S.P.B. PATEL
ENGINEERING COLLEGE
SAFFRONY INSTITUTE OF TECHNOLOGY CAMPUS

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CYCLE 1
NAAC Accreditation 2023

Civil Engineering

Course Outcome

Submitted to

NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

BACHELOR OF COMPUTER Engg.(BE)	
SEMESTER I	
3110003	**PROGRAMMING FOR PROBLEM SOLVING**
	Course Outcomes
CO1	Formulate algorithm/flowchart for given arithmetic and logical problem
CO2	Translate algorithm/flowchart into C program using correct syntax and and execute it
CO3	Write programs using conditional, branching, iteration, and recursion
CO4	Decompose a problem into function
CO5	Develop an application using the concepts of array, pointer,structure, and file management to solve engineering and/or scientific problems
CO6	
3110007	**ENVIRONMENTAL SCIENCE**
	Course Outcomes
CO1	Identify the types of pollution in society along with their sources
CO2	Realize the global environmental issues
CO3	Conceptualize the principles of Green Buildings and Smart cities
CO4	Implement the concept of recycle and reuse in all fields of engineering
CO5	
CO6	
3110016	**BASIC ELECTRONICS**
	Course Outcomes
CO1	Analyze the general – and special-Purpose diode circuits
CO2	Design biasing circuits for BJT
CO3	Analyze BJT Circuits in small-signal domain
CO4	Analyze basic FET Circuits
CO5	Verify the functionalities of basic digital gates and logic families
CO6	Construct and test circuit using basic electronic devices in a group
3110006	**BASIC MECHANICAL ENGINEERING**
	Course Outcomes
CO1	Discuss the various sources of energy and basic terminology of Mechanical engineering
CO2	Make calculations for commonly used working fluids i.e. ideal gases and steam
CO3	Analyze various heat engine cycles and understand construction and working of IC engines
CO4	Discuss working and applications of steam boilers and various energy conversion systems
CO5	Discuss various power transmission elements and properties of various engineering materials with their applications
CO6	
3110014	**Mathematics-1**
	Course Outcomes

CO1	To apply differential and integral calculus to improper integrals and to determine applications of definite integral. Apart from some other applications they will have a basic understanding of indeterminate forms,Beta and Gamma functions.
CO2	To apply the various tests of convergence to sequence, series and the tool of power series and fourier series for learning advanced
CO3	To compute directional derivative, maximum or minimum rate of change and optimum value of functions of several variables.
CO4	To compute the areas and volumes using multiple integral techniques.
CO5	To perform matrix computation in a comprehensive manner.
CO6	
BACHELOR OF COMPUTER Engg.(BE)	
SEMESTER II	
3110013	**ENGINEERING GRAPHICS & DESIGN**
	Course Outcomes
CO1	Know and understand the conventions and the methods of engineering drawing
CO2	Interpret engineering drawings using fundamental technical mathematics
CO3	Construct basic and intermediate geometry and comprehend the theory of projection
CO4	Improve their visualization skills so that they can apply these skills in developing new products
CO5	Improve their technical communication skill in the form of communicative drawings
CO6	Use computer software for engineering drawing
3110015	**Mathematics-2**
	Course Outcomes
CO1	To apply mathematical tools needed in evaluating vector calculus and their usage like Work, Circulation and Flux.
CO2	To apply the laplace transform as tools which are used to solve differential equations and fourier integral representation.
CO3	To apply effective mathematical tools for the solutions of first order ordinary differential equations
CO4	To apply effective mathematical methods for the solutions of higher order ordinary differential equations.
CO5	To use series solution methods and special functions like Bessels' functions.
CO6	
3110005	**BASIC ELECTRICAL ENGINEERING**
	Course Outcomes
CO1	Apply fundamental electrical laws and circuit theorems to electrical circuits.
CO2	Analyze single phase and three phase AC circuits.
CO3	Describe operating principle and applications of static and rotating electrical machines.
CO4	Comprehend electrical installations, their protection and personnel safety.
CO5	
CO6	
3110012	**WORKSHOP/MANUFACTURING PRACTICES**

	Course Outcomes
CO1	Understand various manufacturing processes in machine shop and perform basic operations of welding, fitting, smithy and carpentry work a) perform basic operations of welding, fitting, smithy and carpentry work b) Explain various manufacturing processes in machine shop
CO2	Discuss application of plumbing fitting, masonry items and about plastic molding and glass cutting for various engineering
CO3	Measure different electrical quantities and trouble shoot electrical and electronics appliances
CO4	Conduct experiments with various kits such as Raspberry and Arduino for embedded system development
CO5	Use basic commands of computer operating systems
CO6	
3110018	**PHYSICS**
	Course Outcomes
CO1	The student will gain knowledge of basic theoretical and mathematical concept of electronic materials.
CO2	The student will demonstrate understanding of basic principles, properties and applications associated with semiconducting materials.
CO3	The student will demonstrate understanding of basic theory and properties associated with optoelectronic materials.
CO4	The student will gain knowledge of the different measurements techniques to characterize various semiconducting, electrical and
CO5	The student will demonstrate understanding of basic theory, properties and applications of Superconductivity.
CO6	
3110002	**ENGLISH**
	Course Outcomes
CO1	Use various forms of vocabulary in varied situations in oral and written communication.
CO2	Understand the phonetics and the transcription pattern to learn correct pronunciation.
CO3	Comprehend the dynamics of various rules of grammar and check its validation while they speak and write language
CO4	Use grammar effectively to make themselves competent Listener, Speaker, Reader and Writer by exposing to various set of situations.
CO5	Write various formal and informal documents of day to day life and professional set up.
CO6	Demonstrate the qualities of writing in diverse situation by using the nuances such as conciseness, clarity, accuracy, organization, and coherence.
Average	

BACHELOR OF Civil Engg.(BE)								
SEMESTER III								
Course Code:	**Course Name**	**Sample**						
	Course Outcomes (CO)	CO1:Define and classify various data structures, storage structures and common operations on them.						
		CO2: Create various linear data structures with their representation and perform different operations on them						
		CO3: Create various nonlinear data structures with their representation and perform different operations on them.						
		CO4:Apply various searching sorting techniques on data set.						
		CO5:Solve the given a problem using an appropriate data structure to achieve optimal performance and compare its performance with other possible data structures						
	Credits	5(60)						
Course Code:	**Course Name**	**Mechanics of Solids**						
3130608	Course Outcomes (CO)	CO1: Apply fundamental principles of mechanics, equilibrium and statics to practical problems of engineering.						
		CO2: Determine centroid and moment of inertia of a different geometrical shape and its use in engineering problem.						
		CO3: Determine different types of stresses and strains developed in the member subjected to axial, bending, shear, torsion & thermal loads.						
		CO4: Determine principal stresses and strains for two dimensional system using analytical and graphical methods.						
		CO5: Differentiate behaviour and properties of different engineering materials.						
		CO6: Apply the basics of simple machines and their working mechanism						

	Credits	6(72)					
Course Code:	**Course Name**	**Building Construction Technology**					
3130607	Course Outcomes (CO)	CO1: Develop in- depth understanding about construction materials, building components, its construction process etc., and apply the knowledge to execute normal sized building construction project.					
		CO2: Recognize the associated entities involved in building construction process.					
		CO3: Identify the factors to be considered in planning and construction of buildings.					
		CO4: Understand the practices and techniques for Temporary/Special construction Works.					
		CO5: Able to apply learning to further research in sustainable civil engineering materials, construction technology and construction management field.					
	Credits	5(60)					
Course Code:	**Course Name**	**Building Town Planning**					
3130609	Course Outcomes (CO)	CO1: Comprehend local building bye-laws and provisions of National Building Code in respect of building and town planning resulting in functionally efficient, economically viable and legally acceptable buildings.					
		CO2: Discuss and apply various aspects of principles of building planning and town planning					
		C03: Understand and implement various aspects of Principles of Architectural composition					
		CO4: Explain the principles of planning and design considerations to construct earthquake resistant building					
		CO5: Understand, interpret and prepare working drawings, foundation plans, perspective drawing and other executable drawings and prepare the drawing using software					
	Credits	4(48)					

Course Code:	Course Name	**Geotechnical Engineering**					
3160606	**Course Outcomes (CO)**	CO1: Classify the soil and will be able to understand its behaviour and will be able to compute/estimate index parameters.					
		CO2: Interpret soil behaviour through learning soil compaction, consolidation, and analyise various theories and calculate parameters needed in design.					
		CO3: Compute earth pressure, stress distributions and FOS for slopes using various graphical and analytical tools for various engineering projects/site.					
		CO4: Differentiate, compare, formulate, and evaluate soil parameters through performing various tests as per site conditions or project needs ethically and professionally.					
		CO5: Suggest suitable type of foundation as per soil type, estimate bearing capacity and demonstrate its socio-economic feasibility.					
	Credits	5(60)					
Course Code:	Course Name	**Effective Technical Communication**					
3130004	**Course Outcomes (CO)**	CO1:Define and discuss dynamics of Verbal and Non Verbal aspects of Communication					
		CO2:Write various formal documents of technical and professional communication					
		CO3:Communicate in diverse formal situations taking place in organizations					
		CO4:Illustrate and examine the knowledge of ethical aspects of engineering					
		CO5:Demonstrate and explain social and professional etiquettes					
		CO6:Plan self-development and practice self-assessment					
	Credits	3(36)					
SEMESTER IV							

Course Code:	**Course Name**	**Structural Analysis-I**					
3140603	Course Outcomes (CO)	CO1: Apply principles of statics to determine reactions, internal actions in statically determinate framed structures including arches & cables.					
		CO2: Compute strain energy stored member subjected to axial & flexural forces.					
		CO3: Determine displacement in a statically determinate beams by different methods.					
		CO4: Perform stability checks to various structures such as chimey, retaining wall, dam subjected to gravity and lateral loading.					
		CO5: Differentiate the buckling behaviour of columns & struts with different end conditions.					
		CO6: Determine response of structure using professional software.					
	Credits	5(60)					
Course Code:	**Course Name**	**Fluid Mechanics & Hydraulics**					
3140611	Course Outcomes (CO)	CO1: Analyze forces on floating bodies and understand fluids in relative equilibrium.					
		CO2: Calibrate and demonstrate fluid flow measuring devices like venturimeter, orificemeter, notches, orifice, mouthpieces.					
		CO3: Analyze fluid flow through pipes in series, parallel and pipe networks under laminar and turbulent flow conditions.					
		CO4: Analyze open channel flow and design optimal sections; calculate forces on sluice gates considering specific energy and momentum principle.					
	Credits	5(60)					
Course Code:	**Course Name**	**Civil Engineering - Societal & Global Impact**					

3140609	Course Outcomes (CO)	CO1: Outline the role of Civil engineering in evolution and revolution of mankind and globally present status of development in India.					
		CO2: Estimate the level of resource utilization for present and future infrastructural projects using various tools/methods.					
		CO3: Infer the necessity of different conventional as well as futuristic infrastructural projects.					
		CO4: Incorporate the goal of sustainable development to minimize the potential impacts on the global environment.					
		CO5: Associate various measures for enhancing the build environment, thereby improving quality of life of the occupants.					
		CO6: Evaluate the potential of Civil Engineering for employment creation and its contribution to the GDP.					
	Credits	2(24)					
Course Code:	**Course Name**	**Complex Variables and Partial Differential Equations**					
3140610	Course Outcomes (CO)	CO1:convert complex number in a polar form, plot the roots of a complex number in complex plane, find harmonic conjugate of analytic functions and apply conformal mapping in geometrical transformation					
		CO2:evaluate complex integration by using various result, test convergence of complex sequence and series and expand some analytic function in Taylor's series					
		CO3:find Laurent's series and pole of order, and apply Cauchy Residue theorem in evaluating some real integrals					
		CO4:form and solve first order linear and nonlinear partial differential equations					
		CO5:apply the various methods to solve higher order partial differential equations, modeling and solve some engineering problems related to Heat flows, Wave equation and Laplace equation					

	Credits	5(42)					
Course Code:	**Course Name**	**Surveying**					
3140601	Course Outcomes (CO)	CO1: Conduct Plane table, Theodolite, Trigonometric levelling, Tachometric, Geodetic survey at identified site.					
		CO2: Set out simple and transition curve at given location					
		CO3: Compute area and volume using standard rule and equipments such as Plannimeter					
		CO4: Apply principles of theory of error for correction of measurements					
		CO5: Conduct the survey by modern tools such as Digital Level, Total station, GPS					
	Credits	5(60)					
SEMESTER V							
Course Code:	**Course Name**	**Concrete Technology**					
3150610	Course Outcomes (CO)	CO1: Identify the important ingredients of concrete and its role in influencing the behaviour of concrete under different environment conditions					
		CO2: Infer the results of the various experiments related to different ingredients of concrete, fresh concrete & hardened concrete					
		CO3: Apply the concepts of Mix design to produce the concrete of adequate strength and durability					
		CO4: Choose the correct type of concrete and concreting technology required for particular exposure and site condition					
		CO5: Describe the underlying principle and interpretation of different types of the non-destructive & semi destructive testing methods					
	Credits	4(48)					
Course Code:	**Course Name**	**Design of Structures**					

3150612	Course Outcomes (CO)	CO1: Describe different properties of RC and Structural steel, loads & its combinations, method of analysis used in design of structural elements.					
		CO2: Explain different design philosophy evolved time to time and its applicability in designing structural elements.					
		CO3: Apply Indian standard codal provisions of Limit state methods for RC and Steel structural components.					
		CO4: Apply design principles of Limit state methods in RC and steel structural components.					
		CO5: Appraise capacity of RC and Steel structural elements in different design methods and designing section with appropriate method.					
	Credits	5(60)					
Course Code:	**Course Name**	**Soil Mechanics**					
3150615	Course Outcomes (CO)	CO1: Classify the soil, understand its behavior and will be able to compute/estimate index parameters.					
		CO2: Interpret soil behavior due to compaction, consolidation, and analyze various theories and calculate parameters needed in design.					
		CO3: Compute earth pressure, stress distributions and FOS for slopes using various graphical and analytical tools for various engineering projects/site.					
		CO4: Differentiate, compare, formulate and evaluate soil parameters through performing various tests as per site conditions or project needs ethically and professionally.					
		CO5: Suggest suitable type of foundation as per soil type, estimate bearing capacity, Settlements and demonstrate its socio-economic feasibility.					
	Credits	4(48)					
Course Code:	**Course Name**	**Transportation Engineering**					

3150611	Course Outcomes (CO)	CO1: Illustrate and demonstrate parameters of highway planning, geometric and pavement design.					
		CO2: Analyze pavement distresses, failures and suggest prevention measures					
		CO3: Describe basics of traffic flow parameters, parking, marking, signal, and signs.					
		CO4: Solve problems of railway track geometrics and to understand various railway track materials, their properties and use.					
		CO5: Identify various component parts of dock, harbour and airports and apply ship and aircraft characteristics in planning of harbour and airports					
		CO6: Design of pavement for the given for traffic					
	Credits	4(48)					
Course Code:	**Course Name**	**Remote sensing and GIS**					
3150615	Course Outcomes (CO)	CO1: Observe, Identify and define simple/ complex problems of day to day lives present in Industry/ Society where GIS and Remote Sensing applications can be useful.					
		CO2: Apply knowledge of basic image interpretation and data image processing					
		CO3: Integrate the existing data through various observations from various angles and layer creation.					
		CO4: Apply problem-solving methodologies to generate, evaluate and justify innovative solutions by designing and conducting/ analyzing and interpreting the data.					
		CO5: Demonstrate the ability to give solutions with an ability which can help communicate effectively for giving betterinterpretation and solutions.					
	Credits	3(36)					
SEMESTER VI							

Course Code:	Course Name	Water Resourses Engineering and Hydrology					
3160610	Course Outcomes (CO)	CO1: Computation of mean precipitation from a catchment , infiltration rate and Infiltration Capacity					
		CO2: Able to calculate runoff from a catchment and Compute peak flood flow					
		CO3:Able to compute reservoir capacity using mass curve and dependable flow using flow duration curve for the requirement of irrigation, power generation etc.					
		CO4: Develop basic idea about reservoir sedimentation, its control and Computing the capacity of well					
		CO5: Estimation of design flood for the design of hydraulic structure and Measures of water conservation to battle drought					
		CO6: Understanding the concepts of Water resources planning and its environmental aspects.					
	Credits	5(60)					
Course Code:	**Course Name**	**Environmental Engineering**					
3160611	Course Outcomes (CO)	CO1: Determine the quantity and quality of water required for public water supply					
		CO2: Interpret the effect of wastewater characteristics on human health and environment					
		CO3: Design different units of water and sewage treatment plant					
		CO4: Classify solid waste and interpret the components of solid waste management system					
		CO5: Analyze the effects of air and noise pollution on human and environment and develop its remedial measures.					
	Credits	4(48)					

Course Code:	**Course Name**	**Disaster Management**					
3160622	Course Outcomes (CO)	CO1: Explain types, trends, causes consequences and control of disaster					
		CO2: Recall disaster management cycle and frame work					
		CO3: Summarize disaster management agencies and their roles in india.					
		CO4: Relate applications of sciences and technology for disaster management and mitigation.					
	Credits	3(36)					
Course Code:	**Course Name**	**Urban Transportation Planning**					
3160608	Course Outcomes (CO)	CO1: Explain basics of urban, town, transportation planning and existing system.					
		CO2: Collect the data and analyze for travel demand forecasting for horizon year by four stage modeling.					
		CO3: Classified types and Suggest mass transportation system in urban area withperformance measurement.					
		CO4: Development of trip generation and trip distribution models for study area					
		CO5: Describe goods/freight movement in urban area and identify the factors affecting.					
	Credits	4(48)					
Course Code:	**Course Name**	**Construction Equipment and Automation**					
3160617	Course Outcomes (CO)	CO1: Derive feasibility of specific equipment in different project condition					
		CO2: Selection of Automation techniques in construction industry					
		CO3: Select suitable Drone technology for surveying and project management					
		CO4: Analyze benefits of robotics versus conventional construction equipment					

		CO5: Classify application of Virtual Reality, Augmented Reality, BIM in construction industry					
		CO6: Classify application of Virtual Reality, Augmented Reality, BIM in construction industry					
	Credits	4(48)					
SEMESTER VII							
Course Code:	**Course Name**	**Environmental Impact Assessment**					
3170625	Course Outcomes (CO)	CO1: Explain the importance of EIA as an integral part of planning process					
		CO2: Examine different environmental attributes and selecting the environmental parameters affecting project					
		CO3: Apply various methods to Predict the Environmental impacts of project after deciding various environmental attributes					
		CO4: Create the EIA report for getting Environmental clearance					
	Credits	4(48)					
Course Code:	**Course Name**	**Infrastructure for Smart Cities**					
3170628	Course Outcomes (CO)	CO1: Understand the necessity of infrastructural development for smart cities.					
		CO2: Identify components of infrastructure and Prepare infrastructure plan for smart city.					
		CO3: Understand smart transport system for smart cities and its application					
		CO4: Study of water resources systems for smart city and its application.					
		CO5: Understand National and Global policies to implement for smart city development.					
	Credits	3(36)					
Course Code:	**Course Name**	**Irrigation Engineering**					

3170609	Course Outcomes (CO)	CO1: Assess consumptive Irrigation requirement based on values of Duty and Delta of different crops and plan an irrigation system.					
		CO2: Design lined and unlined canals.					
		CO3: Plan diversion head works and design it based on piping and uplift theories.					
		CO4: Plan various irrigation canal structures in the canal network as per the site situation and requirement.					
		CO5: Analyze gravity and earth dams and identify type of spillway and energy dissipation work.					
		CO6: Select suitable drainage system to reclaim water logged soil.					
	Credits	4(48)					
Course Code:	**Course Name**	**Engineering Economics, Estimation & Costing**					
3170615	Course Outcomes (CO)	CO1: Apply the basics of economics and cost analysis to engineering and take economically sound decision making.					
		CO2: Prepare rate analysis, specifications, tenders and contract of different civil work.					
		CO3: Prepare approximate and detailed estimate of a civil engineering work.					
		CO4: Utilise software for working out quantities of items of civil works.					
		CO5: Solve examples on valuation of properties/ buildings.					
	Credits	4(48)					
Course Code:	**Course Name**	**Construction Engineering Management**					
3170614	Course Outcomes (CO)	CO1: Outline components and phases of construction project					
		CO2: Infer types of project plans, Work break down structure, Planning techniques, CPM and PERT techniques project scheduling & management.					

		CO3: Illustrate periodic progress reports, Updating of plans, Cost Optimization,					
		CO4: Derive evaluation criteria and attributes for Construction Projects					
	Credits	3(36)					
Course Code:	**Course Name**	**Railway and Airport Engineering**					
3190619	Course Outcomes (CO)	CO1: Carry out geometric design of railway track					
		CO2: Recognize about various components in diverging, merging and crossings of railway tracks, stations, yards, signaling, interlocking and control systems					
		CO3: To understand the fundamentals of planning and design of Airport structures.					
		CO4: To design of runway and taxiways for Airport					
		CO5: To comprehend the use of Air Traffic Control and Visual Aids in the air traffic operation.					
	Credits	4(48)					
SEMESTER VIII							
Course Code:	**Course Name**	**Internship/Major Project**					
	Course Outcomes (CO)	CO1: Will develop professional skills and ethics based on industrial problems and effectively plan to execute the work within definite time frame and present report.					
		CO2: Design efficient technical solutions to industrial problems					
		CO3: Will find solutions related to project and finance management.					
	Credits	12(144)					

