VAAGDEVI COLLEGE OF ENGINEERING

Autonomous

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

COURSE OUTCOMES (Cos) - M.Tech – STRUCTURAL ENGINEERING

Course Outcome	**Year / Semester :** I / I-Sem	**Subject Name (Code):** Theory Of Elasticity And Plasticity (A920101)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Demonstrate the knowledge of fundamental methods of elasticity for 2-D Cartesian and Polar problems.			
2	Apply linear elasticity in the design and analysis of structures such as beams, plates, shells and sandwich composites.			
3	Apply principles of elastic theory to estimate 2D and 3D stresses and strains of structural engineering problems.			
4	Analyze torsional problems and appraise various theories to solve 2-D torsional problems.			
5	Understand various theories of failure and plastic behavior of structures.			
Course Outcome	**Year / Semester :** I / I-Sem	**Subject Name (Code):** Theory Of Plates (A920102)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Understand the behavior of cylindrical bending in plates			
2	Analyze plates under different boundary connections by various classical methods, special and approximate methods			
3	Perform cylindrical bending of long rectangular plates, pure bending of rectangular and circular plates, and small deflection theories for various boundary conditions.			
4	Understand the behavior of orthotropic plates, grids and folded plates.			

5	Understand the behavior of buckling of plates and Formulate Finite Difference Equations for solution of the structural response of plate bending problems			
Course Outcome	**Year / Semester :** I / I-Sem	**Subject Name (Code):** Advanced Structural Analysis (A920103)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Summarize static and kinetic indeterminacy in analysis of structures			
2	Perform analysis by iteration method and determine deflection of structures using matrix methods.			
3	Analyze the structure with flexibility method			
4	Analyze the structure with stiffness method			
5	Demonstrate the necessity of shear wall and analysis of shear wall			
Course Outcome	**Year / Semester :** I / I-Sem	**Subject Name (Code):** Advanced Concrete Technology (A920104)	No. of Hours : **L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
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 Make use of various chemical admixtures and mineral additives to design cement based materials.			
2	Use advanced laboratory techniques to characterize cement-based materials and determine the properties of concrete ingredients i.e. cement, sand, coarse aggregate by conducting different tests.			
3	Learn transition zone in concrete, measurement of workability, properties of concrete, rheological behavior of concrete, economic concrete mix design.			
4	Understand the mix design and engineering properties of special concretes such as high- performance concrete, self-compacting concrete, fibre reinforced			

	concrete, etc.			
5	Understand the safety steps involved in the design of form work and false work			
Course Outcome	**Year / Semester :** I / I-Sem	**Subject Name (Code):** Tall Buildings (A920105)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Demonstrate design philosophy & loading on tall structures and Study the behavior of different types of tall structural systems			
2	Analyze tall structures for vertical and lateral loads with various methods and approaches			
3	Understand approximate analysis, accurate analysis and reduction techniques			
4	Familiar with design of structural elements, buckling analysis			
5	Analyse and design high rise structures with modern methods and demonstration of various software			
Course Outcome	**Year / Semester :** I / I-Sem	Subject Name (Code): Advanced Foundation Engineering (A920106)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Develop an understanding to perform site investigations and Determine the soil parameters needed to carry out foundation design.			
2	Calculate the bearing capacity of soils and effect of compressibility on shallow foundation			
3	Understand the behaviour of settlement in shallow foundation			
4	Do pile capacity (static, dynamic, lateral and group capacity) analysis as per code			
5	Understand the complete physics of pile and pile group failure mode under various circumstances and Select appropriate pile system based on the soil conditions (i.e., expansive or collapsible soil)			

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Course Outcome	**Year / Semester :** I / I-Sem	**Subject Name (Code):** Advanced Reinforced Concrete Design (A920107)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Demonstrate the behaviour of RCC beams and Ensure serviceability criteria for reinforced concrete structural elements.			
2	Understand the concept of Yield line theory			
3	Analyze and design of Ribbed Slab and flat slab			
4	Analyze and design of Concrete Deep beams and Corbels			
5	Design of short column under axial, uni axial and bi axial bending and slender columns and combine footing			
Course Outcome	**Year / Semester :** I / I-Sem	**Subject Name (Code):** Bridge Engineering (A920108)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Develop an understanding of and appreciation for basic concepts in proportioning and design of bridges in terms of aesthetics, geographical location			
2	Analyze and design of solid slab bridges			
3	Understand the design methods of girder bridges			
4	Familiar with various types of bridges such as slab-bridge, T-beam bridge, pre-stressed concrete bridge, continuous bridge, arch bridge, box girder bridge decks			
5	Design and check the stability of piers and abutments			
Course Outcome	**Year / Semester :** I / I-Sem	**Subject Name (Code):** Plastic Analysis And Design (A920109)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				

1	Demonstrates different methods of analysis for plastic moment and recognize the difference between elastic and plastic behavior of structural members.
2	Design of continuous beams with different cross sections
3	Demonstrates the behavior of axial force on plastic moment sections
4	Design of interior connections
5	Design of steel frames and determine deflection in beams and sinhole frames

Course Outcome	**Year / Semester :** **I / I-Sem**	**Subject Name (Code):** Advanced Concrete Laboratory (A920113)	**No. of Hours : L: 0 T: 0 P: 4 Total: 4**	**Credits: 2**
After the completion of this course, the students should be able to				
1	Test Fineness, Specific Gravity, Setting Time, Soundness and Compressive Strength of Cement			
2	Test physical properties of Coarse Aggregate and Fine Aggregate			
3	Test Workability of Fresh Concrete and Compressive strength, Split Tensile Strength of Hardened Concrete			
4	Demonstrate ability to make selection of materials based on their properties, behaviour and intended use in design and construction			
Course Outcome	**Year / Semester :** I / II-Sem	Subject Name (Code): Finite Element Method (A920201)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Understand the fundamental concepts of the Finite Element Method (FEM).			
2	Able to understand the concepts of one and two dimensional FEM			

3	Identify Isoparametric formulation and axi symmetric analyais.			
4	Analysis the quadrilateral plate element and shell element			
5	Learn and apply non linear analysis and application in special structures.			
Course Outcome	**Year / Semester :** I / II-Sem	**Subject Name (Code):** Structural Dynamics (A920202)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Know about the theory of vibrations and definitions used in structural dynamics.			
2	Understand the fundamentals of structural dynamics and Single Degree of Freedom.			
3	Understand about the Multi Degree of Freedom system and its responses.			
4	Apply practical vibration analysis and continuous systems in beams.			
5	Know the codal methods of analysis for response of multi storeyed buildings.			
Course Outcome	**Year / Semester :** I / II-Sem	**Subject Name (Code):** Pre-Stressed Concrete (A920203)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Understand about principles and losses of prestress in prestressed concrete.			
2	Design beams section for flexure and shear.			
3	Find long term and short term deflection of prestressed concrete beams.			
4	Determine the stresses in post tensioned members and stress distribution.			
5	Analyze the Continuous beams and simple portal frames..			

Course Outcome	**Year / Semester :** I / II-Sem	**Subject Name (Code):** Advanced Steel Design (A920204)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**

After the completion of this course, the students should be able to				
1	Know about the Riveted , Bolted and welded connections.			
2	Understand analyze the beams and column connections			
3	Analyze and design different components in the industrial building			
4	Design the compression and tension members of a steel truss girder bridges.			
5	Design and detail of Bunker and Silos.			
Course Outcome	**Year / Semester :** I / II-Sem	**Subject Name (Code):** Soil Dynamics and Foundation Engineering (A920205)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Demonstrates the types of machine foundation and is effects.			
2	Determination of behaviour of natural frequency of foundation by I.S method			
3	Know about the elastic properties of soil for dynamic purpose			
4	Know the various solution and equation for the design of foundation.			
5	Design the foundation for reciprocating and impact type of machine.			
Course Outcome	**Year / Semester :** I / II-Sem	**Subject Name (Code):** Stability of Structures (A920206)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Find out the differential equation for beam columns and its effect on deflection,			
2	Get knowledge about elastic buckling of bars and frames.			
3	Elaborate the experiments, formulae for elastic and inelastic lateral buckling.			

4	Analyse thin walled bars and buckling by torsion and flexure.			
5	Determine the lateral buckling of simply supported beams.			
Course Outcome	**Year / Semester :** I / II-Sem	**Subject Name (Code):** Design of Shells and Folded Plates (A920207)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Understand the equilibrium theories for analysis of shell structures			
2	Derive the governing equation for bending theory of cylindrical shells.			
3	Get knowledge about shells of double curvatures.			
4	Impart Knowledge on the analysis of Axi – symmetrical shells and its application.			
5	Analyze the folded plates by whitney's method and Simpsons method.			
Course Outcome	**Year / Semester :** I / II-Sem	Subject Name (Code): Earthquake Resistant Design of Buildings (A920208)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Understand the engineering seismology and its fundamental definition.			
2	Analyze the seismic design requirements in earthquake resistant building.			
3	Determine the design lateral forces in Reinforced Concrete buildings.			
4	Analyze the effects of structural and non – structural elements.			
5	Know about ductility consideration in RC Buildings and capacity based design.			
Course Outcome	**Year / Semester :** I / II-Sem	**Subject Name (Code):** Fracture Mechanics (A920209)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				

1	Know the fundamental concepts of fracture mechanics of concrete.			
2	Understand design based linear elastic fracture mechanics.			
3	Find the principles involved in non linear elastic materials.			
4	Get knowledge about the fracture mechanics of the concrete.			
5	Enable the fracture behaviour of different materials.			
Course Outcome	**Year / Semester :** I / II-Sem	**Subject Name (Code):** Repair & Rehabilitation Of Buildings (A920210)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Learn about deterioration of structures, various distress and damages in concrete.			
2	Know the overview of structural health monitoring and Non destructive testing.			
3	Understand maintenance and repair strategies in damaged structures.			
4	Get an idea of repair techniques and understand the proerties of repair materials.			
5	Describe classification and retrofitting strategies for RC buildings.			
Course Outcome	**Year / Semester :** I / II-Sem	**Subject Name (Code):** Composite Materials (A920211)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
1	Learn requirements of structural materials in structural form.			
2	Determine the mechanical properties of composite laminae.			
3	Understand the behavior of glass fiber reinforced laminates and itsfailure criteria.			
4	Analyse the long term strength and stiffness properties in structural design.			
5	Design GRP box beams and stressed skinned roof structures.			
Course Outcome	**Year / Semester :**	**Subject Name (Code):** Optimization	**No. of Hours : L: 4 T: 0 P: 0**	**Credits: 4**

	I / II-Sem	Techniques (A920212)	**Total: 4**	
1	Know the overview and importance of optimization techniques.			
2	Understand about the linear and non – linear programming methods.			
3	Know the principles involved in continuous dynamic programming mthods.			
4	Analysis the network capacity problems and its types.			
5	Determine optimization techniques in trusses, beams and frames.			
Course Outcome	**Year / Semester :** I / II-Sem	**Subject Name (Code):** CAD Lab (A920213)	**No. of Hours : L: 4 T: 0 P: 0 Total: 4**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Write program blocks in Excel			
2	Pre-process the structural elements/structures using STAAD Pro.			
3	Analyse the structural elements/structures.			
4	Arrive at C programs to solve problems using numerical techniques.			