RAMIREDDY SUBBARAMI REDDY ENGINEERING COLLEGE

(Approved by AICTE, Affiliated to JNTUA. An ISO 9001: 2015 Certified Institution)

NH-16, Kadanuthala, Bogole Mandal, Kavali- 524 142, S.P.S.R. Nellore, Andhra Pradesh.)

DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOMES (COS) OF ALL COURSES FRAMED UNDER JNTUA-R15 REGULATION

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DEPARTMENT OF CIVIL ENGINEERING

INDEX

List of all courses offered by the institution for the regulation R15, JNTUA

I B.Tech. - I Semester

S.No	Course code	Subject
1.	15A52101	Functional English
2.	15A54101	Mathematics – I
3.	15A05101	Computer Programming
4.	15A56101	Engineering Physics
5.	15A03101	Engineering Drawing
6.	15A52102	English Language Communication Skills Lab
7.	15A56102	Engineering Physics Lab
8.	15A05102	Computer Programming Lab

I-II Semester

S.No	Course code	Subject
1.	15A52201	English for Professional Communication
2.	15A54201	Mathematics – II
3.	15A01201	Engineering Mechanics
4.	15A51101	Engineering Chemistry
5.	15A01101	Environmental Studies
6.	15A01202	Applied Mechanics Lab
7.	15A51102	Engineering Chemistry Lab
8.	15A99201	Engineering & IT Workshop

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II B. Tech – I Sem

S.No.	Course Code	Subject
1	15A54301	Mathematics - III
2	15A01301	Electrical and Mechanical Technology
3	15A01302	Building Materials and Construction
4	15A01303	Strength of Materials – I
5	15A01304	Surveying – I
6	15A01305	Fluid Mechanics
7	15A01306	Surveying Laboratory – I
8	15A01307	Strength of Materials Laboratory

II B. Tech – II Sem

S.No.	Course Code	Subject
1	15A54401	Probability and Statistics
2	15A52301	Managerial Economics & Financial Analysis
3	15A01401	Strength of Materials – II
4	15A01402	Surveying – II
5	15A01403	Structural Analysis – I
6	15A01404	Hydraulics & Hydraulic Machinery
7	15A01405	Fluid Mechanics & Hydraulic Machinery Laboratory
8	15A01406	Surveying Laboratory – II
9	15A01407	Comprehensive Online Examination-I

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DEPARTMENT OF CIVIL ENGINEERING

B.Tech III-I Semester (C.E)

S. No.	Course Code	Subject
1.	15A01501	Design and Drawing of RCC Structures
2.	15A01502	Estimation, Costing and Valuation
3.	15A01503	Geotechnical Engineering – I
4.	15A01504	Engineering Geology
5.	15A01505	Structural Analysis – II
6.	15A01506 15A01507	**MOOCS-I*** 1. Cost Effective Housing Techniques 2. Water Harvesting and Conservation
7.	15A01508	Engineering Geology Laboratory
8.	15A01509	Geotechnical Engineering Laboratory
9.	15A99501	Audit course - Social Values & Ethics

B.Tech III-II Semester (C.E)

S. No.	Course Code	Subject
1.	15A01601	Concrete Technology
2.	15A01602	Design and Drawing of Steel Structures
3.	15A01603	Geotechnical Engineering – II
4.	15A01604	Transportation Engineering - I
5.	15A01605	Water Resources Engineering – I
6.	15A01606 15A01607 15A01608	**CBCC-I** 1. Remote Sensing & GIS 2. Disaster Management & Mitigation 3. Intellectual Property Rights
7.	15A01609	Concrete Technology Laboratory
8.	15A01610	Transportation Engineering Laboratory
9.	15A52602	Advanced English Language Communication Skills (AELCS) Laboratory (Audit Course)
10.	15A01611	Comprehensive Online Examination-II

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DEPARTMENT OF CIVIL ENGINEERING

B.Tech IV-I Semester (C.E)

S. No.	Course Code	Subject
1.	15A01701	Finite Element Methods
2.	15A01702	Transportation Engineering - II
3.	15A01703	Environmental Engineering
4.	15A01704	Water Resources Engineering – II
5.	 15A01705 15A01706 15A01707	**CBCC-II** 1. Design and Drawing of Irrigation Structures 2. Ground Improvement Techniques 3. Air Pollution and Quality Control
6.	 15A01708 15A01709 15A01710	**CBCC-III** 1. Bridge Engineering 2. Earth Quake Resistant Design of Structures 3. Rehabilitation and Retrofitting of Structures
7.	15A01711	CAD Laboratory
8.	15A01712	Environmental Engineering Laboratory

B.Tech IV-II Semester (C.E)

S. No.	Course Code	Subject
1.	 15A01801 15A01802	**MOOCS – II*** 1. Urban Transportation Planning 2. Advanced Structural Engineering
2.	 15A01803 15A01804	**MOOCS – III*** 1. Prestressed Concrete 2. Environmental Impact Assessment and Management
3.	15A01805	Comprehensive Viva Voce
4.	15A01806	Technical Seminar
5.	15A01807	Project Work
6.	15A01808	Survey Camp**

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DEPARTMENT OF CIVIL ENGINEERING

R15- COURSE OUTCOME

YEAR & SEM	SUBJECT CODE	SUBJECT NAME	CO	COURSE OUTCOME
I-I	15A52101	Functional English	52101.1	Acquire good listening skills to participate effectively in group discussions, debates, and interviews and writing skills for effective technical report writing. (BTL-2)
			52101.2	Develop oral communication skills in English to speak fluently in various academic and social situations. (BTL-3)
			52101.3	Identify deviant use of English both in spoken and written forms, and improve awareness of its in science and technology. (BTL-2)
			52101.4	Understand the importance of reading for life, and career and thereby develop an interest for it. (BTL-2)
			52101.5	Demonstrate fundamental skills required for critical thinking. (BTL-2)
I-I	15A54101	Mathematics-I	54101.1	Solve the First, Second and Higher order D.Es and Applications of First Order D.E (BTL3)
			54101.2	Attain the knowledge of Applications of L.D.Es like Mechanical & Electrical Oscillatory circuits and deflection of beams (BTL2)
			54101.3	Familiarize with functions of several variables which is useful in Optimizations. (BTL6)
			54101.4	Determine important tools of calculus in Higher Dimensions (Multiple Integrals) (BTL5)

			54101.5	Become familiar with the applications of vector calculus to Engineering Problems. (BTL6)
I-I	15A05101	Computer Programming	5101.1	To explain the basic concepts of problem solving aspect, algorithms, flowcharts and SDLC (BTL2)
			5101.2	To implement C program statements, Two-way selection, Multi-way selection, Loop control statements and other related statements.(BTL3)
			5101.3	To Build C-programs by using data structures like arrays, strings. (BTL6)
			5101.4	To differentiate recursive and non-recursive functions in different applications of C programs.(BTL2)
			5101.5	Make use of pointers, structures and files to build c programs which are useful for real time development. (BTL6)
I-I	15A056101	Engineering physics	56101.1	Explain interference, diffraction, lasers, fiber optics. (BTL2)
			56101.2	Analyse crystallography, X-ray diffraction ultrasonics (BTL4)
			56101.3	Determine subatomic world, quantum picture (BTL5)
			56101.4	Describe semiconductors, magnetic materials (BTL2)
			56101.5	Explain superconductors, nanomaterials (BTL4)
I-I	15A03101	Engineering drawing	3101.1	Draw various curves applied in engineering. (BTL3)
			3101.2	Show projections of points, lines, planes and solids graphically. (BTL1)
			3101.3	Draw the development of surfaces of

				solids. (BTL3)
			3101.4	Use computers as a drafting tool. (BTL3)
			3101.5	Draw isometric and orthographic drawings using CAD packages. (BTL6)
I-I	15A52102	English language communication skills lab	52102.1	Pronounce words correctly using speech sounds, word stress, intonation and rhythm. (BTL2)
			52102.2	Acquire proficiency in spoken English. (BTL2)
			52102.3	Apply English language skills effectively for interviews, group discussions, public speaking and debates with sheer confidence. (BTL3)
			52102.4	Develop their employability skills. (BTL3)
			52102.5	Identify techniques for writing a speech on an occasion and furthermore, give reviews on a book orally or in written form. (BTL3)
I-I	15A56102	Engineering Physics lab	56102.1	Application of interferece and diffraction(exp.no:1,2,8,10) (BTL3)
			56102.2	Determination of NA, AA, Energy gap(exp.no:3,4) (BTL5)
			56102.3	Calculations using laser (exp.no:11,12,13) (BTL3)
			56102.4	Evaluation of dispersive power (exp.no:9) (BTL5)
			56102.5	Analysing variation of magnetic field

				(exp.no:14) (BTL4)
I-I	15A05102	Computer programming lab	5102.1	To understand programs with simple data types, variables, constants and I/O statements in C. (BTL2)
			5102.2	To Solve problems by using control structures and modularity (BTL6)
			5102.3	Build programs using basic data structures include arrays, strings and structures (BTL6)
			5102.4	To make use of the user define functions, recursive and non-recursive functions in C programs. (BTL2)
			5102.5	Apply pointers and dynamic memory allocation for dealing real world problems (BTL3)
I-II	15A52201	English for professional Communication	52201.1	Participate effectively in debates on modern corporatism and listen, and speak well in English in group discussions. (BTL3)
			52201.2	Recall the alternative sources of energy by listening, summarizing and rewriting reports. (BTL1)
			52201.3	Develop report writing skills. (BTL3)
			52201.4	Interpret charts and tables. (BTL2)
			52201.5	Communicate effectively in interviews by developing required competence thereby enhancing improving job prospects. (BTL2)
I-II	15A54201	Mathematics-II	54201.1	Understand the usage of Laplace Transforms. (BTL2)
			54201.2	Evaluate the Fourier Series expansion of periodic functions. (BTL5)
			54201.3	Understand the usage of Fourier

				Transforms. (BTL2)
			54201.4	Formulate/Solve/Classify the solutions of P.D. Equations and also find the solutions of 1-Dimensional Wave equations and Heat equations. (BTL6)
			54201.5	Understand the usage of Z-Transforms. (BTL2)
I-II	15A01201	Engineering Mechanics	1201.1	Develop students to acquire knowledge of static and dynamic behavior of the bodies. (BTL3)
			1201.2	Develop students to acquire the knowledge, so that they can understand physical phenomenon with the help of various theories.(BTL3)
			1201.3	Develop students, who will be able to explain the physical phenomenon with help of diagrams.(BTL3)
			1201.4	Develop students with a broad vision with the skills of visualizing and developing their own ideas, and to convert those ideas in to engineering problems and solving those problems with the acquired knowledge of the Engineering Mechanics. (BTL3)
I-II	15A51101	Engineering chemistry	51101.1	Differentiate between hard and soft water.(BTL3)
			51101.2	Discuss BUNA-S and BUNA-N Elastromers (BTL2)
			51101.3	Understand the electrochemical sources of energy. (BTL3)
			51101.4	Discuss about solid, liquid, gaseous fuels (BTL2)
			51101.5	Understand the principles of lubricants and CNTs (BTL2)

I-II	15A01101	Environmental studies	1101.1	Understand the various natural resources (BTL2)
			1101.2	Describe about the Biodiversity and Ecosystem (BTL2)
			1101.3	Discuss about the pollution aspects (BTL3)
			1101.4	To know about the social issues related to environment and their protection acts (BTL1)
			1101.5	Describe about the population explosion and welfare programme (BTL2)
I-II	15A01202	Applied mechanics lab	1202.1	To verify the Polygon Law of Coplanar Forces for a concurrent force system (BTL5)
			1202.2	To verify the Principle of moments using the Bell Crank lever apparatus (BTL5)
			1202.3	To determine the coefficient of Static Friction between two surfaces (BTL2)
			1202.4	To understand the Single and Double gear arrangement (BTL2)
			1202.5	To establish law of machine (BTL6)
I-II	15A51102	Engineering chemistry lab	51102.1	Determine the calorific value of fuel and viscosity of the oils.(BTL3)
			51102.2	Estimate the ferrous iron and copper iodometry. (BTL2)
			51102.3	Estimate the hardness of water and copper by EDTA method. (BTL3)
			51102.4	Measure the manganese in steel and iron in cement. (BTL3)
			51102.5	Illustrate the concentration values of

				different solutions by conductometry. (BTL2)
I-II	15A99201	Engineering &IT workshop	99201.1	To provide Technical training to the students on Productivity tools like Word processors, Spreadsheets, Presentations (BTL2)
			99201.2	To make the students know about the internal parts of a computer, assembling a computer from the parts, preparing a computer for use by installing the operating system (BTL2)
			99201.3	To learn about Networking of computers and use Internet facility for Browsing and Searching. (BTL2)
II-I	15A01201	Engineering Mechanics	1201.1	Basic concepts of Engineering Mechanics including Rigid Body & Force. Understanding & application of principles of Statics. (BTL2&3)
			1201.2	Concepts of Friction & its applications (BTL2&3)
			1201.3	Understanding and application of concepts of Centroids and Moment of inertia (BTL2&3)
			1201.4	Concepts and applications of Kinematics and Kinetics of rigid bodies. (BTL2&3)
			1201.5	Analysis of Trusses & concepts of mechanical vibrations. (BTL4)
II-I	15A01302	Building Materials and Construction	1302.1	To understand the characteristics of various building materials such as stone and clay product. (BTL2)
			1302.2	To identify and apply the national

				standards in glass and plastic materials in building construction. (BTL4)
			1302.3	To identify the thermal insulation material for construction activities. (BTL4)
			1302.4	To understand the construction procedure of various building components such as stair cases, masonry and flooring. (BTL2)
			1302.5	To Identify and select the materials for finishes and internal construction activities. (BTL4)
II-I	15A01303	Strength of Materials –1	1303.1	To Understand the concepts of stress and strain at a point as well as the stress-strain relationships for homogenous, isotropic materials (BTL2)
			1303.2	To Derive the concept SFD and BMD. Apply S.F and B.M concept on cantilever beam with point load and UDl. (BTL3)
			1303.3	To Apply the concept of Pure bending, Evaluate the bending stress and section modulus rectangular and circular sections also Understanding concept of Shear stress distribution. (BTL3)
			1303.4	To Understanding concept of slope and deflection for a circular arc. (BTL2)
			1303.5	To Apply the design principles for the design of dam, chimneys, retaining walls, which are subjected to both direct and bending stresses. (BTL3)
II-I	15A013	Surveying – I	1304.1	To Understand the working principles

	04			of survey instruments and Identify data collection methods, prepare field notes and maps. (BTL2)
			1304.2	To Explain correctly the basics and methods of measuring distance, bearing and angle. (BTL2)
			1304.3	To Measure the horizontal distances, difference in elevations, draw and use contour plots. (BTL3)
			1304.4	To Assess errors and apply corrections. (BTL3)
			1304.5	To Interpret survey data and compute areas and volumes (BTL3)
II-I	15A01305	Fluid Mechanics	1305.1	To Understand the basic concepts and characteristics of static fluids, kinematic and dynamics of fluid and their behavioural properties. (BTL2)
			1305.2	To Impart factual and conceptual knowledge on different types and the characteristics of flow in pipes (BTL1)
			1305.3	To Interpret the fundamentals which will be helpful in engineering application intensive courses like Hydraulics and hydraulic machinery. (BTL3)
			1305.4	To Understand how to execute the integral forms of governing laws of fluid mechanics to predict relevant pressures, velocities and forces. (BTL2)
			1305.5	To Familiarize with various flow measuring devices, their classification and the working principles. (BTL1)
II-I	15A013	Surveying	1306.1	To Able to measure difference in elevation, length, calculate the area of

	06	Lab – I		a land and prepare the map. (BTL3,4 & 6)
			1306.2	To Apply the principle of surveying for civil Engineering Applications like Calculation of areas, drawing plans and contour maps using different measuring equipment at field level. (BTL3)
			1306.3	To Apply conventional surveying tools such as chain/tape, compass, plane table, level in the field of civil engineering applications such as structural plotting and highway profiling (BTL3)
			1306.4	To Apply the Longitudinal sectioning and cross sectioning in the field. (BTL3)
			1306.5	To Formulate the two-point problem, and three-point problem in drawing sheet. (BTL6)
II-I	15A01307	Strength of Materials Laboratory	1307.1	To understand the Behavior of materials like steel, wood, concrete etc (BTL2)
			1307.2	To understand the direct tension, compression, shear, torsion and bending. (BTL2)
			1307.3	Finding properties of materials like young's modulus, modulus of rigidity, hardness, toughness. (BTL3)
			1307.4	To Evaluate the stiffness of springs (BTL5)
			1307.5	To understand the different types of beams & their behavior in bending. (BTL2)

II-II	15A01401	Strength of Materials – II	1401.1	To Determine and illustrate principal stresses, maximum shearing stress, and the stresses acting on a structural member. (BTL3)
			1401.2	To Able to calculate the stresses induced in thin cylinders and thick cylinders and obtain safe dimensions. (BTL3)
			1401.3	To Understanding concept of Theory of pure torsion. (BTL2)
			1401.4	To Understand the failure phenomenon of columns and struts and finding the stresses developed in them. (BTL2)
			1401.5	To Able to calculate the stresses developed in a beam subjected to unsymmetrical bending and also find shear center. (BTL3)
II-II	15A01402	Surveying – II	1402.1	To Explain the reciprocal observations**.** (BTL2)
			1402.2	To Apply the knowledge of principles and purpose of Tacheometry in finding out the constants. (BTL3)
			1402.3	To Understand the need for checks and systems in the Quality Assurance process. (BTL2)
			1402.4	To Prepare to set out simple circular curves. (BTL6)
			1402.5	To Interpret the basic principles of total station, GPS and GIS in civil engineering. (BTL3)
II-II	15A01403	Structural Analysis – I	1403.1	To Apply energy theorems for analysis of indeterminate structures. (BTL3)
			1403.2	To Differentiate determinate and indeterminate structures and

				Understand static and kinematic indeterminacies with truss problems. (BTL4)
			1403.3	To Analyze the beams subjected to loads and Study effect of sinking of supports of performance. (BTL4)
			1403.4	To Analyze beams and frames by using slope deflection method. (BTL4)
			1403.5	To Analyze beams and frames by using moment distribution method. (BTL4)
II-II	15A01404	Hydraulics & Hydraulic Machinery	1404.1	Introduce the concept of flow through open channel; understand how it is different from pipe flow and their applications in real life. (BTL2)
			1404.2	Understand the variation of flow parameters for different types of flow, variation of velocity and pressure distribution in open channel. (BTL2)
			1404.3	Familiarize hydraulic machines, turbines and understand the working principles and designs of these machines and the turbines. (BTL1)
			1404.4	Familiarize pumps and understand their working principles and design the centrifugal and multi stage pumps. (BTL1)
			1404.5	Execute/ implement the conceptual knowledge learned in fluid mechanics for practical engineering related problems. (BTL3)
II-II	15A01405	Fluid Mechanics & Hydraulic	1405.1	To Determine the fluid flow principles in orifice and Venturi meter. (BTL3)
			1405.2	To Calculate Coefficient of discharge for orifice and mouth piece. (BTL3)

		Machinery Lab	1405.3	To Analyse the Calibration of contracted Rectangular Notch and /or Triangular Notch. (BTL4)
			1405.4	To Understand the Study of Hydraulic jump at various points. (BTL2)
			1405.5	To Determine the Efficiency test on Centrifugal Pump and performance test on Pelton wheel and Francis turbine. (BTL3)
II-II	15A01406	Surveying Lab – II	1406.1	Able to use Theodolite for traversing and analysis of field data. (BTL3)
			1406.2	Able to use Total Station for traversing, leveling and contouring. (BTL3)
			1406.3	Able to setting out Simple Curve in field. (BTL3)
			1406.4	Study of parts of a Transit Theodolite and its temporary adjustments. (BTL2)
			1406.5	Understand how advances in technology have affected surveying practice. (BTL2)
II-II	15A01407	Comprehensive Online Examination-I	1407.1	To Apply the knowledge of energy theorms in structural analysis concepts. (BTL3)
			1407.2	To Apply unit load method to find the deflection of truss. (BTL3)
			1407.3	To Explain the basic concepts of probability, random variables and solve real time problems using Baye's theorem. (BTL2)
			1407.4	To Predict the demand of a product by using demand forecasting methods and formulate the setting out of curve by linear and angular methods. (BTL3)

			1407.5	To Design open channels for most economical sections like rectangular, trapezoidal and circular sections (BTL6)
III-I	15A01501	Design and Drawing of RCC Structures	1501.1	To understand the Concepts of Limit State Method of design of RCC structures and Design of beams for flexure. (BTL2)
			1501.2	Limit state analysis and design of sections for shear and torsion and to understand and apply the concept of bond and failure modes. (BTL2&3)
			1501.3	Analysis and design of slabs. (BTL4&6)
			1501.4	Analysis and design of columns subjected to axial loads and bending moments. (BTL4&6)
			1501.5	Design of isolated and combined footings (BTL6)
III-I	15A01502	Estimation, Costing and Valuation	1502.1	To Understand Standard specifications for different items of building construction. (BTL2)
			1502.2	To prepare a detailed estimate for various buildings. (BTL3)
			1502.3	To Estimate different volumes of earthwork for roads and canals and to prepare bar bending schedules. (BTL3)
			1502.4	To prepare tender documents, rate analysis, schedule of rates, specifications and contracts. (BTL1)
			1502.5	To evaluate the over head charge, contigent charges and estimate for building valuation. (BTL2)

III-I	15A01503	Geotechnical Engineering – I	1503.1	To classify soil for engineering purpose and determine the index properties of soil. (BTL4)
			1503.2	To analyze the concept of Seepage, effective stress and to assess permeability of soil. (BTL4)
			1503.3	To investigate the stress behaviour of soil under various loading condition. (BTL4)
			1503.4	To assess consolidation settlement and incorporate various compaction methods. (BTL3)
			1503.5	To impart knowledge on shear strength of soil and tests to analyse soil behaviour. (BTL1)
III-I	15A01504	Engineering Geology	1504.1	Understanding the principles of engineering geology and weathering mechanism and Identification of different types of minerals and their properties. (BTL2)
			1504.2	Identify the different types rocks and their properties. (BTL4)
			1504.3	Understanding the ground water, earth quake & land slide in terms of civil engineering construction. (BTL2)
			1504.4	Evaluation of Geophysical studies and its importance (BTL4)
			1504.5	Understanding about the different type of dams,reservoirs and tunnels. (BTL2)
III-I	15A01505	Structural Analysis – II	1505.1	Analyze bending moment, normal thrust and radial shear in the arches. (BTL4)
			1505.2	Analyze beams and frames by using slope deflection and moment

				distribution methods. (BTL4)
			1505.3	Using kani's method for analysis of indeterminate structures. (BTL3)
			1505.4	Able to calculate forces in members of truss due to load by stiffness method and flexibility methods. (BTL3)
			1505.5	Analyze the formation of plastic hinges in different mechanisms (BTL4)
III-I	15A01506	Cost Effective Housing Techniques	1506.1	To understand the national housing policies and sustainable housing. (BTL2)
			1506.2	To explore the role of public housing agencies and private sectors in housing programmes. (BTL3)
			1506.3	To understand the concept of development and adoption of Low-cost Housing technology. (BTL2)
			1506.4	To Explore the alternative building materials for low-cost housing and infrastructure services in rural houses. (BTL3)
			1506.5	To adopt the suitable techniques in rural and disaster-prone areas by using locally available materials. (BTL3)
III-I	15A01507	Water Harvesting and Conservation	1507.1	Creating awareness on ground water table and movements of ground water under the rock layers (BTL6)
			1507.2	Practicing the different types of rain water harvesting methods (BTL3)
			1507.3	Analyzing the different types of water treatment methods for reuse and recycle of water (BTL4)
			1507.4	To Analyze the water conservation techniques (BTL4)

			1507.5	To Evaluate the measures for reclamation of saline soils (BTL5)
III-I	15A01508	Engineering Geology Laboratory	1508.1	To Interpret the knowledge of principles of engineering geology (BTL3)
			1508.2	To Identify the physical properties of Minerals and Rocks in the laboratory (BTL4)
			1508.3	To Justify the suitability of sites for various civil engineering structures (BTL5)
			1508.4	To Explain the knowledge for use of geological strata in the analysis and design the civil engineering structures (BTL2)
			1508.5	To Describe the suitability of water and soil conservation projects (BTL2)
III-I	15A01509	Geotechnical Engineering Laboratory	1509.1	To Identify the soil properties and classification by using Atterberg's limit, grain size analysis. (BTL4)
			1509.2	To Calculate the Field and Dry Density of Cohesion-less and Cohesive soils. (BTL3)
			1509.3	To Determine the Coefficient of Permeability of Coarse grained and Fine-grained soils& also Compressibility Characteristics of Soil. (BTL3)
			1509.4	To Evaluate the Shear Strength Parameters of Soil by Direct shear test, UCC test, Vane shear test, Triaxial shear test. (BTL5)
			1509.5	To Demonstrate various Experiments on Consolidation of Soil. (BTL3)

DEPARTMENT OF CIVIL ENGINEERING

III-I	15A99501	Audit course - Social Values & Ethics	99501.1	To Differentiate between Basic Concepts of Family and Society (BTL4)
			99501.2	To Analyse about Social Harmony and National Integration (BTL4)
			99501.3	To Understand the knowledge about Environment Issues (BTL2)
			99501.4	To Explain about Gender Sensitization, Civil/ Self Defence (BTL2)
			99501.5	To Differentiate between Physical, Psychological, Social problems also To Differentiate between Kriyas, Bandhas and Mudras (BTL4)
III-II	15A01601	Concrete Technology	1601.1	Understand the functional role of ingredients of concrete and implement this knowledge to mix design philosophy. (BTL2)
			1601.2	Impart conceptual knowledge on the properties of fresh and hardened concrete. (BTL3)
			1601.3	Explain the behaviour of concrete in fresh and hardened state by the variation of ingredients of concrete. (BTL2)
			1601.4	Inculcate the testing methodology to evaluate the properties of concrete during fresh and hardened state. (BTL2)
			1601.5	Impart knowledge on the special concrete and design mix. Execute this knowledge to design a mix according to the required properties. (BTL2)

III-II	15A01602	Design and Drawing of Steel Structures	1602.1	Learn the concepts of limit state design of steel structures and the fundamentals of structural steel fasteners & tension members (BTL1)
			1602.2	To analyse and design the compression members. (BTL4&6)
			1602.3	To design the beams and purlins(BTL6)
			1602.4	Design of Eccentric connections(BTL6)
			1602.5	To understand and design of Plate & Gantry girders (BTL2&6)
III-II	15A01603	Geotechnical Engineering – II	1603.1	To recommend an appropriate site investigation programme for any construction. (BTL3)
			1603.2	To Explain about the failure of slopes in different zones of soils. (BTL2)
			1603.3	To determine the various types of earth pressure and stability of retaining structures. (BTL3)
			1603.4	To explore the bearing capacity of soil for different types of shallow foundation with different conditions. (BTL3)
			1603.5	To examine the load carrying capacity & settlement of piles. (BTL4)
III-II	15A01604	Transportation Engineering - I	1604.1	Understanding the highway planning and development (BTL2)
			1604.2	Analyze various types of road cross sectional elements and to calculate radius and extra widening of horizontal curves and vertical curves. Analysing the various sight distance elements (BTL4)

			1604.3	Understand the traffic engineering regulations with basic parameters of traffic and to evaluate different types of traffic studies. (BTL2)
			1604.4	Explain Design Intersections and prepare traffic management plans (BTL2)
			1604.5	Explore concept of rotary and design factors of rotary and other at grade intersections (BTL3)
III-II	15A01605	Water Resources Engineering – I	1605.1	To Analyse the concepts of Engineering Hydrology and its applications. (BTL4)
			1605.2	To prepare a unit Hydrograph and to design Runoff estimation, estimation of design discharge and flood routing. (BTL6)
			1605.3	To Understand the basic types of irrigation, irrigation standards and crop water assessment. (BTL2)
			1605.4	To design an irrigation channel based on silt theories. (BTL6)
			1605.5	To understand various hydraulic structures such as diversion head works and cross regulators, canal falls and structures involved in cross drainage works (BTL2)
III-II	15A01606	Remote Sensing & GIS	1606.1	Analyse the principles and components of photogrammetry and remote sensing. (BTL4)
			1606.2	Outline skills in handling instruments, tools, techniques and modeling while using Remote Sensing Technology. (BTL4)
			1606.3	Describe the process of data

				acquisition of satellite images and their characteristics. (BTL2)
			1606.4	Derive the concepts and fundamentals of GIS. (BTL3)
			1606.5	Apply math, science, and technology in the field of water resource Engineering. (BTL3)
III-II	15A01607	Disaster Management & Mitigation	1607.1	To Summarize concept, different types of disasters and their effects on environment. (BTL5)
			1607.2	To understand the types of Environmental hazards & Disasters. (BTL2)
			1607.3	To Describe the causes of disasters and their control measures. (BTL1)
			1607.4	To Apply disaster management techniques through engineering applications. (BTL3)
			1607.5	To apply the new Emerging approaches in Disaster Management. (BTL3)
III-II	15A01608	Intellectual Property Rights	1608.1	To understand the types and Importance Of Intellectual Property Rights. (BTL2)
			1608.2	To evaluate the trade mark selection and trade mark registration process. (BTL4)
			1608.3	To understand the law of copy rights and patents. (BTL2)
			1608.4	To describe the liability and trade secrete litigations. (BTL1)
			1608.5	To Identify the new developments and International Overview On Intellectual Property. (BTL4)

III-II	15A01609	Concrete Technology Laboratory	1609.1	Check the quality of cement (BTL4)
			1609.2	Check the characteristics of fine and coarse aggregates(BTL4)
			1609.3	Interpret the behaviour and characteristics of the fresh and hardened concrete (BTL2)
			1609.4	Implement the conceptual knowledge on fresh concrete workability properties to judge the suitability of concrete (BTL3)
			1609.5	Check the strength of hardened concrete through destructive and non-destructive tests. (BTL4)
III-II	15A01610	Transportation Engineering Laboratory	1610.1	To Identify Engineering Properties of Aggregates and the Grade & Properties of Bitumen (BTL4)
			1610.2	To Predict out the Peak Hour Traffic & Peak Time for a given location on the road (BTL3)
			1610.3	To Calculate Design Speed, Maximum Speed & Minimum Speed limits of a location through spot speed (BTL3)
			1610.4	To Measure the Quality Control tests on Pavements and Pavement Materials Evaluate (BTL3)
			1610.5	To Examine various Specific Tests required for Field Application and draw necessary inferences (BTL4)
III-II	15A01611	Comprehensive Online Examination-II	1611.1	To Identify and describe different constituent of concrete. (BTL4)
			1611.2	To Design bolted and welded connections of various structures (BTL6)
			1611.3	To Understand about the importance of foundation and their necessity of

				designing. (BTL2)
			1611.4	To Analyse the concepts of Engineering Hydrology and its applications. (BTL4)
			1611.5	To Predict out surveys involved in planning and highway alignment and the causes of disasters with their control measures. (BTL3)
IV-I	15A01701	Finite Element Methods	1701.1	Demonstrate the differential equilibrium equations and their relationship. (BTL2)
			1701.2	Analyze plane stress and plane strain problems Outcomes. (BTL4)
			1701.3	Demonstrate the displacement models and load vectors. (BTL2)
			1701.4	Compute the stiffness matrix for isoperimetric elements . (BTL4)
			1701.5	Apply numerical methods to FEM. (BTL3)
IV-I	15A01702	Transportation Engineering - II	1702.1	To Interpret the importance of railway infrastructure planning and design. (BTL2)
			1702.2	To Identify the factors governing design of railway infrastructures and to Design and analyze the railway track system. (BTL2)
			1702.3	Understanding about airport engineering. (BTL2)
			1702.4	Analyzing the different aspects of the airport design. (BTL5)
			1702.5	To Analyze about the description of harbours& ports. (BTL5)
IV-I	15A017	Environmenta	1703.1	To Identify the source of water and water demand. (BTL2)

	03	l Engineering	1703.2	To Apply the water treatment concept and also to understand the various water distribution methods. (BTL3)
			1703.3	To Prepare basic process designs of water and wastewater treatment plants collect, reduce, analyze, and evaluate basic water quality data. (BTL2)
			1703.4	To Determine the sewage characteristics and design various sewage treatment plants. (BTL5)
			1703.5	To understand the concept of solid waste management and identify the impacts of air pollution and noise pollution on environment. (BTL2)
IV-I	15A01704	Water Resources Engineering – II	1704.1	To Understand various hydraulic structures such as diversion head work, canal falls and structures involved in cross drainage works. (BTL2)
			1704.2	To Design head and cross regulator structures for river training work. (BTL6)
			1704.3	To understand about flood routing concepts & Design of different types of dams. (BTL2)
			1704.4	To Design and analyse the stability of Earth and Gravity dams. (BTL6)
			1704.5	To understand the concept of spillways and Development of hydro power in India. (BTL2)
IV-I	15A01705	Design and Drawing of Irrigation Structures	1705.1	To analyse and design a Sloping glacis weir(BTL4)
			1705.2	To Design and illustrate various components in the Surplus weir. (BTL6)

			1705.3	To understand and illustrate the design aspects of Tank sluice with tower head (BTL2)
			1705.4	To Discuss various structures involved in cross drainage work for Type III Syphon aqueduct. (BTL2)
			1705.5	To Design head and cross regulator structures (BTL6)
IV-I	15A01706	Ground Improvement Techniques	1706.1	Applying grouting and Dewatering techniques. (BTL3)
			1706.2	Understanding in-situ Densification methods on granular and cohesive soils.(BTL2)
			1706.3	Understanding different methods of stabilization of soil. (BTL2)
			1706.4	Understanding the principles of reinforced earth and Utilization of Geosynthetics for ground improvement. (BTL2)
			1706.5	Identifying the problems in expansive soils.(BTL3)
IV-I	15A01707	Air Pollution and Quality Control	1707.1	Creating awareness on Air pollution and its negative effects (BTL6)
			1707.2	Analysing different type of methods in removal of harmful gases (BTL4)
			1707.3	Understanding the different type of harmful air control practices (BTL2)
			1707.4	Examining the control of gaseous pollutants by wet and dry methods (BTL4)
			1707.5	Analysis of air pollutants and its quality management (BTL4)
IV-I	15A017	Bridge	1708.1	To apply various standard specifications for road bridges.

	08	Engineering		(BTL3)
			1708.2	Able to apply the knowledge about R.C.C. bridge and steel bridge and their types also. (BTL3)
			1708.3	Design and detail of T-Beam bridges. (BTL6)
			1708.4	To understand various types of sub-structures and foundations, bearing, joints and appurtenances required for bridges. (BTL2)
			1708.5	Design and check the stability of piers and abutments. (BTL6)
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IV-I	15A01709	Earth Quake Resistant Design of Structures	1709.1	apply the basics of Earthquake Engineering (BTL3)
			1709.2	Demonstrate the dynamics of structural system under earthquake load (BTL3)
			1709.3	analyze the influence of the structural / geometrical design in building characteristics (BTL4)
			1709.4	demonstrate the cyclic loading behavior of RC steel and pre-stressed Concrete elements. (BTL3)
			1709.5	Apply codal provisions on different types of structures. (BTL3)
IV-I	15A01710	Rehabilitation and Retrofitting of Structures	1710.1	To Identify and define all the terms and concepts associated with deterioration and distress in concrete structures. (BTL2)
			1710.2	To Identify the suitable material and techniques for fire damage and corrosion of reinforcement. (BTL2)
			1710.3	To Evaluate the damage in distressed structures through Inspection and Testing. (BTL5)

			1710.4	To Understand different strengthening methods for structural retrofitting and jacketing. (BTL2)
			1710.5	To Understand various types of sensors and building instrumentation. (BTL2)
IV-I	15A01711	CAD Laboratory	1711.1	Understand the Basic modeling in STAAD pro. (BTL2)
			1711.2	Design of the structural elements using different design codes. (BTL6)
			1711.3	Analyse the various elements like beam, column, truss, frame. (BTL4)
			1711.4	Interpretation the data from STAAD. (BTL5)
			1711.5	Derive the Analysis and design Retaining walls. (BTL4)
IV-I	15A01712	Environmental Engineering Laboratory	1712.1	To Estimate various parameters like PH, Chlorides, Sulphates, Nitrates in water. (BTL5)
			1712.2	To Demonstrate the laboratory experiments on various parameters of water and waste water. (BTL2)
			1712.3	To Analyse the technical laboratory report on quality assessment of potable and waste water. (BTL4)
			1712.4	To Estimate of industrial effluents of samples in the laboratory. (BTL6)
			1712.5	To Apply the laboratory results in the basic environmental design and in the field of Engineering. (BTL3)
IV-II	15A01801	Urban Transportation Planning	1801.1	Analysing the travel demand for construction of new roads by using Origin and Destination survey. (BTL4)
			1801.2	Identify the principles of

				transportation planning. (BTL2)
			1801.3	Illustrate about the steps involved in different trip generation models. (BTL3)
			1801.4	Apply the concept of Traffic assignment and Mode Split. (BTL3)
			1801.5	Understand the concept of Economic Evaluation of Transportation plans. (BTL2)
IV-II	15A01802	Advanced Structural Engineering	1802.1	Design of roof systems with reference to Indian standards. (BTL6)
			1802.2	Design of silos. (BTL6)
			1802.3	Design of chimneys. (BTL6)
			1802.4	Design of water retaining structures. (BTL6)
			1802.5	Design of retaining walls. (BTL6)
IV-II	15A01803	Prestressed Concrete	1803.1	To Analyse the various principle of post tensioning and pre tensioning of concrete (BTL4)
			1803.2	To Predict the losses in pre tensioning and post tensioning of concrete (BTL3)
			1803.3	To Design various sections of pretensioning of concrete for flexure(BTL6)
			1803.4	To Analyse various sections to withstand shear(BTL4)
IV-II	15A01804	Environmental Impact Assessment	1804.1	Understanding about the importance of EIAM. (BTL2)
			1804.2	Analyzing the different types of EIA methodologies. (BTL4)

		and Management	1804.3	Understanding the development projects impacts on ground water and soil quality. (BTL2)
			1804.4	Understanding the development projects impacts on vegetation and wildlife. (BTL2)
			1804.5	Knowing the different types of act that are related to Environment. (BTL1)
IV-II	15A01805	Comprehensive Viva Voce	1805.1	To Prepare Oral Presentation skills by answering questions in precise and concise manner. (BTL3)
			1805.2	To Develop confidence and inter-personal skills. (BTL6)
			1805.3	To Explain the answer very clearly for all the courses (BTL2)
			1805.4	To Discuss the clear explanation about the course structure. (BTL3)
			1805.5	To Examine the Personal development skills so that to enhance knowledge. (BTL5)
IV-II	15A01806	Technical Seminar	1806.1	To Develop comprehensive report based on literature survey/Topics related to different subjects in the semester. (BTL6)
			1806.2	To Identify the applicability of modern software tools and technology. (BTL3)
			1806.3	To present the Answer for queries which is posed by the listeners. (BTL3)
			1806.4	To Asses himself for to improve presentation skills. (BTL5)
			1806.5	To Evaluate the skills which is required for the topic. (BTL5)

IV-II	15A01807	Project Work	1807.1	To Prepare abstract for given project by identifying the requirements and prospective solution. (BTL3)
			1807.2	To Develop latest information related to the project from various sources to analyse the project. (BTL6)
			1807.3	To Choose the materials for the project as per specifications and efficient test for developing the project. (BTL5)
			1807.4	To Illustrate effective team work after efficient testing, elaborate the completed task and compile the project. (BTL2)
			1807.5	To Prepare a good report of the project as per the guidelines and present to the panel of experts. (BTL3)
IV-II	15A01808	Survey Camp	1808.1	To Identify various conventional instruments involved in surveying with respect to utility and precision. (BTL2)
			1808.2	To Explain the Use and operation of Theodolite in the field. (BTL2)
			1808.3	To Apply the knowledge of Theodolite in different operations in civil engineering projects. (BTL3)
			1808.4	To Apply the knowledge and principles for the purpose of Tacheometric survey in finding out the constants. (BTL3)
			1808.5	To Outline accurate measurements, field plotting and adjustment of traverse. (BTL2)