



ACHARYA INSTITUTE OF TECHNOLOGY

Affiliated to Visvesvaraya Technological University, Belagavi,
Approved by AICTE, New Delhi, Recognized by Govt. of Karnataka and
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DEPARTMENT OF CIVIL ENGINEERING

2022 SCHEME

Course Name	Course Code	CO. No.	Course Outcomes
STRENGTH OF MATERIALS	BCV301	CO1	Solve the simple stresses, strains and compound stresses
		CO2	Illustrate the Bending moments, shear force for various types of beams and loadings
		CO3	Compute the bending stress, shear stress and torsional stress in beams and shafts with different cross sections
		CO4	Compute the deflection in beams and determine the stability of the columns.
		CO5	Determine the behavior and strength of structural elements under the action of compound stresses and stresses in thin and thick cylinders
ENGINEERING SURVEY	BCV302	CO1	Describe the importance of surveying, principles of remote sensing, geographic information system, GPS & there applications.
		CO2	Establish reduced level, plot profile, compute linear and angular measurements, Demonstrate use of theodolite, dumpy level and Total Station.
		CO3	Compute data for curve setting and earthwork estimation.
		CO4	Integrate the concepts of Basic surveying with respect to the experiments.
		CO5	Conduct the experiments using given instruments.
		CO6	Tabulate, Validate the readings and infer the results graphically/mathematically
		CO7	Interpret the concepts and results both orally and written.
ENGINEERING GEOLOGY	BCV303	CO1	Describe earths Internal Structure, isoseismal lines, Factors causing natural disasters
		CO2	Apply the Knowledge of minerals and rock in selection of building materials
		CO3	Infer details of soil features/properties and its effect on structures
		CO4	Categorize earths structural features and its effects on civil engineering structures
		CO5	Apply geophysical exploration methods for ground water development and applications
		CO6	Interpret the minerals and rocks based on the physical properties
		CO7	Illustrate subsurface data with the available surface date for different civil engineering structures.



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WATER SUPPLY AND WASTEWATER ENGINEERING	BCV304	CO1	Compute the water demand for the population forecasted data of a community .
		CO2	Solve the problems on various water treatment units to meet the desired water quality.
		CO3	Predict the strength of BOD for the different characteristics of waste water.
		CO4	Interpret the various municipal waste water treatment unit operations and processes
		CO5	Apply the attached growth process concept for the treatment of municipal waste water.
COMPUTER AIDED BUILDING PLANNING AND DRAWING	BCV305	CO1	Understand the basic concepts of auto cadd to draw the building components
		CO2	Draw the components of building elements as per the design requirements using Auto-CAD software
		CO3	
		CO4	
FIRE SAFETY IN BUILDINGS	BCV306D	CO1	Understand the hazards that pose a danger or threat from fire and its effects on construction material
		CO2	Discuss the system of lift and elevators in accordance with fire safety
		CO3	Describe the constant demand and variable demand in flow of pipe networks in water distribution system
		CO4	Apply the concept of HVAC system in building maintenance and management
		CO5	Discuss the results of the condition survey and health evaluation of buildings
SOCIAL CONNECT AND RESPONSIBILITY	BSCK307	CO1	Participate in plantation and adaption
		CO2	Explain heritage walk and various craft corners
		CO3	Show the needs and involve them in community problem solving
		CO4	Explain water conservation and its implementation
		CO5	Explain the cities culinary practices - Objectives, problem solving report and Outcomes
DATA ANALYTICS WITH EXCEL - IBM	BCV358A	CO1	Explain the use of Spreadsheet and identify the principles of data analysis
		CO2	Calculate the data using functions in spread sheet
ANALYSIS OF STRUCTURES	BCV401	CO1	Identify the different forms of structural systems and analyse the trusses.
		CO2	Evaluate the slope and deflections in beams, frames and trusses by using moment area method and energy principle.
		CO3	Analyse and determine the stress resultants in arches and cables.
		CO4	Analyse the indeterminate structures and construct BMD AND SFD using slope deflection methods.



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		CO5	Analyse the indeterminate structures and construct BMD AND SFD using Moment Distribution Method
FLUID MECHANICS AND HYDRAULICS	BCV402	CO1	Apply the knowledge of fundamental properties of fluids in fluid pressure measurement, total and center of pressure on vertical and inclined plane surfaces.
		CO2	Apply the knowledge of Kinematics, Hydro-Dynamics and Bernoulli's principle in problem solving.
		CO3	Calculate the discharge over notches and losses in series and parallel pipes.
		CO4	Determine the most economical channel sections and flows in open channels.
		CO5	Determine the impact of jet on vanes and working proportions of turbines and pump.
		CO6	Writeup and Conduct / Demonstrate the experiments with the given specification.
		CO7	Interpret the concepts orally and Tabulate, Validate the results graphically and mathematically.
TRANSPORTATION ENGINEERING	BCV402	CO1	Understand the principles of transportation engineering, capability of planning and proposing a new alignment or realignment of existing roads and also design the road geometrics.
		CO2	Evaluate the engineering properties of the materials and design the pavement as per standard practices.
		CO3	Conduct traffic studies and analyse traffic data for practical applications.
		CO4	Describe the Components parts of Railway Track and calculate the materials required for laying a track.
		CO5	Describe the elements of airport engineering and design the runway pavements.
		CO6	Write and conduct the experiments on aggregates, Bitumen and Soil.
		CO7	Tabulate, Validate the readings and infer the results graphically/mathematically and interpret the results both orally and written.
BUILDING MATERIALS TESTING LAB	BCVL404	CO1	State different engineering and mechanical properties depending on standards
		CO2	Explain, classify and describe the type and its requirements according to construction industries
		CO3	Compute the properties of different materials and evaluate the results based on standards
CONCRETING TECHNIQUES & PRACTICES	BCV405C	CO1	Evaluate the properties of basic materials used in concrete by conducting test on cement, aggregates and mineral admixtures.
		CO2	Understand to Select and proportionate different chemical admixture materials used in a concrete mix.
		CO3	Design a concrete mix as per requirement of



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			construction project by using IS10262 code book.
		CO4	Understand Production of concrete mixing and transportation of concrete handling of concrete at construction, ready-mix concrete.
		CO5	Understand Special types of concrete used in construction, do's and don'ts in concrete construction.
GIS WITH QUANTUM GIS	BCV456B	CO1	Create Vector Maps for analyxsis
		CO2	Evaluate Raste Base maps based on their properties.
		CO3	Tabulate, Validate the GIS data results graphically/mathematically.
		CO4	Interpret the results and the avilable output maps
BIOLOGY FOR ENGINEERS	BBOK407	CO1	To describe cell, its properties, functions and requirements of cells in physiological conditions
		CO2	To articulate the biomolecular requirements of cells in physiological conditions and emphasizing their application
		CO3	Compare the working human organs to known equipments/machineries
		CO4	Relate various technologies on the principles of biomechanics
		CO5	Evaluate the design of bioengineering used in the solution of contemporary problems.
UNIVERSAL HUMAN VALUES	BUHK408	CO1	To understand their responsibilities as in life, handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
		CO2	To understand importance of critical ability.
		CO3	To uderstand importance of commitment towards human values,
		CO4	To understand importance of human relationship and human society.
		CO5	To understand importance of Decission making
BIOLOGY FOR ENGINEERS	BBOK407	CO1	To describe cell, its properties, functions and requirements of cells in physiological conditions
		CO2	To articulate the biomolecular requirements of cells in physiological conditions and emphasizing their application



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2021 SCHEME

Course Name	Course Code	CO. No.	Course Outcomes
Transform Calculus, Fourier Series & Numerical Techniques (Common To All)	21MAT31	CO1	Understand The Concepts Of Laplace Transforms, Fourier Series, Fourier Transforms, Z-Transforms, Numerical Techniques And Calculus Of Variations
		CO2	Demonstrate Various Physical Phenomena Using The Concepts Of Laplace Transforms, Fourier Series, Fourier Transforms, Z-Transforms, Numerical Techniques And Calculus Of Variations
		CO3	Apply The Knowledge Of Laplace Transforms, Fourier Series, Fourier Transforms, Z-Transforms, Numerical Techniques And Calculus Of Variations In Modeling Various Physical And Engineering Phenomena.
		CO4	Relate The Concepts Of Laplace Transforms, Fourier Series, Fourier Transforms, Z-Transforms, Numerical Techniques And Calculus Of Variations To Their Respective Branches.
Geodetic Engineering	21CV32	CO1	Describe types of surveying through time and measure distance using different instruments.
		CO2	Establish reduced levels, plot profile, contours, compute linear and angular measurements. Demonstrate use of theodolite and total station
		CO3	Compute data for curve setting and earthwork estimation.
		CO4	Describe principles of Remote Sensing, Digital Image processing & Interpretation of satellite images, Geographic Information system, GPS and their applications
Strength of materials	21CV33	CO1	Solve the simple stresses, strains and compound stresses
		CO2	Illustrate the Bending moments, shear force for various types of beams and loadings
		CO3	Compute the bending stress, shear stress and torsional stress in beams and shafts with different cross sections
		CO4	Compute the deflection in beams and determine the stability of the columns.
		CO5	Determine the behavior and strength of structural elements under the action of compound stresses and stresses in thin and thick cylinders
Earth Resources and Engineering Engineering	21CV34	CO1	Describe earths Internal Structure, isoseismal lines, Factors causing natural disasters
		CO2	Apply the Knowledge of minerals and rock in selection of building materials
		CO3	Infer details of soil features/properties and its effect on structures



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		CO4	Categorize earths structural features and its effects on civil engineering structures
		CO5	Apply geophysical exploration methods for ground water development and applications
Computer Aided Building Planning and Drawing	21CVL35	CO1	Understand the basic concepts of auto cadd to draw the building components
		CO2	Draw the components of building elements as per the design requirements using Auto-CAD software
		CO3	
		CO4	
Fire Safety in Buildings	21CV385	CO1	Understand the hazards that pose a danger or threat from fire and its effects on construction material
		CO2	Discuss the system of lift and elevators in accordance with fire safety
		CO3	Describe the constant demand and variable demand in flow of pipe networks in water distribution system
		CO4	Apply the concept of HVAC system in building maintenance and management
		CO5	Discuss the results of the condition survey and health evaluation of buildings
Societal Connect and Responsibility	21SCR36	CO1	Participate in plantation and adaption
		CO2	Explain heritage walk and various craftcorners
		CO3	Show the needs and involve them in community problem solving
		CO4	Explain water conservation and its implementation
		CO5	Explain the cities culinary practices - Objectives, problem solving report and Outcomes
Fluid Mechanics and Hydraulics	21CV42	CO1	Understand and apply the knowledge of fundamental properties of fluids, fluid pressure and its measurement, Total and Centre of pressure on vertical and inclined plane surfaces
		CO2	Understand and apply the knowledge of Kinematics, Hydro-Dynamics and Bernoulli's principle in practical problem solving
		CO3	Analyze the discharge over notches and pipes
		CO4	Understand and determine the most economical channel sections, turbines and pumps along with its working proportions
		CO5	Writeup and Conduct / Demonstrate / Simulate the experiments with the given specification
		CO6	Interprete the concepts orally and Tabulate, Validate the results graphically and mathematically
Public Health Engineering	21CV43	CO1	To understand the importance of water and waste water considering the collection, conveyance and disposal
		CO2	To analyse the treatment required to water and waste water considering its various physical, chemical and



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			biological parameters
		CO3	To estimate the water demand and sewage discharge of a community and to design various water and waste water treatment units
		CO4	Writeup and Conduct / Demonstrate / Simulate the experiments with the given standard procedure
		CO5	Interprete the concepts orally and Tabulate, Validate the results graphically and mathematically
Analysis of Structures	21CV44	CO1	Identify the different forms of structural systems and analyse the trusses.
		CO2	Evaluate the slope and deflections in beams, frames and trusses by using moment area method and energy principle.
		CO3	Analyse and determine the stress resultants in arches and cables.
		CO4	Analyse the indeterminate structures and construct BMD AND SFD using slope deflection methods.
		CO5	Analyse the indeterminate structures and construct BMD AND SFD using Moment Distribution Method
Engineering Geology Lab	21CVL46	CO1	Conduct and write the geological interpretations, material strength with the given data and specifications
		CO2	Evaluate features based on their properties
		CO3	Tabulate, Validate the material properties and geological data with results graphically/mathematically
		CO4	Interpret the results with respect to minerals, rocks and geological subsurface both orally and written
Green Buildings	21CV485	CO1	Understand Different Alternative Materials for Construction
		CO2	Understand and Apply the techniques used in Environment Friendly Buildings
		CO3	Understand the Impacts of Building Materials on Global Warming
		CO4	Understand the Necessity of Green Rating Systems
		CO5	Understand Alternative Source of Energy and Effective Use of Water
Universal Human Values	21UH49	CO1	To understand their responsibilities as in life, handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
		CO2	To understand importance of critical ability.
		CO3	To understand importance of commitment towards human values
		CO4	To understand importance of human relationship and human society
		CO5	To understand importance of Decision making
Hydrology and	21CV51	CO1	Estimate mean rainfall, optimum number of rain gauges



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Water Resources Engineering			and losses of precipitation using different methods.
		CO2	Derive Unit Hydrographs of different durations using concept of catchment.
		CO3	Estimation of crop water requirement along with discuss irrigation benefits, ill effects and systems of irrigation.
		CO4	Design of canals using Kennedys and Lacey method along with discuss the storage capacity of reservoir with storage zones.
		CO5	Discuss flood management, drought management and water harvesting in different sources.
Transportation Engineering	21CV52	CO1	Understand the principles of transportation engineering, capability of planning and proposing a new alignment or realignment of existing roads
		CO2	Design the road geometrics and structural components of pavements.
		CO3	Evaluate the engineering properties of the materials and suggest the suitability of same for pavement construction
		CO4	Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway drainage and financing concepts
		CO5	Describe the elements of traffic engineering, railways and airport engineering
		CO6	Write and conduct the experiments on aggregates, Bitumen and Soil
		CO7	Tabulate, Validate the readings and infer the results graphically/mathematically and interpret the results both orally and written
Design of RC Structural Elements	21CV53	CO1	Identify, formulate and solve engineering problems of RC elements subjected to different kinds of loading.
		CO2	Follow a procedural knowledge in designing various structural RC elements.
		CO3	Impart the culture of following the codes for strength, serviceability and durability as an ethics.
		CO4	Provide knowledge in analysis and design of RC elements for the success in Competitive examinations
		CO5	
Geotechnical Engineering lab	21CVL55	CO1	Students are able to understand Physical and index properties of the soil
		CO2	Determine OMC and MDD, plan and assess field compaction program
		CO3	Determine Shear strength and consolidation parameters to assess strength and deformation characteristics
		CO4	Demonstration of In-situ shear strength characteristics
		CO5	
Research	21RMI56	CO1	Explain the concepts of engineering research and Ethics



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Methodology & Intellectual Property Rights			associated with it .
		CO2	Illustrate the procedure of Literature Review, technical reading and citations.
		CO3	Describe the fundamentals of Intellectual Property, patent laws and drafting procedure.
		CO4	Explain the copyright laws, related rights and concepts of trademarks.
		CO5	Describe the principles of Industrial designs, design rights and Geographical Indications concepts.
Environmental Studies	21CIV57	CO1	Gain knowledge of Ecology, Environment, Environmental policies and regulations, Clean Energy sources, Natural resource management and sustainability.
		CO2	Understand the factors causing pollution to Water, Soil, Noise and Air and their Global Environmental Concerns.
Quality Control and Quality Assurance	21CV584	CO1	Understand concept of quality, steps involved in quality management, Total quality management, evaluation of quality management process, ISO standards.
		CO2	Understand statistical quality control, sampling, testing and acceptance criteria for concrete as per IS 456-2000 code provision
		CO3	Understand quality control and quality assurance process to be taken at construction sites
		CO4	Understand quality testing at site along with nondestructive tests
Construction Management and Entrepreneurship	21CV61	CO1	Understand Management, construction project formulation, construction planning and scheduling
		CO2	Understand concept of resource management to decide productivity and cost of resource
		CO3	Understand TQM, safety at construction works and ethics of civil engineer
		CO4	Apply time value of money with in alternatives based on time and value of work
		CO5	Understand success in being entrepreneur, business planning process and opportunities
Concrete Technology	21CV62	CO1	Assess various properties of cement, cementitious materials, aggregate as per codal provision and specifications
		CO2	Determine the fresh properties of a concrete
		CO3	Design the concrete mix for the given materials as per IS:10262-2019 provisions
		CO4	Determine the hardened properties of a concrete
		CO5	Describe the durability aspects of concrete
		CO6	Writeup and Conduct / Demonstrate the experiments with the given specification.



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		CO7	Interprete the concepts orally and Tabulate, Validate the results graphically and mathematically.
Design of Steel structure	21CV63	CO1	Possess knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel.
		CO2	Understand the Concept of Bolted and Welded connections.
		CO3	Understand the Concept of Design of compression members, built-up columns and columns splices.
		CO4	Understand the Concept of Design of tension members, simple slab base and gusseted base.
		CO5	Understand the Concept of Design of laterally supported and un-supported steel beams.
Railways, Harbour, Tunneling and Airports	21CV643	CO1	Acquires capability of choosing alignment and also design geometric aspects of railway system, runway and taxiway
		CO2	Suggest and estimate the material quantity required for laying a railway track and also will be able to determine the hauling capacity of a locomotive
		CO3	Develop layout plan of airport, harbour, dock and will be able relate the gained knowledge to identify required type of visual and/or navigational aids for the same
		CO4	Apply the knowledge gained to conduct surveying, understand the tunnelling activities.
Alternative Building Materials	21CV66	CO1	Solve the problems of Environmental issues concerned to building materials and cost-effective building technologies
		CO2	Select appropriate type of masonry unit and mortar for civil engineering constructions; also, they are able to Design Structural Masonry Elements under Axial Compression
		CO3	Analyze different alternative building materials which will be suitable for specific climate and in an environmentally sustainable manner. Also capable of suggesting suitable agro and industrial wastes as a building material
		CO4	Recommend various types of alternative building materials and technologies and design a energy efficient building by considering local climatic condition and building material.
		CO5	Recommend various types of Equipment for Production of Alternate Materials .
Computer Aided Detailing of Structure	21CV6	CO1	Students are able to prepare detailed working drawing



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Mini Project	21CVMP67	CO1	Demonstrate an ability to identify and formulate a hypothesis for a given problem and test through appropriate experiments.
		CO2	Apply relevant modern tools to solve the identified technical problem.
		CO3	Analyze and evaluate the experimental results and propose suitable modifications to improve performance.
		CO4	Work effectively as a member or a leader of a team.
		CO5	Communicate technical content effectively through written reports and oral presentations.
Occupational Health and Safety	21CV653	CO1	Identify hazards in the workplace that pose a danger or threat to safety or health.
		CO2	Outline the analysis of a potential safety and health hazard in the occupational Health and Safety Regulations as well as supported legislation.
		CO3	Discuss the role of health and safety in the workplace pertaining to the responsibilities of workers, managers, supervisors.
		CO4	Analysis of various methods to take the decisions required to maintain protection of the environment, workplace as well as personal health and safety.
Conservation of Natural Resources	21CV654	CO1	Apprehend various components of land as a natural resource and land use planning.
		CO2	Know availability and demand for water resources as applied to India.
		CO3	Analyse the components of air as resource and its pollution.
		CO4	Discuss biodiversity & its role in ecosystem functioning.
		CO5	Critically appreciate the environmental concerns of today.
Remote Sensing and GIS	21CV651	CO1	To understand Science of Remote sensing and parameters related to RS.
		CO2	To understand Techniques of Photogrammetry and its principals
		CO3	To Apply knowledge of GIS to perform data overlay operations
		CO4	To Apply RS and GIS for solving problems in field of Water Resource planning and management
		CO5	To Apply RS and GIS for solving problems in field of Infrastructure development



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2018 SCHEME COURSE OUTCOMES

Course Name	Course Code	CO. No.	Course Outcomes
TRANFORM CALCULUS, FOURIER SERIES & NUMERICAL TECHNIQUES	18MAT31	CO1	Have The Knowledge Of Laplace Transforms, Fourier Series, Fourier Transforms, Z-Transforms, Calculus Of Variations And Numerical Methods.
		CO2	Solve Engineering Problems Using Laplace Transforms, Fourier Series, Fourier Transforms, Numerical Methods And Calculus Of Variation.
		CO3	Communicate And Reflect On Applications Of Mathematics As Tool.
STRENGTH OF MATERIALS	18CV32	CO1	Solve the simple stresses, strains and compound stresses
		CO2	Illustrate the Bending moments, shear force for various types of beams and loadings
		CO3	Compute the bending stress, shear stress and torsional stress in beams and shafts with different cross sections
		CO4	Compute the deflection in beams and determine the stability of the columns.
		CO5	Determine the behavior and strength of structural elements under the action of compound stresses and stresses in thin and thick cylinders
FLUID MECHANICS	18CV33	CO1	Describe and apply the knowledge of fundamental properties of fluids, fluid pressure and its measurement.
		CO2	Apply the knowledge of Hydrostatic laws, Kinematics in practical problem solving
		CO3	Analyze the various concepts of Hydro-Dynamics and its applications.
		CO4	Apply the knowledge of concepts of Orifice, mouthpiece, hydraulic co-efficient and discharge measuring devices through open channels.
		CO5	Analyze pipe networks considering flow and its losses.
BUILDING MATERIALS AND CONSTRUCTI ONS	18CV34	CO1	Select suitable materials for buildings and adopt suitable construction techniques.
		CO2	Decide suitable type of foundation based on soil parameters
		CO3	Supervise the construction of different building elements based on suitability
		CO4	Exhibit the knowledge of building finishes and form work requirements
		CO5	
BASIC SURVEYING	18CV35	CO1	Describe principles of surveying and maps. Able to measure linear measurements
		CO2	Will be able to conduct compass surveying and traversing
		CO3	To carry out levelling and compute elevations and



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			profile
		CO4	Carry out plane table surveying and develop maps
		CO5	Compute areas and volumes for infrastructure projects. Able to plot contours for construction
ENGINEERING GEOLOGY	18CV36	CO1	Describe earths Internal Structure, isoseismal lines, Factors causing natural disasters
		CO2	Apply the Knowledge of minerals and rock in selection of building materials
		CO3	Infer details of soil features/properties and its effect on structures
		CO4	Categorize earths structural features and its effects on civil engineering structures
		CO5	Apply geophysical exploration methods for ground water development and applications
COMPUTER AIDED BUILDING PLANNING AND DRAWING	18CVL37	CO1	Understand the basic concepts of auto cadd to draw the building components
		CO2	Draw the components of building elements as per the design requirements using Auto-CAD software
		CO3	
		CO4	
BUILDING MATERIALS TESTING LAB	18CVL38	CO1	State different engineering and mechanical properties depending on standards
		CO2	Explain, classify and describe the type and its requirements according to construction industries
		CO3	Compute the properties of different materials and evaluate the results based on standards
		CO4	
ANALYSIS OF DETERMINATE STRUCTURES	18CV42	CO1	Identify different forms of structural systems.
		CO2	Construct ILD and analyse the beams and trusses subjected to moving loads
		CO3	Understand the energy principles and energy theorems and its applications to determine the deflections of trusses and beams.
		CO4	Determine the stress resultants in arches and cables.
		CO5	
APPLIED HYDRAULICS	18CV43	CO1	Express the Types of Dimensional analysis, Model Studies, Buoyancy and flotation.
		CO2	Design of most economical channel sections and describe the parameters of specific energy curve.
		CO3	Derive expressions for hydraulic jump, gradually varied flow in line with curves and profile slopes
		CO4	Analyze general layout of hydroelectric power plant, components, velocity triangles and working proportions of pelton turbine
		CO5	Analyze components, velocity triangles, working of kaplan turbine and centrifugal pump.



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CONCRETE TECHNOLOGY	18CV44	CO1	Recognise material characterisation of ingredients of concrete and it's influence on properties of concrete
		CO2	Understand proportion ingredients of concrete to arrive at most desirable mechanical properties of concrete
		CO3	Ascertain and measure engineering properties of concrete in fresh and hardened state which meet the requirement of real time structures
		CO4	Compute the ingredients of concrete to arrive concrete mix using professional code
		CO5	Understand special concretes and it's properties
ADVANCED SURVEYING	18CV45	CO1	Understand theodolite to solve horizontal and vertical distance measurements
		CO2	Apply geometric principles to arrive at solutions to survey problems
		CO3	Design proper types of curves for deviating type of alignments
		CO4	Analyse spatial data using appropriate computational and analytical techniques
		CO5	Use the concepts of advanced data capturing methods necessary for engineering practice
WATER SUPPLY AND TREATMENT ENGINEERING	18CV46	CO1	Estimate average and peak water demand for a community
		CO2	Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community.
		CO3	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
		CO4	Design a comprehensive water treatment and distribution system to purify and distribute water to the required quality standards.
ENGINEERING GEOLOGY LABORATORY	18CVL47	CO1	The students able to identify the minerals, rocks and utilize them effectively in civil engineering practices.
		CO2	The students will interpret and understand the geological conditions of the area for implementation of civil engineering projects.
		CO3	The students will interpret subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geophysical methods.
		CO4	The students will be able to identify the different structures in the field.
FLUID MECHANICS AND HYDRAULIC MACHINES	18CVL48	CO1	Integrate the concepts of Fluid Mechanics and hydraulics with respect to the experiment.
		CO2	Conduct / Demonstrate / Simulate the experiments with the given specification.
		CO3	Tabulate, Validate the readings and infer the results



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LABORATORY			graphically/mathematically.
		CO4	Interpret the concepts and results both orally and written.
CONSTRUCTION MANAGEMENT AND ENTREPRENEURSHIP	18CV51	CO1	Understand management, construction project formulation, construction planning and scheduling
		CO2	Apply concept of resource management to decide productivity and cost of resource
		CO3	Understand TQM, safety at construction works and ethics of civil engineer
		CO4	Analyse time value of money with in alternatives based on time and value of work
		CO5	Understand building enterprise, financing opportunities to start enterprise, business planning process
ANALYSIS OF INDETERMINATE STRUCTURES	18CV52	CO1	Determine the moment in indeterminate beams and frames having variable moment of inertia and subsidence using slope deflection method
		CO2	Determine the moment in indeterminate beams and frames of no sway and sway using moment distribution method.
		CO3	Construct the bending moment diagram for beams and frames by Kani's method.
		CO4	Construct the bending moment diagram for beams and frames using flexibility method
		CO5	Analyze the beams and indeterminate frames by system stiffness method.
DESIGN OF RC STRUCTURAL ELEMENTS	18CV53	CO1	Understand the design philosophy and principles.
		CO2	Solve engineering problems of RC elements subjected to flexure, shear and torsion
		CO3	Designs of RC structural elements such as slabs, columns and footings.
		CO4	
BASIC GEOTECHNICAL ENGINEERING	18CV54	CO1	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
		CO2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
		CO3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
		CO4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
		CO5	Capable of estimating load carrying capacity of single and group of piles
MUNICIPAL	18CV55	CO1	Select the appropriate sewer appurtenances and



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WASTE WATER ENGINEERING			materials in sewer network.
		CO2	Design the sewers network and understand the self purification process in flowing water.
		CO3	Design the various physic- chemical treatment units
		CO4	Design the various biological treatment units
		CO5	Design various AOPs and low cost treatment units
HIGHWAY ENGINEERING	18CV56	CO1	Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of required data.
		CO2	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction.
		CO3	Design road geometrics, structural components of pavement and drainage.
		CO4	Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financing concepts.
SURVEYING PRACTICE	18CVL57	CO1	State the basic principles of engineering surveying and for linear and angular measurements.
		CO2	Explain effectively field procedures required for a professional surveyor.
		CO3	Compute results based on techniques, skills and conventional surveying instruments necessary for Engineering practice.
		CO4	
		CO5	
CONCRETE AND HIGHWAY MATERIALS LAB	18CVL58	CO1	Determine the quality and suitability of cement
		CO2	Design appropriate concrete mix Using Professional codes
		CO3	Determine strength and quality of concrete
		CO4	Able to interpret the experimental results of concrete and highway materials based on laboratory tests
		CO5	Test the soil for its suitability as sub grade soil for pavements.
DESIGN OF STEEL STRUCTURE ELEMENTS	18CV61	CO1	Possess knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel.
		CO2	Understand the Concept of Bolted and Welded connections.
		CO3	Understand the Concept of Design of compression members, built-up columns and columns splices.
		CO4	Understand the Concept of Design of tension members, simple slab base and gusseted base.
		CO5	Understand the Concept of Design of laterally supported and un-supported steel beams.
APPLIED	18CV62	CO1	Ability to plan and execute geotechnical site



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GEOTECHNICAL ENGINEERING			investigation program for different civil engineering projects
		CO2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
		CO3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
		CO4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
		CO5	Capable of estimating load carrying capacity of single and group of piles
HYDROLOGY AND IRRIGATION ENGINEERING	18CV63	CO1	Analyze the process of hydrological cycle, measurement of precipitation and estimation of mean rainfall and optimum number of rain gauges.
		CO2	Analyze the various types of losses and its control and measurement of AET, PET and infiltration.
		CO3	Derive Unit Hydrographs of different durations using concept of catchment.
		CO4	Explain the irrigation benefits, ill effects, systems of irrigation and estimation of crop water requirement.
		CO5	Design of canals using Kennedys and Lacey method, Storage capacity of reservoir along with storage zones.
SOLID WASTE MANAGEMENT	18CV642	CO1	Analyse existing solid waste management system and to identify their drawbacks.
		CO2	Evaluate different elements of solid waste management system
		CO3	Suggest suitable scientific methods for solid waste management elements.
		CO4	Design suitable processing system and evaluate disposal sites
GROUND IMPROVEMENT TECHNIQUES	18CV644	CO1	Give solutions to solve various problems associated with soil formations having less strength.
		CO2	Use effectively the various methods of ground improvement techniques depending upon the requirements.
		CO3	Utilize properly the locally available materials and techniques for ground improvement so that economy in the design of foundations of various civil engineering structures
		CO4	
SOFTWARE APPLICATION LAB	18CV65	CO1	Analyse structural members using structural software
		CO2	Prepare plan schedule and monitor projects using MSP
		CO3	Adopt excel software to analyse civil related design problem



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		CO4	
ENVIRONMENTAL ENGINEERING LAB	18CV67	CO1	Acquire capability to conduct experiments and estimate the concentration of different parameters.
		CO2	Compare the result with standards and discuss based on the purpose of analysis.
		CO3	Determine type of treatment, degree of treatment for water and waste water.
		CO4	Identify the parameter to be analyzed for the student project work in environmental stream.
QUANTITY SURVEYING AND CONTRACT MANAGEMENT	18CV71	CO1	Preparing quantities and work out the cost for various civil engineering works
		CO2	Prepare detail and abstract estimate for various road works, structural works and water supply and sanitary works
		CO3	Prepare the specifications and analyse the rate for various items of work
		CO4	Assess contract and tender documents for various construction works
		CO5	Prepare valuation report of building
DESIGN OF RCC AND STEEL STRUCTURES	18CV72	CO1	Design RC structural elements as per IS codal provisions
		CO2	Design steel structural elements as per IS codal provisions
		CO3	
		CO4	
MASONRY STRUCTURES	18CV735	CO1	Describe the material for masonry construction, load combinations and analyze the stresses in masonry
		CO2	Design masonry under compression, Axial load ,Eccentric, lateral and transverse load for Various requirements and conditions.
		CO3	Solve the problems on behavior of shear wall and reinforced masonry.
		CO4	
DESIGN OF HYDRAULIC STRUCTURES	18CV744	CO1	Apply the knowledge of various aspects, design principles in designing elementary and practical profiles of gravity dam.
		CO2	Describe causes, failures of earthen dam and determination of phreatic line with quantity of seepage.
		CO3	Discuss and detailing of various types of spillways, diversion head works, and apron.
		CO4	Design of aqueduct and explain various types of cross drainage works.
		CO5	Explain canal regulation works, function, types and its necessity.
ENVIRONMENTAL	18CV753	CO1	Understand the concept of Corporate Environmental Management Systems and Objectives complying with



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PROTECTION AND MANAGEMENT			the International Environmental Management System Standards considering National Environmental Policies
		CO2	Analyse the concept of pollution concentration, environmental performance, stewardship, responsibility for environmental protection, programmes and audits with pollution prevention and waste minimization options.
		CO3	Application of environmental management system for different types wastes generating at various industries.
		CO4	
COMPUTER AIDED DETAILING OF STRUCTURES	18CVL76	CO1	Understand the problem statement and Design the manual drawing
		CO2	Analyzing the drawing effectively by applying the IS code
		CO3	Design the Drawing by using Cadd tool
		CO4	Interpret both the drawing written and cadd.
GEOTECHNICAL ENGINEERING LABORATORY	18CVL77	CO1	Write and conduct the experiments on Soil as per IS Codal procedures.
		CO2	Tabulate, Validate the readings and infer the results graphically/mathematically and interpret the results both orally and written.
		CO3	
		CO4	
DESIGN OF PRE-STRESSED CONCRETE	18CV81	CO1	Understand the requirement of PSC members for present scenario.
		CO2	Analyse the stresses encountered in PSC element during transfer and at working
		CO3	Understand the effectiveness of the design of PSC after studying losses
		CO4	Capable of analyzing the PSC element and finding its efficiency.
		CO5	Design PSC beam for different requirements.
PAVEMENT DESIGN	18CV825	CO1	Understand about need, scope and fundamentals involved in design of pavement.
		CO2	Design the flexible pavement by different methods.
		CO3	Analyze stresses in CC pavements and design the rigid pavements, joints.
		CO4	Evaluate flexible and rigid pavement failures, maintenance and evaluation of both flexible and rigid pavements.
REHABILITATION & RETROFITTING	18CV824	CO1	Understand the causes of structural deterioration
		CO2	Analyze the type and extent of damage assessment of structure through various tests
		CO3	Apply serviceability and durability methods to prevent corrosion in concrete
		CO4	Apply maintenance and retrofitting techniques on



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			concrete members
		CO5	Understand suitable material and suggest an appropriate method for repair and rehabilitation
PROJECT WORK PHASE 2	18CVP83	CO1	Demonstrate an ability to identify and formulate a hypothesis for a given problem and test through appropriate experiments.
		CO2	Apply relevant modern tools to solve the identified technical problem.
		CO3	Analyze and evaluate the experimental results and propose suitable modifications to improve performance.
		CO4	Work effectively as a member or a leader of a team.
		CO5	Communicate technical content effectively through written reports and oral presentations.
TECHNICAL SEMINAR	18CVS84	CO1	Ability of student to select topic in recent advances and developments of Civil Engineering field.
		CO2	Clear understanding of topic and ability of student to prepare presentation with thorough knowledge.
		CO3	Discuss the background/ advantages and disadvantages of seminar topic selected/Change compared with conventional methods of approach related with topic selected