VAAGDEVI COLLEGE OF ENGINEERING

Autonomous

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

COURSE OUTCOMES (Cos) - B.Tech – CIVIL ENGINEERING

Course Outcomes for B.Tech – Civil Engineering (R15) for the year 2015-16

Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Mathematics-I (A9001)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Identify order and linearity of differential equation for classical problems.			
2	Develop different models for first order and order differential equations manually and technological based methods.			
3	Judge the consequences and geometrical approach to the mean value theorems and engineering applications to mathematical problems.			
4	Formulate, test different geometries using integral form to compute areas and volumes.			
5	Deduce general solution for initial and boundary value problems using Laplace transform technique and developing advanced aspects in Laplace transform, Adopt Laplace transform techniques to solve second order ordinary differential equations			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** English (A9012)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Equip the components of different forms of communication skills.			
2	Able to guess meanings of words from context and grasp the effective vocabulary.			
3	Recall the enrichment of comprehension and fluency will be adaptable.			
4	Gain confidence in using language in varied situations			
5	Develop and Communicate by stating main ideas relevantly and coherently in speaking & writing.			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Engineering Chemistry(A9011)	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 polymeric engineering materials.			
2	Construct batteries and Classify different electronics and electrical like cells, electrodes, etc., help them to construct different electrical/ electronic parts.			
3	Examine which types of impurities are present in water, specification of drinking water.			
4	Apply phase rule and absorption to construct the materials by analyzing their compositions.			
5	Explain the corrosion behavior of metals/ activity of metals.			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** English Language Communication skills Lab (A9013)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Capable in Better Understanding of nuances of language through audio-visual experience and group activities.			
2	Able to develop Neutralization of accent for intelligibility.			
3	Capable to Speak out with clarity and confidence thereby enhances the employability skills of the students by acquiring knowledge and techniques.			
4	Extends to speak fluent English, through advanced vocabulary to improve quality in speaking.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Mathematics-II(A9002)	No. of Hours : **L: 3 T:1 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Find rank of the matrix by solve system of simultaneous linear system equations.			
2	Find Eigen values and Eigen vectors and analyze the properties of matrix.			
3	Find Fourier Series and Fourier Transforms. Apply Fourier Series and Fourier Transforms con interpret in respective engineering fields.			

4	Evaluate physical quantities involving in engineering fields related to vector valued functions. Categorize the basic properties of vector valued functions and able to solve line, surface and volume integration			
5	Apply a range of techniques to find solutions from standard partial differential equations to diverse situations in Physics, Engineering and other Mathematical contents.			
Course Outcome	Year / Semester : I / II-Sem	**Subject Name (Code):** Engineering Physics(A9009)	No. of Hours : **L: 3 T:0 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Recall basics of crystalline materials and their structures and develop novel crystal structures. Expertise in classification of solids by band theory.			
2	Interpret to calculate number of charge carriers in a semi conductor. Develop fabrication of semi conductors into devices.			
3	Compare dielectrics and magnetic materials along with their engineering applications.			
4	Categories lasers, their construction and applications in engineering field.			
5	Summarize nano materials and their fabrication methods and gain experience in designing and characterization by XRD & SEM.			
Course Outcome	Year / Semester : I / I-Sem	**Subject Name (Code):** Engineering Physics Lab (A9010)	No. of Hours : **L: 0 T:0 P: 3**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Co relate principles with applications of CR, LCR, Circuits.			
2	Enlighten the student about modern equipment like solar cell, optical fibre etc.,			
3	Have exposure to these experiments, the student can compare the theory and correlate with experiment.			
4	Meliorate the knowledge of Lasers, & Light properties.			
Course Outcome	Year / Semester : II / I-Sem	**Subject Name (Code):** Probability and Statistics (A9005)	No. of Hours : **L: 3 T: 0 P: 0**	**Credits: 3**

After the completion of this course, the students should be able to				
1	Summarize the importance of probability and statistics.			
2	Apply the concept of probability application in real life.			
3	Utilize the Probability Distributions in realistic situations.			
4	Construct Linear Regression lines and estimate the values of variables.			
5	Choose the appropriate Testing of Hypothesis. Demonstrate the difference between large and small samples and its applications.			
Course Outcome	Year / Semester : II / I-Sem	**Subject Name (Code): Strength of Material-I (A9101)**	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Understand various types of stresses and the associated strains			
2	Acquire the knowledge in finding SF and BM of the beams for all types of loading and to draw SFD &BMD			
3	Assess the Bending and shear stresses for beams in flexure			
4	Understand the behavior of springs and circular shafts subjected to loading Illustrate simple bars, beams, and circular shafts for allowable stresses and loads			
5	Identify and interpret the governing equation for compound stress and strains and Draw graphical method in arriving stresses and approach to theories of failures			
Course Outcome	Year / Semester : II / I-Sem	**Subject Name (Code): Surveying (A9205)**	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Understand the basics of linear/angular measurement methods like chain surveying, compass surveying			
2	Understand the concepts of leveling and its methods & discuss different methods to plot contour maps			
3	Compute the area and volume for different civil engineering projects			

4	Get expertise in compass and theodolite surveying			
5	Get knowledge about new and advance methods of surveying			
Course Outcome	Year / Semester : II / I-Sem	**Subject Name (Code):** Fluid Mechanics (A9103)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Demonstrate the basic properties of fluids and their application in real world problems and apply the principles of manometer to measure gauge and differential pressures			
2	Calculate velocity and discharge at any section of a pipe applying continuity equation			
3	Calculate total head at any section of a pipe by bernoulli's equation			
4	Differentiate laminar and turbulent flow and determine various losses in pipe flow in field.			
5	Determine drag force and lift force of any hydraulic structure.			
Course Outcome	Year / Semester : II / I-Sem	**Subject Name (Code):** Strength of Materials Laboratory (A9104)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Understand the concept of deciding the shape or type of specimen for assessing different strengths against various straining actions.			
2	Can design the specimen for assessing a property of the material with the available machines.			
3	Understand the procedure for making use of various techniques of load measuring or deformation measuring instruments.			
4	Determine the behavior of structural elements, such as bars, beams Subjected to Tension, compression by means of experiments.			
Course Outcome	Year / Semester : II / I-Sem	**Subject Name (Code):** Surveying Lab – I (A9105)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 2**

After the completion of this course, the students should be able to				
1	Prepare map and plan for required site with suitable scale			
2	Measure distance and area by various surveying equipment			
3	Measure elevations, differences in elevation and plot contour maps			
4	Improve the ability to function as a member of survey group in completing the assigned field work			
Course Outcome	Year / Semester : II / II-Sem	**Subject Name (Code):** Building Materials, Construction & Planning (A9106)	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 importance of building materials and demonstrate the existence of stone and brick			
2	Describe the manufacturing of lime, cement and identify other materials suitable for building construction and Identify the suitability of timber, paints and varnishes for building works.			
3	Demonstrates the building components and other statutory requirements			
4	Describe masonry work, finishing work, construction of RCC beams and columns			
5	Adopt the relevant IS codes to be referred for various construction materials			
Course Outcome	Year / Semester : II / II-Sem	**Subject Name (Code):** Structural Analysis – I (A9107)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Demonstrates the method to analyze the member with energy theorems			
2	Illustrate the forces in cables and suspension bridges			
3	Apply the force equilibrium conditions and compatibility conditions to analyze simple			

	structures like arches and evaluate structural resultants			
4	Analyze prop cantilever and fixed beam and able to superimpose the effects of settlement or rotation of the supports over the regular analysis			
5	Analyze the continuous beam by Clapeyron's three moment theorem, slope deflection method and moment distribution method with different support conditions			
Course Outcome	Year / Semester : II /II-Sem	**Subject Name (Code):** Strength of Materials–II (A9108)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Determine slope and deflection in beams subjected to loading with different support conditions			
2	Analyze the stresses in compression members with various loading conditions and Summarize the behaviour of columns and struts under loading			
3	Apply principles of Clapeyron's and Castigliano theorem in analyzing indeterminate structures			
4	Demonstrates the behavior of unsymmetrical bending and Examine the Stresses developed at various points of the section due to unsymmetrical bending.			
5	Analyze and design thick, thin and compound cylinders subjected to pressure			
Course Outcome	Year / Semester : II / II-Sem	**Subject Name (Code):** Engineering Geology (A9109)	No. of Hours : **L: 3 T: 1 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	Year / Semester : II / II-Sem	**Subject Name (Code):** Hydraulics & Hydraulic Machinery (A9110)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Apply fundamental knowledge in solving problems and making design of open-channel hydraulics in Civil Engineering.			
2	Describe and apply dimensional analysis and similarity to develop hydraulic model sand testing.			
3	Able to distinguish the turbo-machines and their selection based on type and speed			
4	Acquire the knowledge of hydraulic machinery and their operational design in water distribution systems.			
5	Evaluate the performance centrifugal pump, design appropriate pumps with their applications and Study about problem of water hammer and cavitations phenomena.			
Course Outcome	Year / Semester : II / II-Sem	**Subject Name (Code):** Surveying Lab-II (A9111)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Measure the horizontal angles using theodolite			
2	Gain a basic understanding of the principles and operation of the working of Total Station.			
3	Prepare contour Map and Estimate the Quantity of earthwork required for formation level for Road and Railway Alignment.			
4	Appreciate the need for licensed surveyors to establish positioning information for property and structures			

VAAGDEVI COLLEGE OF ENGINEERING

Autonomous

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

Course Outcome	Year / Semester : II / II-Sem	**Subject Name (Code):** Fluid Mechanics & Hydraulic Machinery Lab (A9112)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 2**
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 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 the results of analytical models introduced in lecture to the actual behavior of real fluid flows and draw correct and sustainable conclusions.			
Course Outcome	Year / Semester : II / II-Sem	**Subject Name (Code):** Engineering Geology Lab (A9113)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 2**
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 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, unconformities.			
Course Outcome	Year / Semester : III / I-Sem	**Subject Name (Code):** Design of RC Structures (A9114)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				

1	Demonstrates the design philosophies of reinforced concrete structures and Analyze & Design singly reinforced, doubly reinforced and flanged sections			
2	Identify the behavior of reinforced concrete members in bond, anchorage, shear and torsion			
3	Design the one-way slab, two-way slab and Design structures for Serviceability			
4	Analyze and design the axially loaded, uniaxial and biaxial bending columns.			
5	Design the isolated (square, rectangular and circular)footings and stair case			
Course Outcome	Year / Semester : III / I-Sem	**Subject Name (Code):** Geotechnical Engineering (A9115)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Compute the basic properties of soils and classify the Soil according IS Soil classification system			
2	Able to determine permeability property of soils and acquires conceptual knowledge about stresses due to seepage and effective stress			
3	Demonstrates different principles in calculating stresses in soil and able to determine compaction characteristics of soil			
4	Compute and analyze the consolidation settlements			
5	Estimate shear strength parameters of different types of soils and comprehend Mohr Coulomb failure theory			
Course Outcome	Year / Semester : III / I-Sem	**Subject Name (Code):** Concrete Technology (A9116)	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 an advanced knowledge of the mechanical performance of cement based materials and demonstrate the use of various chemical admixtures and mineral additives to design cement based materials			

2	Identify Quality Control tests on aggregates used in concrete			
3	Distinguish concrete behavior based on its fresh and hardened properties.			
4	Recognize the effects of the rheology and early age properties of concrete on its long-term behavior.			
5	Illustrate proportioning of different types of concrete mixes for required fresh and hardened properties using professional codes.			
Course Outcome	Year / Semester : III / I-Sem	**Subject Name (Code):** Engineering Hydrology (A9117)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits:4**
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	Year / Semester : III / I-Sem	**Subject Name (Code):** RS &GIS (A9118)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Acquire thorough knowledge to choose the remote sensing image from different sensors, resolutions, spatial and temporal scales.			
2	Understand remote sensing which gives the provision of understanding and to comprehend large tracks of earth surface with less time and cost but more accuracy.			
3	Analyze different features of ground information to create raster or vector data			
4	Understand about Drought impact assessment and monitoring, Watershed management			

	for sustainable development and Watershed characteristics.			
5	Identification of sites for artificial Recharge structures, Drainage Morphometry			
Course Outcome	Year / Semester : III / I-Sem	**Subject Name (Code):** Environmental Impact Assessment (A9119)	No. of Hours : **L: 3 T: 1 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	Year / Semester : III/ I-Sem	**Subject Name (Code):** Structural Analysis – II (A9120)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Develop Slope Deflection equations and analyze sway & non-sway frames by Slope Deflection Method			
2	Define terms like distribution factor and carry over factor and analyze sway & non-sway frames by Moment Distribution Method.			
3	Analyze of sway & non-sway frames by Kani's method			
4	Solve multi storey frames using portal frame method, cantilever method and factor method and develop flexibility and stiffness matrix for beam, plane truss element and axially rigid framed structural			
5	Draw the influence of moving loads on the structure.			

Course	Year / Semester	**Subject Name (Code):**	No. of Hours :	**Credits: 3**

Outcome	: III/ I-Sem	Database Management Systems **(**A9511**)**	**L: 3 T: 1 P: 0**	
After the completion of this course, the students should be able to				
1	Perceive the fundamental concepts of database management.			
2	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	Apply Normalization Process to construct the database. Explain Basic Issues of transaction Processing.			
5	Compare the basic Database storage.			
Course Outcome	Year / Semester : III / I-Sem	**Subject Name (Code):** Concrete Technology Lab (A9122)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Determine the Fineness, Specific Gravity, Setting Time, Soundness and Compressive Strength of Cement			
2	Explore the various sizes and shapes of coarse aggregates used in concrete and know their importance.			
3	Identify the properties of Fresh and hardened Concrete			
4	Demonstrate ability to make selection of materials based on their properties, behavior and intended use in design and construction.			
Course Outcome	Year / Semester : III / I-Sem	**Subject Name (Code):** Structural Detailing Lab – RCC (A9123)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Illustrate the detailing of reinforcement to be provided in beams with different support conditions			

2	Understand and draw the detailing of reinforcement to be provided in one way and two slabs.			
3	Understand and draw the detailing of reinforcement to be provided columns.			
4	Understand and draw the detailing of reinforcement to be provided in footings and stair cases.			
Course Outcome	Year / Semester : III / II-Sem	**Subject Name (Code):** Environmental Science (A9014)	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 explain in related to day to day life.			
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, and OD and estimate the micro organisms which cause contamination and can propose solutions.			
Course Outcome	Year / Semester : III / II-Sem	**Subject Name (Code):** Design of Steel Structures (A9124)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Apply the knowledge of various aspects of steel construction and Demonstrates the force transferring mechanism, design and detail the connections as bolted and welded connections.			
2	Design the tension members and compression members.			
3	Design the beams for different loading cases.			
4	Design various elements of plate girders.			

5	Design roof truss members and their connections to gusset plates.			
Course Outcome	Year / Semester : III / II-Sem	**Subject Name (Code):** Irrigation Engineering (A9125)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
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 unlined and lined irrigation canals design			
3	Analyze gravity and earth dams.			
4	Plan and design diversion headworks.			
5	Express canal regulation works, canal falls, cross drainage works and outlets			
Course Outcome	Year / Semester : III / II-Sem	**Subject Name (Code):** Highway Engineering (A9126)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Express the fundamentals of highway planning and historical development of highway in India			
2	Describe the general principles that govern highway geometric design and Compute sight distance requirements and design of geometric elements, horizontal profile and vertical profile of a road			
3	Plan surveys, preparation of survey forms and data collection from field for highway design			
4	Describe different type of intersections			
5	Develop the understanding of various BIS, IRC and ISO standards and to design the highways inconformity with these codes.			
Course	Year / Semester	**Subject Name (Code):**	No. of Hours :	**Credits: 3**

Outcome	: III / II-Sem	Disaster Management (A9127)	**L: 3 T: 1 P: 0**	
After the completion of this course, the students should be able to				
1	Acquire the knowledge of disaster Management			
2	Understand the vulnerability of ecosystem and infrastructure due to a disaster			
3	Acquire the knowledge of Disaster Management Phases			
4	Understand the hazard and vulnerability profile of India			
5	Acquire the skills in post disaster management activities			
Course Outcome	Year / Semester : III / II-Sem	**Subject Name (Code):** Foundation Engineering (A9128)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the importance of soil investigation and determine various soil properties.			
2	Determine the stability of soil by finite and infinite methods			
3	Determine the earth pressures on foundations and retaining structures			
4	Calculate the bearing capacity of soils and foundation settlements			
5	Analyse the lateral stability of piles and wells			
Course Outcome	Year / Semester : III / II-Sem	**Subject Name (Code):** Elements Of Earthquake Engineering (A9129)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Appreciate the role of earthquake forces in structural design of building and various parameters related to the seismic design of buildings.			
2	Discuss and explain causes and Theories on earthquake, seismic waves, measurement of earthquakes			

4	Design and Detail the reinforcement for earth quake forces			
5	Analyze masonry buildings			
Course Outcome	Year / Semester : III / II-Sem	**Subject Name (Code):** Advanced Design Of RCC Structures (A9130)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the design and detailing Flat slab and grid slab.			
2	Understand the design and detailing different types of earth retaining walls.			
3	Understand the design and detailing different types of water retaining structures.			
4	Understand the design and detailing different types of different types of Bunker and Silos.			
5	Elaborate the design of raft or mat foundations to control the uneven settlements which occur in different pockets of soils at a particulars site			
Course Outcome	Year / Semester : III / II-Sem	**Subject Name (Code):** Structural Detailing Lab – Steel (A9131)	No. of Hours : **L: 0 T: 0 P: 3** **Total: 3**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Understand the detailing of tension, compression members and connections			
2	Understand the detailing of beam and built-up sections.			
3	Detailing of eccentric connections and web slice			
4	Understand the detailing of plate girder and roof trusses.			
Course Outcome	Year / Semester : III / I-Sem	**Subject Name (Code):** Geotechnical Engineering Lab (A9132)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 2**
After the completion of this course, the students should be able to				

1	Determine index properties of soils and classify soils			
2	Determine engineering properties of soil.			
3	Predict behaviour of soil under field loading for safe design of structures over or under the soil.			
4	Analyse and Design a variety of geotechnical engineering structures including foundations, piles, retaining walls, slopes and interpret data for different laboratory/field conditions			
Course Outcome	Year / Semester : IV / I-Sem	**Subject Name (Code):** Estimating & Costing (A9133)	No. of Hours : **L: 4 T: 0 P: 0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Understand the knowledge on methods and types of estimation and its merits and demerit			
2	Evaluate the detailed estimate of RC building			
3	Evaluate the detailed estimate of roads and irrigation works			
4	Compute the rates of different items of work from first principles.			
5	Explain Importance of contract, tender, valuation documents with construction clauses			
Course Outcome	Year / Semester : IV/ I-Sem	**Subject Name (Code):** Environmental Engineering (A9134)	No. of Hours : **L: 3 T: 1 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 waste water 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	Year / Semester : IV/ I-Sem	**Subject Name (Code):** Pre stressed Concrete (A9135)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Define pre stressed concrete, materials basic principles, stress concept, end anchorages and types of tensioning systems.			
2	Acquire the knowledge of various pre stressing techniques.			
3	Summarize the losses which occur in pre stressed members and estimation of losses			
4	Explain transfer of pre stress in pre tensioned, post tensioned members and stress distribution in End block			
5	Develop skills to satisfy the serviceability and strength provisions of the Indian Standards (IS: 1343-2012).			
Course Outcome	Year / Semester : IV/ I-Sem	**Subject Name(Code):** Ground Improvement Techniques (A9136)	No. of Hours : **L: 3 T: 1 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 soil sin-situ.			
3	Able to understand soil dewatering techniques with respect to field conditions			
4	Apply the knowledge of geo-synthetic material for usage.			
5	Apply the knowledge of modification by confinement.			
Course Outcome	Year / Semester : IV/ I-Sem	**Subject Name (Code):** Solid Waste Management	No. of Hours : **L: 3 T: 1 P: 0 Total: 4**	**Credits: 3**

		(A9137)		
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 Bio medical 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	Year / Semester : IV/ I-Sem	**Subject Name (Code):** Watershed Management (A9138)	No. of Hours : **L: 3 T: 1 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 inter relations 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 system intervention.			
5	Formulate a vision and design a sustainable watershed management plan that shows an integrated approach towards multiple use of land- and water resources and social equity and economic availability .			
Course Outcome	Year / Semester : IV/ I-Sem	**Subject Name(Code):** Transportation Engineering (A9139)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Explain railway track components, its importance and requirements.			
2	Understand the various components of airports, planning concepts and air traffic			

	controls.			
3	Elaborate on air–craft characteristics, site selection and perform corrections in runway length design.			
4	Predict the importance and necessity of harbors and docks in transportation			
5	Originate a basic understanding and appreciation of the concepts related to ITS technologies and industry applications of the field.			
Course Outcome	Year / Semester : IV/ I-Sem	**Subject Name(Code):** Bridge Engineering (A9140)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Classify bridges and loads acting on them.			
2	Design Deck slab and T-beam bridges.			
3	Design Plate Girder Bridge and Steel Truss Bridge.			
4	Design bridge bearings, piers and abutments.			
5	Apply the knowledge to inspect and maintain bridges			
Course Outcome	Year / Semester : IV/ I-Sem	**Subject Name(Code):** Rehabilitation & Retrofitting of Structures (A9141)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Demonstrates various types of distress & damages of concrete structures.			
2	Understand non-destructive testing and interpretation of the results for concrete and steel structures.			
3	Illustrate about corrosion of steel reinforcement.			
4	Suggest methods and techniques used in of repairs of Structures.			
5	Understand the Health Monitoring of Structures by Sensors.			

VAAGDEVI COLLEGE OF ENGINEERING

Autonomous

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

Course Outcome	Year / Semester : IV/ I-Sem	**Subject Name(Code):** Industrial Waste Water Treatment (A9142)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Able to minimize the Pollution.			
2	Relate different industrial wastage.			
3	Understand the operation of waste water treatment.			
4	Identify industrial waste stream characteristics from several major industrial categories and why these characteristics are important to the design of unit processes			
5	Know about Maintenance of Treatment plant.			

Course Outcome	Year / Semester : IV/ I-Sem	**Subject Name(Code):** Design & Drawing of Irrigation Structures (A9143)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Identify appropriate hydraulic structures under different conditions.			
2	Analyze, design and draw different kinds of hydraulic structures.			
3	Prepare engineering drawing and design reports			
4	Select an appropriate design for a given engineering, environmental, social and economic consideration.			
5	Understand the use of Canal Transmission Structures.			

Course Outcome	Year / Semester : IV/ I-Sem	**Subject Name(Code):** Environmental Engineering Lab (A9144)	No. of Hours: **L: 0 T: 0 P: 3**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Test water and waste water 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.			
5	Predict the quality of treated water and wastewater samples			
6	Analyze the survival conditions for the microorganism and its growth rate			
Course Outcome	Year / Semester : IV/ I-Sem	**Subject Name(Code):** Highway Engineering Lab (A9145)	No. of Hours : **L: 0 T: 0 P: 3**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Categorize aggregate used in pavements along with its suitability			
2	Identify and select the various Design strategies of pavement using Lab Equipment.			
3	Appraise on bitumen grades			
4	Evaluate stability parameters of bitumen mixes.			
5	Develop Job mix for various types of bituminous constructions such as WMM, SDBC, BC, DBM and BM etc			
Course Outcome	Year / Semester : IV/ I-Sem	**Subject Name(Code) :** Structural Drafting Lab (A9146)	No. of Hours : **L: 0T: 0 P: 3**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Use different Cad Commands to develop Plan, Section and elevation of single Storied and Multi Storied Buildings.			
2	Draw and detailing of components of different types of doors and windows.			
3	Develop Working Drawings of Residential Buildings			
4	Prepare drawing with details of roof trusses.			
5	Apply the fundaments of building systems like staircase, and other structures of importance			

VAAGDEVI COLLEGE OF ENGINEERING

Autonomous

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

Course Outcome	Year / Semester : IV/ II-Sem	**Subject Name(Code) :** Pavement Design(A9148)	No. of Hours: **L: 3 T: 1 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	Year / Semester : IV/ II-Sem	**Subject Name(Code):** Earth and Rock fill Dams (A9149)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Develop an ability to apply knowledge of geotechnical engineering to solve problems related to dams and stability.			
2	Design embankment or sloped land for economic and safe aspects for the society.			
3	Identify, formulate and solve stability related problems			
4	Compare total stress analysis versus effective Stress analysis			
5	Make Use of Bishop's pore pressure parameters			

Course Outcome	Year / Semester : IV/ II-Sem	**Subject Name(Code):** Finite Element Method (A9150)	No. of Hours : **L: 3 T: 1 P: 0 Total: 4**	**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 Outcome	Year / Semester : IV/ II-Sem	**Subject Name(Code):** Construction Technology and Project Management (A9151)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**

After the completion of this course, the students should be able to	
1	Prepare schedule of activities in a construction project
2	Make aware of various construction equipment
3	Manage a quality construction project from start to completion while maintaining budget, schedule, and safety requirements with ISO-9000
4	Prepare tender and contract document for a construction project
5	Plan project by various methods finding the time estimates and controlling the projects while deterring and flowing the critical path.

Course Outcome	Year / Semester : IV/ II-Sem	**Subject Name(Code):** Nano Technology (A9330)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**

After the completion of this course, the students should be able to	
1	Learn the components of Nano materials in detail, and its working in different applications
2	Understand the fundamentals of Nanotechnology
3	Know the different classes of nano materials
4	Impart basic knowledge on various synthesis and characterization techniques involved in Nanotechnology.

5	Understand the general scientific concepts required for technology			
6	Know scientifically the new developments in engineering and technology, and Get familiarized with the concepts, theories, and technological applications			
Course Outcome	Year / Semester : IV/ II-Sem	**Subject Name(Code):** Renewable Energy Sources (A9218)	No. of Hours : **L: 3 T: 1 P: 0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the Role and potential of renewable energy sources, solar in particular.			
2	Analyse Solar Energy Collection through different collectors Solar Energy Storage and Applications.			
3	Understand the basics of energy conversion and potential of wind energy and bio-mass.			
4	Understand the structure and principle of working of geothermal and ocean thermal energy conversion.			
5	Explore various direct energy conversion in day to day life			