Course Code	Course Name	Course Outcomes
14211001	Mathematics-1	CO-1. Modeling of certain physical phenomena into appropriate matrices and their transformations.
		CO- 2. Transforming line integrals, double and triple integrals into one another in solving mathematical models of some engineering applications.
		CO- 3. Students shall apply Laplace transform techniques in Transient and steady state analysis of electrical circuits, analysis of Structural engineering problems such as deflection of beams, columns etc.
		CO-4. Students are able to understand and apply Green's, Stoke's and Gauss-divergence theorems in solid mechanics, fluid mechanics, electrical engineering and various other fields.
14211002	Mathematics-2	CO-1. Students are able to understand and apply differential equations in solving Hydrodynamics, Electromagnetic fields and Fluid mechanics problems.
		CO- 2. Students are able to understand and apply Numerical Methods in solving Simultaneous equations and Transcendental equations.
		CO-3. Solving engineering problems that can be modeled as ordinary differential equations without finding general solutions.
		CO-4. Students are able to apply Fourier transform techniques to solve the Differential and Partial Differential equations that may arise in electrical circuits, analysis of Structural engineering problems such as deflection of beams, columns etc**.**
14221003	Engineering Physics	• CO-1. The different realms of physics and their applications in both scientific and technological systems are achieved through the study of physical optics, lasers and fiber optics.
		• CO-2. The important properties of crystals like the presence of long-range order and periodicity, structure determination using X-ray diffraction are focused along with ultrasonic non-destructive technique.
		• CO-3. The properties and device applications of semiconducting and magnetic materials are illustrated.

		• CO-4.The importance of super conducting materials and Nano-Materials along with their engineering applications is well elucidated
14231004	Engineering Chemistry	CO-1. Graduate will be able to apply the knowledge of chemistry to identifying and addressing the problems of boilers in industry.
		CO-2. Graduate will be able to appreciate the use of high polymers in engineering uses.
		CO-3. Graduate will demonstrate the knowledge of Fuels and lubricating oils in Engines.
		CO-4. Graduate will be able to appreciate the appropriate analytical methods in chemical analysis using instrumentation.
14241005	English	CO-1. Have improved communication in listening, speaking, reading and writing skills in general.
		CO-2. Have developed their oral communication and fluency in group discussions and interviews.
		CO-3. Have improved awareness of English in science and technology context.
		CO-4. Have achieved familiarity with a variety of technical reports.
14031006	Engineering Drawing	CO-1.Apply principles of drawing in representing dimensions of an object.
		CO-2.Construct polygons and curves.
		CO-3.Draw projections of points, lines, planes and solids in different positions.
		CO-4.Convert the orthographic views into isometric views and vice versa.
14051007	Problem Solving & Programming in C	CO-1. Able to understand the basic building blocks of C.
		CO-2. Able to use logical structure and control structures of a computer program.
		CO-3. Able to describe the use of arrays and modular programming
		CO-4. Able to illustrate the use of memory allocation and file handling functions.

14991008	Engineering Workshop	CO-1.Use marking tools, measuring tools, cutting tools (chisels, saws) used in carpentry and fitting trades to prepare basic carpentry and fitting joints.
		CO-2.Prepare Foundry jobs like single piece pattern and double piece pattern.
		CO-3. Make basic house wire connections.
		CO-4.Fabricate tin smithy jobs using snips, stakes and wooden mallet.
		(IT-Workshop)
		CO-5. Able to assemble and disassemble the PC.
		CO-6. Able to install Windows OS.
		CO-7. Able to work with MS-Office.
		CO-8. Able to Browse the Internet.
14051009	Programming in C Lab	CO-1. Able to write, compile and debug programs in C language and use different data types in a computer program.
		CO-2. Able to implement programs involving decision structures, loops, arrays and functions on different applications.
		CO-3. Able to implement the modular programming concepts, pointers, structures and unions.
		CO-4. Able to develop the concepts of file I/O operations and random access to files
14991010	Engineering Sciences Lab	CO-1. Graduate will be able to apply the knowledge of physics laboratory in measuring the standard values.
		CO-2. Graduate will correlate the theory and experimental results.
		CO-3. Graduate will be able to apply the knowledge of chemistry laboratory in identifying and addressing the problems in hardness of water.
		CO-4. Able to appreciate the appropriate analytical methods in chemical analysis using instrumentation.
		CO-1. Have improved communication in listening, speaking, reading and writing skills in general.

14241011	English Language and Communication Skills Lab	CO-2. Have developed their oral communication and fluency in group discussions and interviews.
		CO-3. Have improved awareness of English in science and technology context.
		CO-4. Have achieved familiarity with a variety of technical reports.
1402101	Basic electrical and electronics engineering	CO-1. 1) Students are able to understand the basic concept of magnetic, AC & DC mechines nd measuring instruments
		CO- 2. Students gain knowledge about the fundamentals of electrical components and electonics components , devices and circuts concept
		CO- 3. gain knowledge about properties and application of diode
		CO-4. students able to understand fundamental of circuts components, electronics devices and integrated
1402102	Probability and startics	CO1. Acquire knowledge of introductory probability and statistics.
		CO2. Develop an appreciation of the fact that lack of complete, deterministic knowledge about the state of a system does not mean lack of knowledge altogether.
		CO3. Learn how to build probabilistic models that describe imperfect state information. And learn how to update these models as additional information is obtained.
		CO4. Develop problem-solving approaches to learning and acquiring information through sampling
		CO5. Understand how redundancy of functional components of a system and the general system architecture affect system reliability.
1402103	Engineering Mechanics	CO-1. Students are able to understand to Resolution of forces and to comprehend the various forces , structral elemnts and determinethe stresses and starins
		CO- 2. Students are able to understand to knowledge of mathematics, science , and engineering
		CO-3. To know concepts of kinematics and kinetics of practice to the analysis of simple practcie problem
		CO-4. To gain knowledge about Area and volume by integration method and area , volume properties

1402104	Mechanics of materals-1	CO-1. Students are able to understand shear force and bending moment concept due to external loads
		CO-2. Graduate will known about theory of torsion developed in solids , ollow shafts and helical springs
		CO-3. Graduate will demonstrate the knowledge bending theory and deflection of beamslubricating oils in Engines.
		Co-4 To understand the concept of mechanics of structures , to understand bheviour of and determine the different stresses
1402105	Introduction to Suveying	CO-1. Students are able to understand chain surveying, and chaining methods , obstacles
		CO-2. Students are understand the compass surveying , types and angualr surveying
		CO-3. Students are able to understand elevation points for the preparing maps and contour maps
		CO-4. Students are know the volume of earth work quantities, and areas for the construction purpose
1402106	Building materials	CO-1. Gradutes are know the diiferent types of materials and its functions
		CO-2. Students are able to understand cement materials , types and its functions
		CO-3. To gain the knowledge about steel materials , functions. And light weight of concrete
		CO-4. To understand the advance materials concept of recent materials reactive powder, Geopolymer concrete
1402107	Surveying Lab-1	CO-1. students will be able to practically to draw plans and its relevent positions
		CO-2. to know the idea about determining areas and volumes for civil engineering works
		CO-3. to know the idea about different methods in plane table surveying

		CO-4. to know the disfference in elevaion by differnt methods and prepare contours
1402108	Strength of Materials Lab	CO-1 Students known aboutInterpret the hardness curve measured after heat treatment
		Co-2 Gain idea about Correlation between material structure and its creep property
		Co-3 Gain knowledge about Index XRD plot and determine the phases
		CO-4 student to understand the behavior of materials under different types of loading for different types structures
14012201	Engineering Geology	CO-1. BE ABLE TO IDENTIFY AND CHARACTERIZE INTACT ROCK/ROCK MASS PROPERTIES.
		CO- 2. TEST STUDENT KNOWLEDGE OF DESIGN AND CONSTRUCTION REQUIREMENTS FOR UNDERGROUND ROCK OPENINGS IN SPECIFIC GEOLOGIC SETTINGS.
		CO- 3.HAVE KNOWLEDGE OF THE FIELD AND LABORATORY TEST PROCEDURES AND BE ABLE TO INTERPRET TEST RESULTS NEEDED TO ESTIMATE INTACT AND ROCK MASS PROPERTIES.
		CO-4. students able to understand petrology concept
140212202	Environmental studies	CO-1 To Umderstand key concepts from economic, political, and social analysis as they pertain to the design and environmental policeies
		CO-2 To know th e environmental conceppts ecosystem and its functions
		CO-3 Students to know the biodiversity concept and types and its threats
		CO-4 Gain the knowledge about the environmental pollution , prttecton methods and environmental rules and regulations
		CO-1.Understand the concept of stress, principal stresses, strains and stress distribution on various cross sections of members due to eccentric and lateral loads,

14012203	Mechanics of materals -2	CO-2 To understand the different types of columns and its failure criteria
		CO-3. Gain the knowledge aabout the behaviour of fixed and contineous beams in different loading conditions
		CO-4.To understanding the concept of energy methods
14012204	Adavanced Surveying	CO-1. Students are able to understand smodren equipments theodolite and total station
		CO-2. Understand the measuring of horizontal anfle and vertical angle by theodolite and know the concept of tangential tacheometry
		CO-3. To know the different types of traversing methods by different equipments
		Co-4 Gain the knowledge abot the curves concept, types setting out methods of different curves
14012205	Fluid Mechanics-1	CO-1. Students are able to understand the concept of fluids aand its relative properties
		CO-2. To know the concept of fluid kinematics and its methods
		CO-3. gain knowledge abot the types of flows and its measurments , equipments construction specifications
		CO-4. To know the reynolds number and the laminor flow and turbolent flow concept
14012206	Building Construction	CO-1. Gradutes are get idea about planning, building rules and regulations
		CO-2. Gain the knowlwdge floors, roofs adnd other components of building
		CO-3.To understand the construction of different types of masonry works and brick work
		CO-4. To gain idea about the oncpet of green building fundamentals and principle s.
		CO-1. Understand the fixed beams and three moment theorem and its applications
		CO-2. Understand the importance of the slope deflection method

14012207	Structral anallysis	CO-3. To understand the concept of analogy methods kanis methods and its applications
		CO-4. Get idea about approximate analysis of indeterminate structures for contineous beam
14012208	Surveying Lab-2	CO-1 Appreciate the need for accurate and thorough note taking in field work to serve as a legal record.
		CO-2 Students Have the ability to apply knowledge of mathematics, science, and engineering to understand the measurement techniques and equipment used in land surveying.
		CO-3 To know the idea of use of modren theodolite and total station
		CO-4 Get the idea about setting out curves by linear methods and instrumental methods
14012209	Computer Aided Building Drawing Lab	CO-1 Students able to understanding the basics of building drawing
		CO-2 Get the idea about Developing plan, section and elevation of a residential building
		CO-3 Developing Plan , Section, and elevation of a two paneled door
14013101	Matrix method of structral analysis	CO-1. Ability to analyze statically determinate trusses, beams, and frames and obtain internal loading .
		CO-2 Students are able to understand solve statically indeterminate structures using matrix (stiffness) method
		CO-3 Get idea about the concept of finite elements methods in civil engineering
		CO-4 Gradutes are know the application of Finite element method for beam and bar elements
14013102	Fluid Mechanics -2	CO-1 know the concept of and behaviour of the flows in different states
		CO-2 To gain the knowledge water properties in open channels, uniform flow
		CO-3 to get the idea about non uniform flow and , surface profile of the water

		CO-4 Important of dimensional analysis methods and laws of similitude , model and prototype
14013103	Soil Mechanics	CO-1 Understand the origin of the soil and geological cycle, use AASHTO method for soil classification
		CO-2 Apply principles of phase diagram for soil properties and perform basic weight-volume calculations
		CO-3 Gain the knowledge about important of compaction, methods of compaction, and consolidation properties
		CO-4 know the about strength properties of different types of soils and its methods
14013104	Introduction to Reinforced concrete Design	CO-1 Know the concept of design methods of Reinforced structures ,IS-456 Specfications, andMaterials properties.
		CO-2 Gain the knowledge about Concepts of strain compatibility and equlibriam concept to determine the strength of RC members
		CO-3 Get the idea about design of shear, flexure, torsion and bonding RC members
		CO-4 Design the columns by Axial loading and uni axial loading bu SP-16 codes specifications
14013105	Hydraulic Machinery	On successful completion of this course, the students will be able to
		CO1. demonstrate knowledge on different types of jets & turbines and their performance & applications in power plants.
		CO2. demonstrate knowledge onoperational aspects of different pumps.
		CO3. Analyze the performance of different types of jets and turbines used in power plants.
		CO4. Analyze operational characteristics of different types of pumps.
		CO-1 Get an idea of water supply and its development, need, objectives to the public

14013106	Water Supply Engineering	CO-2 Gain the knowledge about the sources, Quality and Standards of water. An acquaintance with different treatments for protected water supply
		CO-3 • Know the Advanced water treatments in removal of harmful constituents and water management
		CO-4 Students able to understand the Different water distribution system, its working and the basics of plumbing
14013107	Fluid Mechanics and Hydraulic Machinery Lab	CO-1 Gain the knowlefhe about measurig the rate of flow in pipes by using venturimeter and orificemeter
		CO-2 Measure the discharge using rectangular and triangular notches
		CO-3 Students are able to understand the head loss due to friction
		CO-4 Calculate the head loss due to bend and elbow of the pipe
14013108	Soil meachanics Lab-1	CO-1 To gain idea about Classify soil by physical observation of the soils
		CO-2 Classify soil based on estimated index and engineering characteristics of soils
		CO-3 Gain the idea about compaction methods in field practically
		CO-4 know the Relative density of for cohesionless soils
14013109	Engineering Geology Lab	CO-1 Sudents will have able to categorize minerals and rocks their origins and engineering properties
		CO-2 Student will have to understand basic properties of megascopic and microscopic observations of minerals and rock properties
		CO-3 Sudents will have to identify materials (rocks) using various construction projects
		CO-4 Students should able to understand the soil classification systems , relationship between rocks engineering properties
		On successful completion of the course, student will be able to

14253201	Managerial Economics and Financial analysis	CO1. Expected to achieve the overall course objective to understand and enhancing the knowledge in managerial economics
		CO2. Enhancing the knowledge of managerial concepts and obtaining optimal solutions
		CO3. To get an idea of analysis of firm's financial position
		CO4. With the techniques of financial analysis and ration enhancing the knowledge regarding accounting system and obtaining accuracy in financial matters.
14013202	Highway Engineering	CO-1 Gain the knowledge about different engineering surveys and take up different highway alignment projects
		CO-2 To know the knowledge planning and geometrical design of roads
		CO-3 know the various methods Design highway pavement geometrics
		CO-4 To know the idea about highway material properties their specification and maintananice of roads.
14013203	Design of Steel structures	CO-1 get the idea about IS specification related to steel structures.
		CO-2 To know the design methodology of the steel structures of various members tension member and compression members
		CO-3 Students able to understand the concept of Riveted, welded joints in steel structures
		CO-4 get the idea about design of beams , and connections deflection , and know the concept of Gantry girders
14013204	Waste Water and Solid waste management	CO-1 students able to understand basics of sewage, types of sewers and sewer materials
		CO-2 Get idea about physical, chemical and biological properties BOD equation and factors affecting BOD rate of reaction and various treatment process
		CO-3 to know the biological treatment of sewage design and construction of activated sludge process

		CO-4 To know the solid wastages, types , methods of collection, and methods of diposal and its control
14013205	Hydrology	CO-1 Have a thorough understanding of the theories and principles governing the hydrologic processes and its components
		CO2 Develop Intensity-Duration-Frequency and Depth-Area Duration curves to design hydraulic structures
		CO-03 Design storms and carry out frequency analysis, Be able to determine storage capacity and life of reservoirs
		CO-4 Develop unit hydrograph and synthetic hydrograph, Be able to estimate flood magnitude and carry out flood routing, • Determine aquifer parameters and yield of wells, Be able to model hydrologic processes
14013206	Concrete Technology	CO-1 Students able to Know the basics of cement, its composition, different properties
		CO-2 Get familiarize with aggregates used in concrete and the properties of fresh concrete
		CO-3 Students able to Know about elasticity, shrinkage creep and durability of concrete
		CO-4 get idea about Design the mix of concrete proportions by ACI and IS methods
14013207	Prestressed Concrete	CO-1 To know the basics of cement, its composition, different properties
		CO-2 Get idea about prestressed concrete and methods
		CO-3 gain knowledge about methods of prestressing and post tensioning
		CO-4 Students will understand the concept of design of slabs by prestressed
		CO-1 Learn the fundamental concepts of construction management principles in the field of construction engineering and management

14013208	Construction planning and management	CO-2 know the concept on network analysis CPM and PERT methods and network rules and regulations
		CO-3 Get idea about the construction and equipment management like scrapers, loader, concrete mixture etc.
		CO-4 learn the inspection of projects and stages of inspection and quality control. Know the ethical audit procedures.
14013209	Environmental Engineering Lab	CO-1 Students able to understanding the PH and turbidity and water quality
		CO-2 To know the Alkalinity , Estimate the total solids , organic solids
		CO-3 know the nitrogen content and estimate the BOD and COD
		CO-4 Determine the optimum chlorine demand and optimum coagulant dose
14013210	Concrete Technology Lab	CO-1 students know the consistance of cement , intial setting time and final setting time of cement
		CO-2 gain idea about soundness of cement , method of testing of compressive strength of cement
		CO-3 know the various methods of workbility by slump test and compaction factor test
		CO-4 know the bulking of fine aggregates , and know the coarse aggregate properties
1401401	Advanced Reinforced concrete design	CO-1 students able to understand the concept of slabs and staircase
		CO-2 Gain the idea about design of columns, IS code specifications
		CO-3 To know the design methodology of footings, clear cover and design of combined footings
		CO-4 known the concept of design of cantilever retaining walls and water storage tanks
		CO-1 students able to understand the traffic engineering administration , functions , importance, Traffic management system

14014102	Traffic Engineering	CO-2 To know the Traffic surveys volume, speed, and density of traffic
		CO-3 to Know the traffic safety, Road accident causes and prventation of accidents
		CO-4 To know the Traffic regulation sings, signals , and specifications. Road marking types and functions
14014103	Irrigation and Hydraulic Structures	CO-1 students will be able to estimate irrigation water requirments
		CO-2 Get knowledge about classification of canals design by different methods
		CO-3 Diversion head works , weirs , barrage , causes of failure of head works and its preventations.
		CO-4 students will able to understand uses of dams , classification, site for dams estimate capsity of dam ,and failures of dams
14014104	Quantity Surveying and Valuation	CO-1 students will able to know the specification of of different item of works and other works
		CO-2 know the rate analysis of different items earthwork , brick masonry, plastering and painting
		CO-3 Estimate the building and prepare bar bending schedyles.
		CO-4 Get idea about contract and type of contact terms and conditions and valution of property.
14014105	Foundation Engineering	CO-1 Carry out soil investigation for any civil engineering construction
		CO-2 Analyze earth retaining structures for any kind of soil medium
		CO-3 Estimate bearing capacity using IS code methods, design proper foundations for any kind of shallow foundation system
		CO-4 Estimate pile and pile group capacity for any kind of soil including group efficiency and negative friction, Design of well foundation, design of slopes for any type of soil conditions.

14014106	Introduction to Optimization Techniques.	CO-1 Students knows formulate optimization problems
		CO-2 Students will understand and apply the concept of optimality criteria for various type of optimization problems
		CO-4 solve various constrained and unconstrained problems in single variable as well as multivariable
		CO-4 Apply the methods of optimization in real life situation
14014107	Introduction to digital image processing	CO-1. Examine various types of images, intensity transformations and spatial filtering.
		CO-2. Develop Fourier transforms for image processing in frequency domain.
		CO-3. Evaluate the methodologies for image segmentation, restoration, topology, etc.
		CO-4. Analyze Image data compression techniques.
14014108	Introduction to Database management	CO-1 Students know the terminology, features, classifications, and characteristics embodied in database systems
		CO-2 Analyze an information storage problem and derive an information model expressed in the form of an entity relation diagram and other optional analysis forms, such as a data dictionary
		CO-3 Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS
		CO-4 Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database
14254109	Professional Ethcs	CO1. Students identify and analyze statutory, regulatory, constitutional, and organizational laws that affect the information technology professional.
		CO2. Students locate and apply case law and common law to current legal dilemmas in the technology field.
		CO3. Students apply diverse viewpoints to ethical dilemmas in the information technology field and recommend appropriate actions.

		CO4. Students distinguish enforceable contracts from non-enforceable contracts.
1414110	Highway Engineering Materials Lab	CO-1 Students will know the Aggregate crushing, impact properties for the construction purpose
		CO-2 Get idea about Shape and Size tests for aggregates
		CO-3 Tests carried out various methods on Bituminous materials
14014201	Design Drawing Irrigation Structures	CO-1 Students will know the importance of , location, components of irrigation structures.
		CO-2 Get idea about Exposure to the design and drawing of various irrigation structures.
		CO-3 students will have Ability to meet the requirements of irrigation design engineers in large and small
14014202	Remote Sensing & GIS	CO-1 Perceive the basics of remote sensing
		CO-2 To know the characteristics of the instruments used for remote sensing
		CO-3 Analyze the need and standard techniques used for image processing , Perceive the basics of GIS
		CO-4 Study the areas of application using Remote Sensing and GIS
14014203	Basic soil dynamics and machine foundations	CO-1 Students knows the scope and siginificane of soil dynamics.
		CO-2 To get the idea about basic dynamic properties of soils.
		CO-3 To know the theory of vibaration and waves , waves propagation.
		CO-4 Design the simple machine foundation.
14014204	Bridge Engineering	CO-1 To develop an understanding of and appreciation for basic concepts in proportioning and design of bridges in terms of aesthetics, geographical location and functionality
		CO-2 to know the importance of Site investigation for in bridge design
		CO-3 students will have ability to understand the design of Piers, Abubutments

14014205	pairs and Rehabilitation of Structur	CO-1 to know the perform of the materials and service for strength , thermal properties.
		CO-2 To know the Maintaninace, repairand rehabilititaion and materials for the repairs.
		CO-3 to know the strengthening and demolition aspect cirteria
14014206	Rilways ,Docks and Harbour Engineering	CO-1 To understand Explain various aspects related to construction and maintenance of Railway, Harbour and Tunnel structures
		CO-2 To understand the various procedures for construction activities related to Railway, Harbour and Tunnel structures
		CO-3 To gain the knowledge about historical development of ports, docks
		CO-4 To know the Dredging methods , and its maintainance
14014207	Hydropower Engineering	CO-1 students will have understand the sources of energy , turbines and its parts
		CO-2 To know the classification of hydropower plants
		CO-3 To known the importance of water , penstocks working.
		CO-4 Design feature of turbines , Caviation , Governing model testing. To know the power house planing
14014208	Disaster Management and mitigation	CO-1 To know the various types of hazards and risk
		CO-2 To know the disaster management , Preparing disaster preparedness plan
		CO-3 Various technology using in Disasater , emeregency management system (EMS)