	**Apply**
C313.2	**Analyse** The Structural Behavior Of Reinforced Concrete Elements In Bending,Shear, Compression And Torsion	**Analyse**
C313.3	**Design** a structures Subjected To Shear, Bond And Torsion	**Create**
C313.4	**Design** Different type Of Compression Members subjected to different Loading	**Create**
C313.5	**Design** Different type Of Footings subjected to different Loading Conditions	**Create**
C313.6	**Analyse** & **Design** different types of Slabs	**Create**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C314	**Geotechnical Engineering – I**	**BTL**
#CO	**CO Statement**	
C314.1	**Assess** Soil Structure & Clay Mineralogy & Understand Compaction & its Mechanism.	**Evaluate**
C314.2	**Classify** various types of Soil using different Concepts & Understand different Consistency Limits & Indices.	**Analyse**
C314.3	**Impart** the Concept of Seepage of The Water through Soils and **Determine** the Permeability of Water Through Soils.	**Apply**
C314.4	**Analyse** Boussinesq & Westergaad's theories for Stress Distribution in Soils.	**Analyse**
C314.5	**Impart** concept of Consolidation of Soils and **Determine** the Rate & degrre of Consolidation.	**Apply**
C314.6	**Determination** of Shear Strength of Soils using Mohr's Coulomb failure Theories &Stress-Strain behaviour of Sand & Clay.	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C315	**Transportation Engineering – I**	**BTL**
#CO	**CO Statement**	
C315.1	**Identify** the importance of highway development of India and C**lassification** ofroads and road patterns.	**Analyse**
C315.2	**Analyse** the various geometric elements like curves, gradients, super elevationetc.	**Analyse**
C315.3	**Examine** various traffic surveys and study basics of traffic engineering andregulations of various roads.	**Apply**
C315.4	**Analyse** the desirable properties of highWay Materials.	**Analyse**
C315.5	**Design** the flexible pavement and rigid pavement of Highway.	**Create**
C315.6	**Illustrate** Construction and maintainance of highways	**Analyse**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C316	**IPR & Patents**	**BTL**
#CO	**CO Statement**	
C316.1	**Outline** the significance of practice and procedure of Patents.	**Analyse**
C316.2	**Understand** the statutory provisions of different forms of IPRs in simple forms.	**Understand**
C316.3	**Assess** the procedure of obtaining Patents, Copyrights, Trade Marks &Industrial Design	**Evaluate**
C316.4	**Outline** types of Intellectual Properties (IPs), the right of ownership, scope ofprotection as well as the ways to create and to extract value from IP.	**Analyse**
C316.5	**Estimate** the crucial role of IP in organizations of different industrial sectors forthe purposes of product and technology development.	**Evaluate**
C316.6	**Analyse** the Framework of Strategic Management of Intellectual Property (IP).	**Analyse**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C317	**Geotechnical Engineering Lab**	**BTL**
#CO	**CO Statement**	
C317.1	**Evaluate** the different types of soil and their engineering properties and classifythem.	**Evaluate**
C317.2	**Evaluate** the different types of soil and their Index properties and classify them.	**Evaluate**
C317.3	**Determine** the soil properties in laboratory and develop a proficiency inhandling experimental data.	**Apply**
C317.4	**Analyse** engineering properties like compaction, permeability, soil shearstrength.	**Analyse**
C317.5	**Analyse** the Compression test results from Triaxial and UnconfinedCompression test.	**Analyse**
C317.6	**Perform** CBR test and **Analyse** the test results for different test conditions.	**Analyse**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C318	**ENGINEERING GEOLOGY LAB**	**BTL**
#CO	**CO Statement**	
C318.1	**Test** different Minerals to Identify their Mega-scopic properties.	**Evaluate**
C318.2	**Test** different Rocks to Identify their Mega-scopic properties.	**Evaluate**
C318.3	**Identify** the site parameters such as contour, slope & aspect for topography.	**Understand**
C318.4	**Analyse** the Occurance of strike & dip on the ground	**Analyse**
C318.5	**Assess** geological maps showing tilted beds, faults, unconformities.	**Evaluate**
C318.6	**Deterimine** the Strength of Rock using Laboratory Tests.	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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DEPARTMENT OF CIVIL ENGINEERING

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After completion of this course students will be able to:

C321	**Design and Drawing of Steel Structures**	**BTL**
#CO	**CO Statement**	
C321.1	**Analyse** various Indian Standard codes and its application in design steelstructure.	**Analyse**
C321.2	**Analysis** and D**esign** of flexural members and detailing them.	**Create**
C321.3	**Design** compression & Tension members of different types with connectiondetailing	**Create**
C321.4	**Design** eccentrically loaded column and column bases	**Create**
C321.5	**Design** Plate Girder and Gantry Girder with connection detailing	**Create**
C321.6	**Sketch** the drawings pertaining to different components of steel structures	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C322	**Geotechnical Engineering – II**	**BTL**
#CO	**CO Statement**	
C322.1	**Investigate** Soil Exploration Methods & prepare soil Investigation report.	**Apply**
C322.2	**Analyse** different theories of Earth pressure in different soil conditions.	**Analyse**
C322.3	**Categorize** the various types of shallow foundations and decide on theirlocation based on soil characteristics.	**Analyse**
C322.4	**Judge** the magnitude of foundation settlement and decide on the size of thefoundation accordingly.	**Evaluate**
C322.5	**Apply** the principles of bearing capacity of piles and design them accordingly.	**Apply**
C322.6	**Determine** Design Criteria and Construction parameters for Well Foundation	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C323	**Water Resources Engineering–I**	**BTL**
#CO	**CO Statement**	
C323.1	**Interpret** the components of Water Cycle & its measurement for Evolving theeffects of Hydrology.	**Understand**
C323.2	**Illustrate** the factors effecting the rate of Evaporation & Infiltration forreducing the water loss in the Environment.	**Apply**
C323.3	**Develop** hydrographs for the Rainfall-Runoff data to design Storage Capacity &Life of Reservoirs.	**Create**
C323.4	**Estimate** the Floof Magnitude & carry out Floof Routing.	**Apply**
C323.5	**Examine** different Aquifer properties & their uses for Construction of Well.	**Apply**
C323.6	**Examine** the Rainfall- Runnoff Models for the advance Computation ofHydrograph.	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C324	**Environmental Engineering – I**	**BTL**
#CO	**CO Statement**	
C324.1	**Estimate** Water demand and Population Forcasting using different Methods.	**Apply**
C324.2	**Illustrate** the Water conveyance & design aspects of Pipe lines.	**Apply**
C324.3	**Analyse** the Charcteristics of water and compare them with IS standards.	**Analyse**
C324.4	**Describe** and **design** of Coagulation, Flocculation processes and Filtration.	**Create**
C324.5	**Evaluate** disinfection processes, water softening methods, demineralization,fluoridation and defluoridation.	**Evaluate**
C324.6	**Describe** and **Design** parts of water distribution systems	**Create**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C325	**Transportation Engineering – II**	**BTL**
#CO	**CO Statement**	
C325.1	**Design** geometrics of a railway track.	**Create**
C325.2	**Provide** good transportation network	**Understand**
C325.3	**Contrast** Turnouts & interlockings in Railway Track	**Analyse**
C325.4	**Design** Airport Geometrics and understand Airport Masterplan	**Create**
C325.5	**Design** Airport Runway and also evaluate its strengthy.	**Create**
C325.6	**Illustrate** Planning, construction and maintainance of Docks and Harbours.	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C326	**OPEN ELECTIVE - Environmental Pollution and Control**	**BTL**
#CO	**CO Statement**	
C326.1	**Infer** the air pollutant control devices & have knowledge on the NAAQstandards and air emission standards.	**Analyse**
C326.2	**Infer** the Noise pollutant control methods & have knowledge on the ISO14000Standards.	**Analyse**
C326.3	**Categorize** treatment techniques used for sewage and industrial wastewatertreatment methods	**Analyse**
C326.4	**Apply** the fundamentals of solid waste management, practices adopted and itsimportance in keeping the health of the city.	**Apply**
C326.5	**Evaluate** the methods of environmental sanitation and the management ofcommunity facilities without spread of epidemics.	**Evaluate**
C326.6	**Appreciate** the importance of sustainable development while planning a projector executing an activity.	**Understand**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C327	**Computer Aided Engineering Drawing**	**BTL**
#CO	**CO Statement**	
C327.1	**Draw** Projections of solids inclined to both planes on Paper	**Create**
C327.2	**Develop** Surfaces of Right Regular Solids & Interpenetrate them.	**Create**
C327.3	**Develop** Isometric & Perspective projections and Transform them.	**Create**
C327.4	**Develop** the components using 2D and 3D wire frame models through variousediting commands.	**Create**
C327.5	**Understand** & use various modelling techniques such as edit, zoom, crosshatching, pattern filling,rotation,etc.	**Understand**
C327.6	**Generate** assembly of various components of compound solids.	**Create**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C318	**Transportation Engineering Lab**	**BTL**
#CO	**CO Statement**	
C318.1	**Determine** engineering properties of Road aggregates.	**Apply**
C318.2	**Determine** index properties of Road aggregates.	**Apply**
C318.3	**Examine** the grade & properties of bitumen.	**Apply**
C318.4	**Outline** the various properties of bitumen material and mixes by performingvarious tests on it	**Analyze**
C318.5	**Calculate** the design speed, maximum speed and minimum speed limits of alocation through spot speed.	**Apply**
C318.6	**Evaluate** the strength of subgrade soil by CBR test.	**Evaluate**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C411	**Environmental Engineering – II**	**BTL**
#CO	**CO Statement**	
C411.1	**Determine** the sewage characteristics and comprehend the quality and quantityof sewage.	**Apply**
C411.2	**Choose** The Appropriate Appurtenances In The Sewerage Systems	**Evaluate**
C411.3	**Analyse** Sewage And Suggest And Design Suitable Treatment System ForSewage Treatment	**Analyse**
C411.4	**Design** secondary treatment units along with activated sludge process andtrickling filters.	**Create**
C411.5	**Design** a Septic tank and understand the working & disposal mechanism of itseffluents.	**Create**
C411.6	**Understand** the Sludge Characteristics & Effective Handeling of it.	**Understand**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C412	**Prestressed Concrete**	**BTL**
#CO	**CO Statement**	
C412.1	**Understand** the Basic concept of Prestressing along with its Types &Characteristics.	**Understand**
C412.2	**Analyse** a Prestressed Member and can draw its Stress diagram	**Analyse**
C412.3	**Calculate** the Total Losses of Pre-stressing in the member due to variousCauses.	**Apply**
C412.4	**Design** for Flexural resistance along with knowledge about Deflection Control.	**Create**
C412.5	**Design** for Shear & Torsion as per Codal Provisions.	**Create**
C412.6	**Analyse** End Zone & Anchorage Zone Reinforcement in Prestressed Member.	**Analyse**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C413	**Construction Technology and Management**	**BTL**
#CO	**CO Statement**	
C413.1	**Understand** the basic Qualities of a Project Manager along with the study ofdifferent Charts.	**Understand**
C413.2	**Illustrate** Resourse Allocation & review Project Evaluation.	**Apply**
C413.3	**Outline** the functioning of various earthwork equipment and their handeling.	**Analyse**
C413.4	**Outline** the functioning of various Conctrete equipment and their handeling.	**Analyse**
C413.5	**Evaluate** Various Construction Methods at different stages of Construction.	**Evaluate**
C413.6	**Infer** Quality Control and Safety noms while performing Construction activity.	**Analyse**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C414	**Water Resources Engineering–II**	**BTL**
#CO	**CO Statement**	
C414.1	**Estimate** Irrigation Water Requirements & Irrigation Efficiencies.	**Evaluate**
C414.2	**Design** Irrigation Canals And Canal Network while Considering differentTheories.	**Create**
C414.3	**Design** of Canal Structures like Falls, Regulators, Cross Drainage Works etc.	**Create**
C414.4	**Evaluate** various Theories used to design Diversion Head Works.	**Evaluate**
C414.5	**Analyse** stability of gravity and earth dams	**Analyse**
C414.6	**Design** ogee spillways and energy dissipation works.	**Create**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C415	**Remote Sensing and GIS Applications**	**BTL**
#CO	**CO Statement**	
C415.1	**Understand** and be familiar With Ground, Air And Satellite Based SensorPlatforms	**Understand**
C415.2	**Analyse** and Interpret The Aerial Photographs And Satellite Imageries	**Analyse**
C415.3	**Create** and Input Spatial Data For GIS Application	**Create**
C415.4	**Apply** RS And GIS Applications In General	**Apply**
C415.5	**Apply** RS And GIS Concepts In Water Resources Engineering	**Apply**
C415.6	**Understand** the principles of spatial analysis	**Understand**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C416	**ELECTIVE-I - GROUND IMPROVEMENT TECHNIQUES**	**BTL**
#CO	**CO Statement**	
C416.1	**Outline** purpose of ground improvement techniques to obtain the suitableconstruction site for long-lasting structures	**Analyse**
C416.2	**Illustrate** the various methods of ground improvement techniques to increaseload bearing capacity of beneath and surface soils.	**Apply**
C416.3	**Determine** importance of admixtures and its composition for injecting thematerial into the soils	**Apply**
C416.4	**Analyse** the practical applications of reinforced soil and grid reinforced soils forbetter strength and durability of soils	**Analyse**
C416.5	**Outline** various functions of Geosynthetics and their applications in CivilEngineering practice.	**Analyse**
C416.6	**Illustrate** various grouting techniques and its applications for improving loadbearing of beneath soils	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C417	**Environmental Engineering Lab**	**BTL**
#CO	**CO Statement**	
C417.1	**Estimate** the characteristics of water, waste water and soil in the laboratory.	**Evaluate**
C417.2	**Decide** whether the water is Potable or not.	**Evaluate**
C417.3	**Estimate** Chloride, EC and Salinity of Soil and suggest their suitability for Construction/Agriculture.	**Evaluate**
C417.4	**Estimate** the pollution characteristics of waste water by analyzing DO, BODand COD.	**Evaluate**
C417.5	**Calculate** the amount of coagulant required for optimum sedimentation for agiven Turbid sample.	**Apply**
C417.6	**Assess** physical parameters of water as turbidity and colour.	**Evaluate**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C418	**GIS & CAD Lab**	**BTL**
#CO	**CO Statement**	
C418.1	**Create** and digitize the thematic map and extract important features	**Create**
C418.2	**Develop** digital elevation model	**Create**
C418.3	**Analyse** and design 2D & 3D trusses using structural analysis software	**Analyze**
C418.4	**Analyse** and design 2D & 3D frames using structural analysis software	**Analyze**
C418.5	**Design** and Analyse retaining wall using CADD software	**Create**
C418.6	**Design** and Analyse simple towers using CADD software	**Create**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C421	**Estimating, Specifications & Contracts**	**BTL**
#CO	**CO Statement**	
C421.1	**Explain** terms related to estimation along with preparation of approximateestimate.	**Understand**
C421.2	**Outline** Rate Analysis with Working out data for various Items.	**Analyse**
C421.3	**Create** Bar Bending Schedule for the given structure.	**Create**
C421.4	**Examine** contracts, types of contract and conditions of contract	**Apply**
C421.5	**Conclude** the quantities to prepare the detailed estimate	**Evaluate**
C421.6	**Develop** Detailed Estimation of a Building using different methods.	**Create**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C422	**ELECTIVE-II - ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT**	**BTL**
#CO	**CO Statement**	
C422.1	**Understand** the role of stakeholder and public hearing in the preparation of EIA	**Understand**
C422.2	**Choose** appropriate EIA methodology for Impact assessment.	**Evaluate**
C422.3	**Apply** RS & GIS for the Assessment of Soil & Ground water	**Apply**
C422.4	**Assess** the Impact Significance & Identification of Mitigation Measures.	**Evaluate**
C422.5	**Analyse** the Risk Assessment and management.	**Analyse**
C422.6	**Prepare** EMP, EIS & EIA Reports & evaluation the EIA report	**Create**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C423	**ELECTIVE-III - Solid Waste Management**	**BTL**
#CO	**CO Statement**	
C423.1	**Determine** various collection methods and routes of solid wastes	**Apply**
C423.2	**Design** storage ,collection, transport, processing, and disposal of solid wastes	**Create**
C423.3	**Choose** various storage and processing methods and ability to selectappropriate method for a specific scenario	**Evaluate**
C423.4	**Categorise** various Unit Operations for transformation of Soild Waste.	**Analyse**
C423.5	**Choose** various Energy & Material Recovery methods.	**Evaluate**
C423.6	**Apply** various disposal methods and post disposal effects of municipal solidwastes	**Apply**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C424	**ELECTIVE-IV - Repair and Rehabilitation of Structures**	**BTL**
#CO	**CO Statement**	
C424.1	**Explain** about types of deterioration of concrete in structures	**Understand**
C424.2	**Carryout** & **analysis** various NDT tests and evaluate structures	**Analyse**
C424.3	**Assess** types of failures and causes of failures in structures	**Evaluate**
C424.4	**Carryout** Physical evaluation and submit report on condition of the structure	**Evaluate**
C424.5	**Determine** various Repairing Techniques both on Ground and Under water.	**Apply**
C424.6	**Investigate** distress in various types of structures.	**Analyse**

Blooms Taxonomy: Analyse, Evaluate, Create.

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After completion of this course students will be able to:

C425	**Project Work**	**BTL**
#CO	**CO Statement**	
C425.1	**Identify** thrust area in civil engineering and finalize problem statement.	**Remember**
C425.2	**Review** the literature to search for technical information from various resourceson selected problem.	**Understand**
C425.3	**Formulate** the appropriate solution methodology.	**Analyse**
C425.4	**Apply** all levels of Engineering knowledge for solving the problems.	**Apply**
C425.5	**Apply** the principles, tools and techniques to solve the problem.	**Apply**
C425.6	**Work** in a group as a part of multidisciplinary team with professionalresponsibility	**Apply**
C425.7	**Analysis** and design of structure to meet desired needs within realisticconstraints.	**Analyse**
C425.8	**Plan** activity schedule and implementation in a given time span.	**Evaluate**
C425.9	**Prepare** a report and presentation of project.	**Create**

Blooms Taxonomy: Analyse, Evaluate, Create.

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