VAAGDEVI COLLEGE OF ENGINEERING

UGC-Autonomous

Department of Civil Engineering

VISION OF THE INSTITUTION

Striving Continuously for Global Recognition through Academic Excellence in Higher Education for the Betterment of Society.

MISSION OF THE INSTITUTION

M1 **:** To Produce Technically Competent and Socially Responsible Engineers with Ethical Values Through Innovative Teaching Learning Process.

M2 **:** To Promote Research and Entrepreneurship Culture Among Faculty and Students.

VISION OF DEPARTMENT

To empower the graduates with high technical competencies to meet proficient and societal challenges in the field of Civil Engineering and Technology.

MISSION OF THE DEPARTMENT

M1 **:** To impart pioneering teaching and learning practice to the Civil Engineering graduates and educate them in the emerging technologies in Civil Engineering

M2 **:** To promote quality education, research and consultancy services in area of Civil Engineering to fulfill the needs of industries and society.

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PROGRAMME EDUCATIONAL OBJECTIVES (PEO'S) for B.Tech Civil Engineering

The Graduates of the programme will be able to:

PEO 1 : Design and contribute to the development of Civil infrastructure project and grow as a successful engineer.

PEO 2 : Update their professional skills with focus on research and industry interaction.

PEO 3 : Work in multicultural and multidisciplinary groups in accordance with technological transform for the escalation of Civil Engineering projects.

PEO 4 : Professionally competent in their chosen career with ethical and societal responsibility.

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PROGRAMME OUTCOMES (POs) of B.Tech. (Civil Engineering)

The Graduates of the programme will be able to:

PO 1 : **Engineering Knowledge:** Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO 2 : **Problem Analysis:** Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO 3 : **Design/ Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

PO 4 : **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.

PO 5 : **Modern Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6 : **The Engineer and Society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

PO 7 : **Environment and Sustainability:** Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

PO 8 : **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

PO 9 : **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

PO 10 : **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO 11 : **Project Management and Finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12 : **Life-long Learning:** Recognize the need for and have the preparation and ability to Engage in independent and life- long learning in the broadest context of technological.

PSO 1 : Understand, analyze and design the solutions for problems in the field of civil engineering.

PSO 2 : Update research knowledge in Civil Engineering to solve the indefinite issues that they have not encountered before.

PSO3 : Identify and recommend suitable environment, health and safety factors involved in planning and execution of civil engineering infrastructure.

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Course Outcomes for B.Tech – Civil Engineering (R18) for the year 2018-19

Course Outcome	Semester : I-Semester	**Subject Name (Code):** Linear Algebra and Calculus (B18ma01)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations.			
2	Solve the applications on the mean value theorems.			
3	Find the Eigen values and Eigen vectors.			
4	Reduce the quadratic form to canonical form using orthogonal transformations.			
5	Analyze the nature of sequence and series.			
6	Evaluate the improper integrals using Beta and Gamma functions.			
7	Find the extreme values of functions of two variables with/ without constraints.			
Course Outcome	Semester : I-Semester	**Subject Name (Code):** English (B18EN01)	No. of Hours : **L:4 T: 0 P: 0**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Use English Language effectively in spoken and written forms.			
2	Comprehend the given texts and respond appropriately.			
3	Communicate confidently in various contexts and different cultures.			
4	Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.			
5	Develops and Communicates by stating main ideas relevantly and coherently in speaking & writing.			
Course Outcome	Semester : I-Semester	**Subject Name (Code):** Engineering Chemistry (B18CH01)	No. of Hours : **L:4 T: 0 P: 0**	**Credits: 2**
After the completion of this course, the students should be able to				
1	The knowledge of molecular and electronic changes, band theory related to conductivity.			
2	The knowledge of water treatment and corrosion.			
3	The knowledge of organic reaction mechanisms and polymers.			
4	The required principles and concepts of electro chemistry and batteries.			
5				
Course Outcome	Semester : I-Semester	**Subject Name (Code):** Engineering Graphics (B18ME01)	No. of Hours : **L:1 T: 0 P: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Introduce Engineering Design and its place in society.			
2	Know the fundamental knowledge of various trades and their usage in real time applications.			
3	Exposure to the visual aspects of Engineering Design, Engineering Graphics standards and solid modeling.			
4				
Course	Semester :	**Subject Name (Code):**	No. of Hours :	**Credits: 4**

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Outcome	I-Semester	Programming For Problem Solving (B18CS01)	**L:4 T: 0 P: 0**	
After the completion of this course, the students should be able to				
1	Understanding how problems are posed and how they can be analyzed for obtaining solutions.			
2	Understanding the fundamentals of C programming.			
3	Learning of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.			
4	Implementing different operations on arrays and creating and using of functions to solve problems.			
5	Ability to design and implement different types of file structures using standard methodology.			
6	Exercise user defined functions to solve real time problems.			
Course Outcome	Semester : I-Semester	**Subject Name (Code):** English Language and Communication Skills Lab (B18EN02)	No. of Hours : **L:0T: 0 P: 2**	**Credits:1**
After the completion of this course, the students should be able to				
1	Neutralization of the influence of the sounds of their mother tongue.			
2	Better understanding of nuances of English language through audio- visual experience and group activities.			
3	Speaking with clarity and confidence which in turn enhances their employability skills.			
4	Using language appropriately for public speaking.			
Course Outcome	Semester : I-Semester	**Subject Name (Code):** Programming for Problem Solving – Lab (B18CS02)	No. of Hours : **L:0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Understanding how problems are posed and how they can be analyzed for obtaining solutions.			
2	Understand basic Structure of the C-PROGRAMMING, declaration and usage of variables.			
3	Write C programs using operators.			
4	Learning of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.			
5	Implementing different operations on arrays and creating and using of functions to solve problems.			
6	Ability to design and implement different types of file structures using standard methodology.			
Course Outcome	Semester : II-Semester	**Subject Name (Code):** Differential Equations and Vector Calculus (B18MA02)	No. of Hours : **L:3 T: 1 P: 0**	**Credits: 4**

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After the completion of this course, the students should be able to				
1	Identify whether the given differential equation of first order is exact or not			
2	Solve higher differential equation and apply the concept of differential equation to real world problems			
3	Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and gravity for cubes, sphere and rectangular parallel piped			
4	Evaluate the line, surface and volume integrals and converting them from one to another			
Course Outcome	Semester : II-Semester	**Subject Name (Code):** Engineering Physics (B18PH03)	No. of Hours : **L:4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	The student learns about transformation concept learns basics of quantum mechanics.			
2	The student gains knowledge on basics of rigid body dynamics and lasers which leads to new innovations and improvements.			
3	The knowledge of physics relevant to engineering is critical for converting ideas into technology.			
4	Characterization and study of properties of optodevices helps the students to prepare new materials for various engineering applications.			
Course Outcome	Semester : II-Semester	**Subject Name (Code):** Engineering Mechanics (B18CE01)	No. of Hours : **L:3 T: 1 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Understand the force system and Degree of freedom.			
2	Understand the special force system.			
3	Develop algebraic relationships among Key physical parameters and variables based on analysis of a specified system.			
4	Apply the principles of mechanics for solving practical problems related to equilibrium of rigid bodies and particle in motion.			
5	Apply the dynamic, motion principles in engineering field.			
Course Outcome	Semester : II-Semester	**Subject Name (Code):** Engineering Workshop/ IT Workshop (B18ME02)	No. of Hours : **L:0 T: 0 P: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Know the fundamental knowledge of various trades and their usage in real time applications.			
2	Gain knowledge of foundry, welding, black smithy, fitting, machine shop and house wiring.			
3	Understand the basis for analyzing power tools in construction and wood working, electrical engineering and mechanical engineering.			
4	Use basic concepts of computer hardware for assembly and disassembly.			
Course Outcome	Semester : II-Semester	**Subject Name (Code):** Engineering Physics Lab (B18PH04)	No. of Hours : **L:0 T: 0 P: 3**	**Credits: 1.5**

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After the completion of this course, the students should be able to				
1	The laboratory course helps the student how to operate different equipments related to engineering. It also allows the student to develop experimental skills to design new experiments in engineering.			
2	The Course Enlightens The Student About Modern Equipment Like Solar cell, Optical Fibre Etc.,			
3	With the exposure to these experiments, the student can compare the theory and correlate with experiment.			
Course Outcome	Semester : III-Semester	**Subject Name (Code):** Probability and Statistics (B18MA04)	No. of Hours : **L:3 T: 1 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Use Probability Theory And Deals With Modelling uncertainty And Apply Discrete And Continuous Probability, In Order To Evaluate The Probability Of Real World Events.			
2	Develop discrete probability distributions and its applications, and use these techniques to generate data from binomial and poisson distributions.			
3	Develop Continuous Probability Distributions And Its Applications, And Use These Techniques To Generate Data From Normal Distribution.			
4	Perform Correlation Analysis, In Order To Estimate The Nature And The Strength Of The Linear Relationship That May Exist Between Two Variables Of Interest, Perform Regression Analysis To Estimate The Magnitude Of Change In One Variable Due To A Given Change In The Other Variable.			
5	Construct confidence interval estimates for population parameters and conduct Hypothesis Tests concerning ppopulation parameters, for single and multiple populations based on sample data. And also perform student t-test, f-test and x^2- test (chi-square).			
Course Outcome	Semester : III-Semester	**Subject Name (Code):** Strength of Materials – I (B18CE02)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Outline the various stresses and strains.			
2	Draw the shear force and bending moment diagram for different beams.			
3	Evaluate the flexural and shear stresses for various sections.			
4	Calculate the slope and deflection of determinant beams.			
5	Identify the concepts of torsion and spring subjected to loading.			
Course Outcome	Semester : III-Semester	**Subject Name (Code):** Fluid Mechanics (B18CE03)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				

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1	Demonstrate the basic properties of fluids and the principles of manometer.			
2	Compute dimensional flows of a pipe applying continuity equation.			
3	Calculate measurement of flow by Eulers and Bernoulli's equation.			
4	Differentiate laminar and turbulent flow and various losses in pipe flow.			
5	Determine drag force and lift force of hydraulic structure			
Course Outcome	Semester : III-Semester	**Subject Name (Code):** Surveying (B18CE04)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Identify the classification of surveying and its instruments.			
2	Calculate the horizontal and vertical angle using Tacheometric surveying.			
3	Understand the process of control surveying and adjustments.			
4	Know the concept of Hydrographic and Astronomical surveying.			
5	Understand the principle of Total station and GPS surveying.			
Course Outcome	Semester : III-Semester	**Subject Name (Code):** Strength of Materials Lab (B18CE05)	No. of Hours : **L:0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Identify the bending behavior of beams using bending test.			
2	Determine the behavior of material under torsion.			
3	Determine the hardness of materials using different test.			
4	Find out the characteristic of material using compression, impact and shear test.			
Course Outcome	Semester : III-Semester	**Subject Name (Code):** Surveying Lab (B18CE06)	No. of Hours : **L:0 T: 0 P: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Calculate area of given plot/points using chain survey.			
2	Determine the angle/distance of given points using compass survey.			
3	Find out the angle, distance and height of the given points using theodolite surveying.			
4	Determine the distance of the given points using Total station.			
Course Outcome	Semester : III-Semester	**Subject Name (Code):** Environmental Sciences (B18MC02)	No. of Hours : **L:2 T: 0 P: 0**	**Credits: 0**
After the completion of this course, the students should be able to				
1	Recall previously learned ecosystem and find how the biodiversity changes went in the environment.			
2	Demonstrate outlines of types of pollutions and related to day-to-day life. Organize important seminars on natural resources.			
3	Apply models of food chains and energy flow models to solve the identified parameters.			
4	Classify the types of pollutants and distinguish the functions of sustainable development			

	that take part in the environment.			
5	Design the experiments with BOD, COD, OD and to estimate the micro organisms which cause contamination and can propose solutions.			
Course Outcome	Semester : IV-Semester	**Subject Name (Code):** Building Materials and Construction Planning (B18CE07)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Categorize stone and brick material with their properties.			
2	Contrast the importance of concrete and its properties.			
3	Outline the different building components.			
4	Explain different building services and NBS/IS norms.			
5	Build knowledge about masonry and finishing work.			
Course Outcome	Semester : IV-Semester	**Subject Name (Code):** Strength of Materials – II (B18CE08)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Analysis the fixed and continuous beams			
2	Evaluate the direct and bending stresses of different structures			
3	Determine the critical load of columns and stresses developed in thick and thin cylinders			
4	Understand the concept of principal stresses and strain energy			
5	Analyze the unsymmetrical bending of beams and shear centre for different section			
Course Outcome	Semester : IV-Semester	**Subject Name (Code):** Hydraulics & Hydraulic Machinery (B18CE09)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Apply fundamental knowledge in open-channel hydraulics in Civil Engineering			
2	Describe dimensional analysis and similarity to develop hydraulic model			
3	Understand about the turbo-machines and its efficiency			
4	Gain knowledge of hydraulic turbines and their operational design			
5	Evaluate the performance of centrifugal pumps and hydropower plants			
Course Outcome	Semester : IV-Semester	**Subject Name (Code):** (B18CE10) Structural Analysis - I	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Build knowledge about energy principles and computing deflection of beams			
2	Analyze the different types of arches			
3	Gain knowledge about cables and suspension bridges			
4	Analyses the propped cantilever and continuous beam			

5	Contrast the concept of plastic analysis of structures			
Course Outcome	Semester : IV-Semester	**Subject Name (Code):** Engineering Geology (B18CE11)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand properties of rocks within the framework of fundamental concepts of basic sciences and with emphasis on their practical utility in civil engineering			
2	Model physical and mechanical properties of rocks and rock mass through quantification			
3	Justify importance of residual stresses in rock mass and to model the redistribution of stresses during			
4	Identify subsurface information and groundwater potential sites through geophysical investigation			
5	Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels			
Course Outcome	Semester : IV-Semester	**Subject Name (Code):** Basic Mechanical Engineering (B18ME52)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Identify the Various Energy sources and IC engines systems			
2	Apply the Metal removal process using Lathe, drilling and Milling operations			
3	Compare the application and usage of various engineering Materials			
4	Analyze the Principle of operation of Impulse and reaction turbine			
5	Discuss the importance of engineering materials			
Course Outcome	Semester : IV-Semester	**Subject Name (Code):** Fluid Mechanics & Hydraulic Machinery Lab (B18CE12)	No. of Hours : **L:0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Calibrate flow measuring devices used in pipes, channels and tank			
2	Demonstrate practical understanding of the minor and friction losses in pipe flows and characterize laminar and turbulent flows			
3	Demonstrate a practical working of Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines			
4	Compare the results of analytical models introduced in a lecture to the actual behavior of real fluid flows and draw correct and sustainable conclusions			
Course Outcome	Semester : IV-Semester	**Subject Name (Code):** Engineering Geology Lab (B18CE13)	No. of Hours : **L:0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				

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1	Learn about the ground surface features based on map patterns of contour within the framework of fundamental concepts of basic sciences with emphasis on practical application in civil engineering			
2	Identify physical and mechanical properties of rocks and minerals and its application in civil engineering uses			
3	Measure strike and dip of the bedding planes			
4	Interpret and draw the sections for geological maps showing horizontal beds, vertical beds, inclined beds, folds, faults			
Course Outcome	Semester : IV-Semester	**Subject Name (Code):** Building Drawing Lab – Cad (B18CE14)	No. of Hours : **L: 0 T:1 P: 2**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Use the usage of AutoCAD commands			
2	Draw the plan and elevation of the building structures			
3	Draw the 2D & 3D building elements			
4	Detail the building components in Auto CAD drawings			
Course Outcome	Semester : IV-Semester	**Subject Name (Code):** Indian Constitution (B18MC04)	No. of Hours : **L:2 T: 0 P: 0**	**Credits: 0**
After the completion of this course, the students should be able to				
1	Have general knowledge and legal literacy about Indian Constitution and thereby it helps to take up competitive examinations & to manage/face complex societal issues in society			
2	Understand state and central policies (Union and State Excutive), fundamental Rights & their duties			
3	Understand Electoral Process and special provisions in Constitution			
4	Understand the Amendments in Indian Constitution			
5	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, with Human Rights and NHRC			
Course Outcome	Semester : V-Semester	**Subject Name (Code):** Design of Steel Structures (B18CE15)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Explain and Design the connections			
2	Analyse and Design the tension, compression members			
3	Design the beams on plastic moment and the eccentric connections			
4	Design the plate girder and various stiffeners			
5	Analyse and Design the components of roof trusses			
Course Outcome	Semester : V-Semester	**Subject Name (Code):** Geotechnical	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**

		Engineering (B18CE16)		
After the completion of this course, the students should be able to				
1	Identify the problems in founding strata and suggest economically feasible solutions through systematic analysis			
2	Analyse the water flow and providing solutions to counter the hydraulic pressures			
3	Awareness of the classical concepts of soil mechanics and its necessity			
4	Ability to analyze the consolidation settlements			
5	Understand the principles of compaction to improve the soil stratum			
Course Outcome	Semester : V-Semester	**Subject Name (Code):** Concrete Technology (B18CE17)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Develop an advanced knowledge of the mechanical performance of cement based materials and how it can be controlled			
2	Use various chemical admixtures and mineral additives to design cement based materials and use advanced laboratory techniques to characterize cement-based materials			
3	Determine the properties of concrete ingredients i.e. cement, sand, coarse aggregate by conducting different tests			
4	Recognize the effects of the rheology and early age properties of concrete on its long-term behavior			
5	Understand the mix design and engineering properties of special concretes such as high-performance concrete, self-compacting concrete, fiber reinforced concrete, etc			
Course Outcome	Semester : V-Semester	**Subject Name (Code):** Engineering Hydrology (B18CE18)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Determine the quantity of precipitation available for a given catchment area			
2	Apply different methods to formulate the velocity of stream flow			
3	Discuss the importance of estimation of runoff, analysis of rainfall data and various hydrographs such as unit hydrograph, flood hydrograph and synthetic unit hydrograph			
4	Make use of Techniques of the Hydrograph to forecast Flood discharge at various duration			
5	Build the necessary theoretical background of ground water hydrology, types of aquifers and their yields			
Course Outcome	Semester : V-Semester	**Subject Name (Code):** Structural Analysis-II (B18CE33)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Analysis the portal frames by slope deflection method and learn to draw the shear force			

	and bending moments diagram for frames			
2	Apply the method of approach to analysis of portal frame by moment distribution method			
3	Able to analysis beams and frames by Kani's method and Approximation method			
4	Analyze the continuous beam, Pin jointed plane frame using the flexibility of stiffness method			
5	Gain knowledge to calculate the Shear force and bending moment on the influence line			
Course Outcome	Semester : V-Semester	**Subject Name (Code):** Remote Sensing (B18CE34)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the terminology, concept of remote sensing, types of radiation			
2	Understand different characteristics of platforms, types of data acquisition systems			
3	Able to understand the image formations, analyse the corrections			
4	Apply the linear and non-linera techniques in image enhacements			
5	Apply the remote sensing in engineering and science streams			
Course Outcome	Semester : V-Semester	**Subject Name (Code):** Environmental Impact Assessment (B18CE35)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Acquire the knowledge of Environmental impacts, control and regulations			
2	Understand environmental clearances and guidelines			
3	Understands environment laws and regulations			
4	Acquire Knowledge to prepare an audit report			
5	Prepare EIA reports and environmental management plans			
Course Outcome	Semester : V-Semester	**Subject Name (Code):** Managerial Economics and Financial Analysis (B18MB01)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the nature, scope and importance of Managerial Economics			
2	Know what is demand, analyze demand and how elasticity of demand is used for pricing decisions and to evaluate methods for forecasting demand			
3	Know how production function is carried out to achieve least cost combination of Inputs and how to analyze cost			
4	Understand the characteristics of different kinds of markets and outline different form of business organization and analyze how capital budgeting techniques are used for investment decisions			
5	Know how to prepare final accounts and how to interpret them, analyze and interpret financial statements using ratio analysis			

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Course Outcome	Semester : V-Semester	**Subject Name (Code):** Concrete Technology Lab (B18CE19)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Understand about the test on cement and aggregate			
2	Evaluate the workability of fresh the concrete			
3	Determine the strength characteristics of harden concrete			
4	Gain knowledge of non-destructive test on concrete			
Course Outcome	Semester : V-Semester	**Subject Name (Code):** Geo Technical Engineering Lab (B18CE20)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Classify soils and appropriately designate them			
2	Calculate the permeability value of soil			
3	Determine engineering properties of soil and suggest suitable field improvements			
4	Determine the shear strength properties of soil			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Design of RC Structures (B18CE21)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Design the singly reinforced, doubly reinforced and flange sections			
2	Design the RC beams under flexure, shear and torsion			
3	Design the one-way slab, two-way slab and staircase			
4	Design the axially loaded, uniaxial and biaxial bending columns			
5	Design the isolated square, rectangular and circular footings			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Irrigation Engineering (B18CE22)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	List out the concepts, techniques and modernization of Irrigation and Learn about irrigation water management on-farm development and command area development			
2	Distribution systems for canal irrigation and the basics of design of			
3	Unlined and lined irrigation canal design			
4	Analyze gravity and earth dams			
5	Plan and design diversion Headworks			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Highway Engineering (B18CE23)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**

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After the completion of this course, the students should be able to				
1	Analyze the planning process required for highways and design the geometric features			
2	Describe design element: sight distance, horizontal curvature, super elevation, grades, visibility on vertical curves, cross section elements			
3	Know the concept of traffic volume and importance of road markings			
4	Recommend suitable highway materials and design of flexible, rigid pavement			
5	Design overlay, analyze the causes for failure of flexible and rigid pavement			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Foundation Engineering (B18CE36)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand soil exploration methods and calculate the bearing capacity of soils			
2	Detect the failures in slopes and suggest appropriate improvement methods			
3	Determine the earth pressures and provide sustainable retaining structures			
4	Analyze and design shallow foundations			
5	Analyze and design deep foundations			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Advanced Surveying (B18CE37)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the traiangulation method, system, baseline measurements and corrections			
2	Apply different methods to find locations			
3	Understand the basic principles of theodolite, photogrammetric measurements, aerial camera views			
4	Understand the terminology and concepts of astronomical surveying, different types of systems			
5	Apply the knowledge of Total Station and GPS in surveying			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Ground Improvement Techniques (B18CE38)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Select the ground improvement technique which is suitable and economical for soil strengthening			
2	Select different techniques based on the various types of soils in-situ			
3	Design reinforced earth structures			
4	Apply the knowledge of geo-synthetic material for usage			
5	Apply the knowledge of modification by confinement			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Rehabilitation & Retrofitting of Structures	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**

		(B18CE39)		
After the completion of this course, the students should be able to				
1	Understand about distress & damage of structures			
2	Understand about practical and NDT			
3	Understand about corrosion of steel reinforcement			
4	Understand about different techniques of repairs of Structures			
5	Understand the Health Monitoring of Structures by Sensors			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Geographical Information System (B18CE40)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand The Concept Of Cadastral Maps			
2	Able To Identify Ground Points, Different Sources Of Map Information			
3	Able To Coordinate The Points Through Digital			
4	Understand The Basics Of Open Source Software			
5	Applying The GIS In The Maps With Alignemts			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Construction Management (B18CE41)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the management theories,roles,decision making techniques			
2	Understand network techniques, management and its applications CPM & PERT			
3	Able to get knowledge on resource planning, methods of budgets			
4	Understand the concepts of contract, types of contract			
5	Learn about legal and financial aspects, safety systems			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Human Values And Professional Ethics (B18EN04)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	It ensures students sustained happiness through identifying the essentials of human values and skills			
2	It facilitates a correct understanding between profession and happiness			
3	It helps students understand practically the importance of trust, mutually satisfying human behavior and enriching interaction with nature			
4	Ability to develop appropriate technologies and management patterns to create harmony in professional and personal life			
Course	Semester :	**Subject Name (Code):**	No. of Hours :	**Credits: 3**

Outcome	VI-Semester	Database Management Systems (B18CS04)	**L:3 T: 0 P: 0**	
After the completion of this course, the students should be able to				
1	Ability to understand the fundamental concepts of database management			
2	Ability to analyze database models & Entity Relationship models and to draw the E-R diagram for the given case study			
3	Apply relational Database Theory, and be able to write relational algebra expressions for queries			
4	Utilize the knowledge of basics of SQL and construct queries using SQL			
5	Apply Normalization Process to construct the database. Explain Basic Issues of transaction processing			
6	Understand Concurrency control and Recovery strategies of DBMS			
7	Compare the basic Database storage structures and access techniques: File Organization, indexing methods including B- Tree and Hashing			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Power Plant Engineering (B18ME36)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the layout of power generation units for different energy sectors			
2	Identify different subsystem and systems of power generation sector			
3	Compare existing and emerging alternative energy sources			
4	Analyze the opportunities in contributing towards the solving of energy crisis			
5	Discuss general arrangement of power distribution			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Advanced English Communication Skills Lab (B18EN03)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Developing effectively and appropriate vocabulary to be used contextually			
2	Inculcating flair for Writing and felicity in written expression			
3	Enhancing job prospects			
4	Acquiring effective speaking abilities			
Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Highway Engineering Lab (B18CE24)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Characterize the pavement materials based on properties			
2	Perform quality control tests on pavement materials			
3	Gain knowledge on basic understanding of mix design			
4	Understand the salient features of traffic studies			

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Course Outcome	Semester : VI-Semester	**Subject Name (Code):** Structural Design and Detailing Lab (B18CE25)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 1.5**
After the completion of this course, the students should be able to				
1	Draw and show the detailing of reinforcement in footings			
2	Draw and show the detailing of reinforcement of different types of columns			
3	Draw and show the detailing of reinforcement of different types of beams			
4	Draw the steel structures			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):** Estimation And Valuation Practice (B18CE26)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Evaluate the detailed estimate of RC building			
2	Evaluate the rate for construction activities			
3	Prepare the report and tender for the contact works			
4	Understands what type of contract is used for a specific work			
5	Understands the importance of valuation			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):** Environmental Engineering (B18CE27)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Acquire the knowledge of the water borne diseases and Serve the community by making people aware with the different pollution related problems			
2	Demonstrate the steps involved in water filtering			
3	Acquire the knowledge of water distribution system and their fittings			
4	Explain wastewater collection systems & design sewers			
5	Gain knowledge of the different processes of water treatment and would be able to assist in the design of the water treatment plants			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):** Watershed Management (B18CE42)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Comprehend the physical, biological and environmental aspects and their interrelations within a watershed			
2	Identify the causes of soil erosion			
3	Plan and design water harvesting and groundwater recharging structures			
4	Choose and apply available system tools for systematic intervention			
5	Formulate a vision and design a sustainable watershed management plan that shows an			

	integrated approach towards the multiple use of land- and water resources and social equity and economic availability			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):** Transportation Engineering (B18CE43)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand various components and characteristics of traffic			
2	Conduct different traffic studies and analyze the data			
3	Analyze and determine the LOS of highway			
4	Analyze and design the intersections			
5	To know various traffic control devices and principles of highway safety			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):** Bridge Engineering (B18CE44)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Obtain knowledge of bridges and its loading			
2	Design the deck slab and T-Beam bridges			
3	Contrast components and design of plate girder and steel truss bridges			
4	Identify the types of bearing and design of piers and abutments in bridges			
5	Show the importance of bridge inspection and maintenance			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):** Pre Stressed Concrete (B18CE45)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the principles and types of prestressing			
2	Know the methods of prestressing and losses of prestress			
3	Gain knowledge analyze of beams in flexure and shear			
4	Outline the transfer of prestresses force in members			
5	Analyze the composite beam and deflection			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):** Earthquake Engineering (B18CE46)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Discuss and explain causes of earthquake, Theory of vibration			
2	Discuss and explain the load path, ductility and earthquake design requirements			
3	Analyze and design of earthquake resistant RC structures			
4	Analyze and design of earthquake resistant masonry structures			
5	Discuss the design methodology of structural and non-structural elements			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):**	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**

		Reinforced Earth and Geotextiles (B18CE47)		
After the completion of this course, the students should be able to				
1	Understand the history and mechanism of reinforced soil			
2	Become aware about situations where geosynthetics can be used			
3	Know about various types of geosynthetics and their functions			
4	Be able to do dimple design of reinforced soil retaining walls and reinforced earth beds			
5	Able to apply different types of analysis in simple problems			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):** Entrepreneur Development (B18MB03)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Define the nature of entrepreneur and relate the skills and qualities of entrepreneur to types of ownership			
2	Classify SWOT and summarize the sources of finance			
3	Apply the ethical guidelines for business			
4	Identify the shadow economy and political issues			
5	Assess the issues of corporate governance and Improve the professional ethics			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):** Industrial Management (B18MB05)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Define Entrepreneurship and Organization			
2	Design Organizational structures and its uses			
3	Estimate the cost and time for projects with the help of PERT and CPM			
4	Explain the work and make use of work study techniques			
5	Solve the various problems in operation management			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):** Digital Image Processing (B18EC24)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Gain the knowledge of digital image fundamentals and image transforms			
2	Discuss the analysis of image enhancement in spatial and frequency domain			
3	Understand the different methods to restore an image			
4	Inspect different image segmentation techniques and understand morphological image processing			
5	Analyze the different image compression techniques			
Course Outcome	Semester : VII-Semester	**Subject Name (Code):** Environmental Engineering Lab	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**

		(B18CE28)		
After the completion of this course, the students should be able to				
1	Test water and wastewater samples to determine p^H and conductivity			
2	Determine BOD and COD of water			
3	Determine chloride content in water			
4	Estimate quality of water and wastewater			
Course Outcome	Semester : VIII-Semester	**Subject Name (Code):** Pavement Design (B18CE48)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Contrast the factors effecting the pavements			
2	Expose to the analysis concepts and procedures for stresses, strains and deflection in pavements			
3	Understand the concept of soil modification and its suitability as ground improvement method			
4	Obtain the knowledge of design of flexible and rigid pavements by different methods			
5	Illustrate the design of pavement for low volume roads and overlays			
Course Outcome	Semester : VIII-Semester	**Subject Name (Code):** Solid Waste Management (B18CE49)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Acquire the knowledge of solid waste management			
2	Explain solid waste disposal techniques			
3	Acquire the knowledge of Biomedical waste disposal techniques			
4	Select the appropriate method for solid waste collection, transportation, redistribution and disposal			
5	Acquire the knowledge of e- waste disposal techniques			
Course Outcome	Semester : VIII-Semester	**Subject Name (Code):** Finite Element Method (B18CE50)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Introduction to finite element method and define stress strain equation			
2	Derive equations in finite element methods for 1Dand 2Dproblems			
3	Formulate and solve basic problems in structural mechanics using different elements			
4	Identify and formulate mathematical models for solution of simple and common engineering problems into finite element			
5	Appreciate the importance of ethical issues pertaining to the effective utilization of FEA			
Course	Semester :	**Subject Name (Code):**	No. of Hours :	**Credits: 3**

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Outcome	VIII-Semester	Intellectual Property Rights (B18MB06)	**L:3 T: 0 P: 0**	
After the completion of this course, the students should be able to				
1	Outline the increasing importance of intellectual property rights			
2	Utilize post registration procedures and trade mark registration process			
3	Explain the copyright principles and rights			
4	Prioritize the law of patents and patent ownership			
5	Develop the trade secret and maintenance			
Course Outcome	Semester : VIII-Semester	**Subject Name (Code):** Nanotechnology (B18ME25)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the fundamentals of Nanotechnology			
2	Analyze the different classes of nano materials			
3	Differentiate techniques involved in Nanotechnology			
4	Compare nanotechnology potentialities			
5	Estimate oxidation and metallization Mask and its application			
Course Outcome	Semester : VIII-Semester	**Subject Name (Code):** Non-Conventional Energy Sources (B18ME42)	No. of Hours : **L:3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Apply the technology to capture the energy from the renewable sources like sun, Wind, ocean, biomass, geothermal			
2	Compare different renewable energy sources to produce electrical power minimize the use of conventional energy sources to produce electrical energy			
3	Identify the fact that the conventional energy resources are depleted			
4	Understand direct energy conversion			
5	Differentiate limitations and principles of direct energy conversion			