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 (R22)

Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Matrices and Calculus (B22MA01)	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 analyse the solution of the system of equations.
2	Find the Eigen values and Eigen vectors.
3	Reduce the quadratic form to canonical form using orthogonal transformations.
4	Solve the applications on the mean value theorems.
5	Evaluate the improper integrals using Beta and Gamma functions.
6	Find the extreme values of functions of two variables with/ without constraints.
7	Evaluate the multiple integrals and apply the concept to find areas, volumes.

Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Applied Physics (B22PH01)	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 physical world from fundamental point of view by the concepts of Quantum.
2	Mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.
3	Identify the role of semiconductor devices in science and engineering Applications.
4	Explore the fundamental properties of dielectric, magnetic materials and energy for their applications.
5	Appreciate the features and applications of Nanomaterials.
6	Understand various aspects of Lasers and Optical fibre and their applications in diverse fields.

Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** C Programming and Data Structures (B22CS06)	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 various steps in Program development.
2	Explore the concepts of control statements and functions in C Programming Language.
3	Understand the concepts of pointers and its applications.
4	Ability to design and implement different types of file structures.
5	Apply data structures such as stacks, queues in problem solving and analyze various searching and sorting algorithms.

Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Engineering Workshop (B22ME01)	No. of Hours : **L: 0 T: 1 P: 3**	**Credits: 2.5**
After the completion of this course, the students should be able to				
1	Study and practice on machine tools and their operations			
2	Practice on manufacturing of components using workshop trades including pluming, fitting,			
3	Identify and apply suitable tools for different trades of Engineering processes including			
4	Apply basic electrical engineering knowledge for house wiring practice.			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** English for Skill Enhancement (B22EN01)	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 vocabulary and sentence structures.			
2	Choose appropriate vocabulary and sentence structures for their oral and written communication.			
3	Demonstrate their understanding of the rules of functional grammar.			
4	Develop comprehension skills using known and unknown passages.			
5	Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Elements of Civil Engineering (B22CE01)	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 the importance of vocabulary and sentence structures.			
2	Choose appropriate vocabulary and sentence structures for their oral and written communication.			
3	Demonstrate their understanding of the rules of functional grammar.			
4	Develop comprehension skills using known and unknown passages.			
5	Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Applied Physics Laboratory (B22PH02)	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 determination of the Planck"s constant using Photo electric effect and identify the			
2	Appreciate quantum physics in semiconductor devices and optoelectronics.			
3	Gain the knowledge of applications of dielectric constant.			
4	Understand the variation of magnetic field and behavior of hysteresis curve.			
5	Gain the knowledge of decay of charge and determine time constant of RC circuit.			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** C Programming and Data Structures Laboratory (B22CS07)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**

After the completion of this course, the students should be able to				
1	Develop modular and readable C Programs			
2	Solve problems using strings, functions. Handle data in files.			
3	Implement stacks, queues using arrays.			
4	To understand and analyze various searching and sorting algorithms.			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** English Language and Communication Skills Laboratory (B22EN02)	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 the nuances of English language through audio- visual experience and group activities.			
2	Neutralize their accent for intelligibility.			
3	Develop their listening skills so that they may appreciate its role in developing LSRW skills of language and improve their pronunciation.			
4	Involve in speaking activities in various contexts.			
5	Speak with clarity and confidence which in turn enhance their employability skills			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Environmental Science (B22CH03)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 0**
After the completion of this course, the students should be able to				
1	Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Ordinary Differential Equations and Vector Calculus (B22MA02)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 4**
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	Extend the basic concepts of differential calculus to vector functions in a simple and natural fashion.			
4	Extend the basic concepts of differential calculus to vector functions in a simple and natural fashion.			
5	Evaluate the line, surface and volume integrals and converting them from one to another.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Engineering Chemistry (B22CH01)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				

1	Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control.			
2	The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.			
3	They can learn the fundamentals and general properties of polymers and other engineering materials.			
4	They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Computer Aided Engineering Graphics (B22ME03)	No. of Hours : **L: 1 T: 0 P: 4**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Apply computer aided drafting tools to create 2D and 3D objects sketch conics and different types of solids.			
2	Appreciate the need of Sectional views of solids and Development of surfaces of solids.			
3	Read and interpret engineering drawings.			
4	Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Applied Mechanics (B22CE02)	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 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):** Surveying (B22CE04)	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 working principles of survey instruments.			
2	Identify data collection methods and prepare field notes.			
3	Calculate angles, distances and levels and compute areas using theodolite.			
4	Calculate the horizontal and vertical angle using Tacheometric surveying.			
5	Understand the principles of Total station and GPS surveying.			

Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Python Programming Laboratory (B22CS04)	No. of Hours : **L: 0 T: 1 P: 2**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Develop the application specific codes using python.			
2	Understand Strings, Lists, Tuples and Dictionaries in Python.			
3	Understand the structure of exception handling for all general purpose exceptions.			
4	Verify programs using modular approach, file I/O, Python standard library. Implement Digital Systems using Python.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Engineering Chemistry Laboratory (B22CH02)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Able to determine the hardness of water			
2	Able to perform methods such as conductometry, and potentiometry in order to find out the			
3	Students are able to prepare polymers like bakelite and nylon-6,6.			
4	Estimations saponification value, and viscosity of lubricant oils.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Surveying Laboratory - I (B22CE05)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Student will be able to prepare Map and Plan for required site with suitable scale.			
2	Student will be able to prepare contour Map and Estimate the Quantity of earthwork required for formation level for Road and Railway Alignment.			
3	Student will be able to judge which type of instrument to be used for carrying out survey for a Particular Area and estimate the area.			
4	Student will be able to judge the profile of ground by observing the available existing contour map.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Probability and Statistics (B22MA03)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	After learning the contents of this paper the student must be able to			
2	Apply the concepts of probability and distributions to some case studies.			
3	Correlate the concepts of one unit to the concepts in other units.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Building Materials, Construction and Planning (B22CE06)	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 different types of construction material.			
2	Understand the manufacturing of Cement and role of Admixtures.			
3	Identify the concept of building components and services.			
4	Know the importance of Masonry and formwork.			
5	Plan a building based on the factors and principles of planning.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Engineering Geology (B22CE07)	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 importance of geological knowledge in civil engineering point of view.			
2	Gain basics knowledge on properties of mineralogy and petrology.			
3	Gain knowledge about structural geology.			
4	Understand the effects of earthquakes and importance of geophysical studies.			
5	Understand the application of geological investigation in projects such as dams, Reservoirs and tunnels			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Strength of Materials – I (B22CE08)	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 principal stresses and theory of failures.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Fluid Mechanics (B22CE09)	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 broad principles of fluid statics,			
2	Learn the concept of fluid kinematics and dynamics.			
3	Understand the measurement of flow in pipes and notches.			
4	Understand classifications of flow losses through pipes.			
5	Apply the continuity, momentum and energy principles.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Surveying Laboratory - II (B22CE10)	No. of Hours : **L: 0 T: 1 P: 2**	**Credits: 2**

After the completion of this course, the students should be able to				
1	Calculate area of given plot/points using theodolite survey.			
2	Determine the angle/distance of given points using theodolite survey.			
3	Find out the area, distance and elevation of the given points using total station.			
4	Determine the height and plot curve using Total station.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Strength of Materials Laboratory (B22CE11)	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):** Computer Aided Drafting Laboratory (B22CE12)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Plan buildings as per NBC.			
2	Draw brick bonds, Plan, Section and Elevation of buildings.			
3	Develop residential building and public building as per the building by-laws.			
4	Draw Electrical layout, Plumbing layout for buildings.			
Course Outcome	Year / Semester : II / III-Sem	**Subject Name (Code):** Logical Reasoning and Quantitative Aptitude (B22MC08)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 0**
After the completion of this course, the students should be able to				
1	NA			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Basic Electrical and Electronics Engineering (B22EE19)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	To analyze and solve electrical circuits using network laws and theorems.			
2	To understand and analyze basic Electric and Magnetic circuits.			
3	To study the working principles of Electrical Machines.			
4	To introduce components of Low Voltage Electrical Installations.			
5	To identify and characterize diodes and various types of transistors.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Concrete Technology (B22CE13)	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 testing of aggregates and its properties.			
2	Understand the properties of concrete in fresh state.			
3	Comprehend the properties of concrete in hardened concrete.			
4	Ability to know the concept of Elasticity, Creep and Shrinkage.			
5	Identify different types of admixtures and special concrete.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Strength of Materials – II (B22CE14)	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 torsion of circular shafts and springs.			
2	Determine the critical load of columns.			
3	Evaluate the direct and bending stresses of different structures.			
4	Determine the stresses developed in thick and thin cylinders.			
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 Hydraulics Machinery (B22CE15)	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.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Structural Analysis - I (B22CE16)	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 pin-jointed plane frames by different methods.			
2	Analyze three hinged arches and understand the concept of energy theorems.			
3	Understand the Indeterminate beams with rotation of a support.			
4	Analyze the beams using three moments and slope deflection method.			
5	Understand the concept of moving loads and influence lines.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Fluid Mechanics and Hydraulics Machinery Laboratory (B22CE17)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Describe the basic measurement techniques of fluid mechanics and its application.			
2	Demonstrate practical understanding of the minor and friction losses in pipe flows.			
3	Discover 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):** Basic Electrical and Electronics Engineering Laboratory (B22EE20)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**

After the completion of this course, the students should be able to				
1	To analyze and solve electrical circuits using network laws.			
2	To understand and analyze basic Electric and Magnetic circuits.			
3	To study the working principles of Electrical Machines.			
4	To identify and characterize diodes and various types of transistors.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Concrete Technology Laboratory (B22CE18)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 1**
After the completion of this course, the students should be able to				
1	Acquire knowledge on the properties of cement and aggregate.			
2	Evaluate the workability of fresh Concrete.			
3	Determine the strength characteristics of hardened concrete.			
4	Gain knowledge of Non-destructive test on concrete.			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Real-time Research Project/ Field-Based Project (B22CE19)	No. of Hours : **L: 0 T: 0 P: 4**	**Credits: 2**
After the completion of this course, the students should be able to				
1	NA			
Course Outcome	Year / Semester : II / IV-Sem	**Subject Name (Code):** Gender Sensitization Laboratory (B22MC07)	No. of Hours : **L: 0 T: 0 P: 2**	**Credits: 0**
After the completion of this course, the students should be able to				
1	Students will have developed a better understanding of important issues related to gender in contemporary India.			
2	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and films.			
3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter them.Students will acquire insights into the gendered division of labour and its relation to politics and economics.			
4	Students will develop a sense of appreciation of women in all walks of life. Men and women students and professionals will be better equipped to work and live in harmony.			
5	Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.			