VAAGDEVI COLLEGE OF ENGINEERING

Autonomous

Bollikunta, Warangal Urban-506 005 (T.S)

DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOMES (CO's) FOR B.TECH – CIVIL ENGINEERING (R20)

Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Linear Algebra and Vector Calculus (B20MA04)	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 principles of matrix to calculate the characteristics of system of linear equations using multiple methods.
2	Determine Eigen values, Eigenvectors of matrices.
3	Evaluate limits of single-variable functions graphically and computationally.
4	Analyze improper integrals using Beta and Gamma functions.
5	Calculate Partial derivatives, extreme of functions of multiple variables. CO5: Analyse line, surface and volume integrals using fundamental theorems.

Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Applied Physics (B20PH04)	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 the laws of mechanics to determine the equilibrium condition of particles and rigid bodies.
2	Explain the elastic properties of materials.
3	Understands the basic concepts in Nondestructive techniques and their applications.
4	Explain the knowledge of waves and the factors affecting acoustics of buildings and their remedies.
5	Calculate geometric properties like Centre of gravity moment of inertia and mass

Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Basic Mechanical Engineering (B20ME05)	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	Year / Semester : I / I-Sem	**Subject Name (Code):** Programming for Problem Solving (B20CS01)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**

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	Learning of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.			
3	Implementing different operations on arrays and creating and using of functions to solve problems.			
4	Understanding and exploring the various methods of memory allocations.			
5	Ability to design and implement different types of file structures using standard methodology.			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Physics Lab (B20PH05)	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	Estimate the frequency of tuning for and AC supply with the help of stretched strings.			
2	Analyze as well as compare the intensity distribution of interference and diffraction patterns.			
3	Draw the characteristics of electrical and electronic circuits and evaluate the dependent parameters.			
4	Explore and understand the applications of semiconducting devices.			
5	Evaluates the wavelength and radius of curvature of Plano convex lens by Newton's rings.			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Programming for Problem Solving Lab (B20CS02)	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	Understand basic structure of the C Programming, data types, declaration and usage of variables, control structures and all related concepts.			
2	Ability to understand any algorithm and Write the C programming code in executable form.			
3	Implement Programs using functions, pointers and arrays, and use the pre-processors to solve real time problems.			
4	Ability to use file structures and implement programs on files			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Engineering Workshop (B20ME04)	No. of Hours : **L: 0 T:0 P: 2**	**Credits: 1**
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	Compare Foundry, Welding, Black smithy, Fitting, Machine shop and house wiring.			
3	Understand the basis for analyzing power tools in construction and wood working, electrical engineeringand mechanical engineering.			
4	Apply basic concepts of computer hardware for assembly and disassembly.			

Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Induction Program (B20MC01)	No. of Hours : **L: 0 T: 0 P: 0**	**Credits: 0**
After the completion of this course, the students should be able to				
1	NA			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Differential Calculus and Transforms (B20MA06)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Apply the fundamental concepts of ordinary differential equations toreal time problems.			
2	Find the complete solution of a non homogeneous differential equationsand applying its concepts in solving physical problems of Engineering.			
3	Evaluate initial value problems and boundary value problems using Laplace transforms technique.			
4	Expand the algebraic and transcendental functions by applying Fourier Series.			
5	Apply the concepts of Partial Differential Equations to Engineering problems.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Applied Chemistry (B20CH03)	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 knowledge of molecular batteries and corrosion			
2	The knowledge of water treatment.			
3	The knowledge of polymers and their uses.			
4	The required knowledge of principles and concepts of phase rule and surface chemistry.			
5	The knowledge of materials and their uses.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Engineering Mechanics (B20CE01)	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 concepts of resultant force and moment Systems.			
2	Analyze problems related to friction developed in motion of bodies.			
3	Calculate centroid and moment of inertia for simple and composite sections.			
4	Apply concepts of mechanics to solve problems of rigid body motion.			
5	Understand the application of Work Energy method for plane motion problems.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Basic Electrical and Electronics Engineering (B20EE01)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Analyze circuit theorems, mesh and nodal analysis, series and parallel networks, Electrical power.			

2	Gain knowledge on AC circuits, reactance, Impedance, Susceptance and Admittance and Power Factor			
3	Learn the working principle of DC motors, Transformers.			
4	Study the characteristics of PN Junction diode and zener diode.			
5	Learn the basic of Amplifiers and Rectifiers.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** English for Effective communication (B20EN01)	No. of Hours : **L: 2 T: 0 P: 0**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Skim and scan the digital text to summarize it for future reference.			
2	Read the text to make notes according to their needs.			
3	Use English language effectively in spoken and written forms.			
4	Communicate confidently in various contexts and different cultures.			
5	Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Python Programming Lab (B20CS07)	No. of Hours : **L: 0 T: 1 P: 2**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Expressing the Core Python scripting elements such as variables and flow control structures.			
2	Apply Python functions to facilitate code reuse.			
3	Extending how to work with lists and sequence data.			
4	Implement file operations such as read and write and Adapting the code robust by handling errors and exceptions properly.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Engineering Drawing (B20ME01)	No. of Hours : **L: 0 T: 0 P: 4**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Understand various commands, object properties in AUTOCAD.			
2	Analyse the Projections of Points and solids.			
3	Estimate the use of drawings, dimensioning, scales and conic sections.			
4	Compare the Conversion of Isometric views to Orthographic views.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Probability Distribution and Numerical Methods (B20MA08)	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 for modelling uncertainty in engineering problems			
2	Develop discrete and continuous probability distribution and its applications.			

3	Construct confidence interval estimates for population parameters to test the hypothesis.			
4	Find a better approximate root of a given equation.			
5	Compute the differential equation using Numerical techniques.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Strength of Materials - 1 (B20CE02)	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 stresses and strains in the members.			
2	Draw shear force and Bending moment diagram for determinate beams.			
3	Identify the flexural and shear stresses for various sections.			
4	Evaluate the slope and deflection of determinate beams.			
5	Identify the concept of torsion and spring subjected to loading			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Fluid Mechanics (B20CE03)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Learn the fundamentals of fluids and the principles of manometer.			
2	Compute dimensional flow in a pipe applying continuity equation.			
3	Calculate the flow parameters by Euler's and Bernoulli's equation.			
4	Differentiate laminar and turbulent flow and various losses in pipe flow.			
5	Determine Boundary layer thickness, Drag-Lift forces.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Surveying (B20CE04)	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 instruments used.			
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.			
	Understand the principles of Total station and GPS surveying.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Construction Materials (B20CE05)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Compare the properties of most common and advanced building materials.			
2	Understand the typical and potential applications of lime, cement and aggregates.			
3	Know the Rudiments of production of concrete.			
4	Understand application of timbers and other materials.			

5	Understand the importance of modern material for construction.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Strength of Materials Lab (B20CE06)	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 tests.			
4	Find out the characteristic of material under compression, impact and shear test.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Surveying Lab (B20CE07)	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	Year / Semester : II / III-Sem	**Subject Name (Code):** English Language and Interactive Communication Skills Lab (B20EN02)	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	Understand the nuances of English language through audio-visual experience and group activities.			
2	Speak with clarity and confidence which in turn enhances their employability skills.			
3	Develop their listening skills so that they may appreciate its role in developing LSRW skills language and improve their pronunciation.			
4	Involve the students in speaking activities in various contexts.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Project Based Learning - 1 (B20CE08)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	NA			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Human Values and Professional Ethics (B20MC04)	No. of Hours : **L: 2 T: 0 P: 0**	**Credits: 0**
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 Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Strength Materials - 2 (B20CE09)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Analyse 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	Year / Semester : II / IV-Sem	**Subject Name (Code):** Hydraulics and Hydraulic Machinery (B20CE10)	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 pump			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Structural Analysis - 1 (B20CE11)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Analyze continuous beams, pin-jointed indeterminate plane frames and rigid plane frames by strain energy method.			
2	Analyse continuous beams and rigid frames by slope deflection method.			
3	Understand the concept of moment distribution and analyse continuous beams and rigid frames with and without sway.			
4	Analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.			
5	Understand the concept of matrix stiffness method and analyse of continuous beams, pin jointed trusses and rigid plane frames.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Engineering Geology (B20CE12)	No. of Hours : **L: 2 T: 0 P: 0**	**Credits: 2**

After the completion of this course, the students should be able to				
1	Understand the importance of geological knowledge such as earth, earthquake, volcanism and the action of various geological agencies.			
2	Gain basics knowledge on properties of minerals.			
3	Gain knowledge about types of rocks, their distribution and uses.			
4	Understand the methods of study on geological structure.			
5	Understand the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbor.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Construction Techniques And Practices (B20CE13)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Know the different construction techniques and structural systems.			
2	Understand various techniques and practices in masonry construction, flooring, and roofing.			
3	Plan the requirements for substructure construction.			
4	Know the methods and techniques involved in construction of various types of super structures.			
5	Select, maintain and operate hand and power tools and equipment used in the building construction sites.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Fluid Mechanics & Hydraulic Machinery Lab (B20CE14)	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 practical working of Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.			
4	Compare results of analytical models with actual behavior of real fluid flows.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Engineering Geology Lab (B20CE15)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Learn about the ground surface features based on map patterns of contour 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 sections for geological maps showing horizontal beds, vertical beds, inclined beds, folds, faults.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Building Drawing Lab - CAD (B20CE16)	No. of Hours : **L: 0 T: 1 P: 2**	**Credits: 2**

After the completion of this course, the students should be able to				
1	Understand the usage of AutoCAD commands.			
2	Able to draw the Plan, Section and elevation of the building structures.			
3	Understand the 2D & 3D building elements.			
4	Detail the building components in Auto CAD drawings.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Project Based Learning - 2 (B20CE17)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	NA			
Course Outcome	Year / Semester : III / V-Sem	**Subject Name (Code):** Design of Steel Structures (B20CE18)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Recognize the design philosophy of steel structures and connections.			
2	Select the suitable section shape and size for tension and compression members.			
3	Able to calculate ultimate load of steel beams and portal frames using plastic analysis.			
4	Able to design beams, Built-up beams and plate girders.			
5	Identify and compute the design trusses on Industrial structures.			
Course Outcome	Year / Semester : III / V-Sem	**Subject Name (Code):** Geotechnical Engineering (B20CE19)	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 properties and characteristics of soils.			
2	Analyze permeability and seepage through soils.			
3	Ability to analyze the stress distribution and consolidation settlement.			
4	Understand the principles of shear strength of soils.			
5	Able to know site investigation methods and Testing of soils.			
Course Outcome	Year / Semester : III / V-Sem	**Subject Name (Code):** Concrete Technology (B20CE20)	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 knowledge on the concrete mix proportioning and manufacturing.			
2	Understand the properties of concrete in fresh and hardened state.			
3	Ability to know development of High Strength and High Performance Concrete.			
4	Understand the importance of durability of concrete.			
5	Identify special concrete and Quality Control during construction.			
Course Outcome	Year / Semester : III / V-Sem	**Subject Name (Code):** Hydrology and Water Resource Engineering (B20CE21)	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 key drivers on water resources and hydrological processes.			
2	Apply the knowledge of hydrological models to surface water problems.			
3	Explain the concept of Flood and Drought and management strategies.			
4	Describe the importance and design water storage reservoirs.			

5	Apply the concepts of groundwater for water resources management.