Annamacharya Institute of Technology and Sciences, Tirupati
(Autonomous)

AK19 REGULATION COURSE OUTCOMES FOR STRUCTURAL ENGINEERING

COURSE NAME	CO	COURSE OUTCOMES
Matrix Methods of Structural Analysis (19DPC0101)	CO1	Understand the basic concepts of structural analysis.
	CO2	Apply numerical methods to solve continuum beams.
	CO3	Analysis of two dimensional portal frames using different methods.
	CO4	Understand the basic concepts of transformation of matrices from local to global coordinates.
	CO5	Solve the equations using different solution techniques
ADVANCED SOLID MECHANICS (19DPC0102)	CO1	Understanding the basic concepts, Cartesian Tensors and Equations of Elasticity.
	CO2	Apply numerical methods to solve continuum problems.
	CO3	Solve simple problems of elasticity and plasticity understanding the basic concepts.
	CO4	Solve simple problems Two-Dimensional Problems of Elasticity and torsion
	CO5	Understand Plastic Stress-Strain Relations, Principle of Normality and Plastic Potential
STRUCTURAL OPTIMIZATION (19DPC0101)	CO1	To study the different optimization methodologies applied to structural systems.
ADVANCED CONCRETE MATERIALS AND TECHNOLOGY (19DPE0102)	CO1	Understand various ingredients of concrete and their role.
	CO2	Examine knowledge on the fresh and hardened properties of concrete.
	CO3	Design concrete mixes using various methods.
	CO4	Perceive special concretes for accomplishing performance levels.
	CO5	Understand the durability of concrete and remedial methods.
STABILITY OF STRUCTURES (19DPE0103)	CO1	Understand the difference between stability and instability of the structures
	CO2	Determine stability of columns
	CO3	Able to determine the buckling loads for columns
	CO4	Able to apply advanced numerical techniques to buckling analysis of structures.
	CO5	Determine stability of beams
ANALYTICAL AND NUMERICAL METHODS FOR STRUCTURAL ENGINEERING (19DPE0104)	CO1	Analyze the concept of Linear equations.
	CO2	Understand the concept of Calculus of Variation.
	CO3	Understand the concept of Calculus of Variation.
	CO4	Analyze the concept of basic methods of P.D.E .
	CO5	Analyze the concept of basic methods of P.D.E .
ENERGY EFFICIENT BUILDINGS (19DPE0105)	CO1	This course aims to provide an understanding of the concept of reduction in energy consumption through low energy building design.
	CO2	Highlight strategies to integrate day lighting and low energy heating/cooling in buildings.

	CO3	Understand the concept and theoretical background of low energy building design.
	CO4	Apply simulation tools to achieve energy efficiency in buildings.
	CO5	Understand importance of energy consumption.
THEORY OF THIN PLATES AND SHELLS (19DPE0106)	CO1	Use analytical methods for the solution of thin plates and shells.
	CO2	Use analytical methods for the solution of shells.
	CO3	Apply the numerical techniques and tools for the complex problems in thin plates.
	CO4	Apply the numerical techniques and tools for the complex problems in shells.
	CO5	Application to Pipes and Pressure Vessels.
RESEARCH METHODOLOGY AND IPR (19DML0101)	CO1	To acquaint with basics of research problem formulation
	CO2	Familiar with research related information and ethics.
	CO3	Aware about research report writing and presentation.
	CO4	Understand and get knowledge of basic rights for protection of innovatives.
	CO5	Understand different types of IPRs
UNDERSTAND DIFFERENT TYPES OF IPRS (19DMC9901)	CO1	Understand that how to improve your writing skills and level of readability
	CO2	Learn about what to write in each section
	CO3	Understand the skills needed when writing a Title
	CO4	Develop writing skill
	CO5	Able to quote phrases
DISASTER MANAGEMENT (19DMC0101)	CO1	Learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.
	CO2	Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.
	CO3	Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.
	CO4	Critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work in
SANSKRIT FOR TECHNICAL KNOWLEDGE (19DMC9902)	CO1	To get a working knowledge in illustrious Sanskrit, the scientific language in the world
	CO2	Learning of Sanskrit to improve brain functioning
	CO3	Understanding basic Sanskrit language
	CO4	Ancient Sanskrit literature about science & technology can be understood
	CO5	Being a logical language will help to develop logic in students
VALUE EDUCATION (19DMC9903)	CO1	Understand value of education and self- development
	CO2	Imbibe good values in students
	CO3	Let the should know about the importance of character
	CO4	Learn the importance of Human values

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	CO5	Developing the overall personality
STRUCTURAL DESIGN LAB-I (19DPC0103)	CO1	Design and Detail of simple beams
	CO2	Design and Detail of simple frames and Truss
	CO3	Design and Detail complete all the Structural Components of Frame Buildings.
	CO4	Design and Detail complete Multi-Storey Frame Buildings.
	CO5	Analyze a Tall building for wind force
ADVANCED CONCRETE LAB (19DPC0104)	CO1	Conduct tests on Concrete ingredients.
	CO2	Understand the mix design of concrete as per Codal Specification
	CO3	Conduct tests on workability and hardened concrete
	CO4	Develop stress strain curve on concrete
	CO5	Establish the correlation between different strengths of concrete
	CO6	Conduct NDT tests on concrete members.
	CO7	Understand the Mix design of special concretes.
	CO8	Understand concepts of durability
	CO9	Understand the concept of corrosion and its effect on concrete
FEM IN STRUCTURAL ENGINEERING (19DPC2005)	CO1	Analyze finite element method efficiently in order to solve field problems
	CO2	Understand the basic concepts of 1D Dimensional elements
	CO3	Understand the basic concepts of 2D Dimensional elements
	CO4	Analyze 4-Noded And 8-Noded Isoparametric elements
	CO5	Understand the concepts of 3-D Elements
STRUCTURAL DYNAMICS (19DPC2006)	CO1	Understand the concept of dynamic loads and vibrations
	CO2	Analyze and study dynamics response of single degree freedom system using fundamentalTheory and equation of motion.
	CO3	Analyze and study dynamics response of Multi degree freedom system using fundamental theory and equation of motion.
	CO4	Use the Approximate Methods for dynamic analysis
	CO5	Analyze earthquake loads acting on structure.
DESIGN OF ADVANCED CONCRETE STRUCTURES (19DPE2007)	CO1	Analyze the deflections of Reinforced Concrete Beams And Slabs by understanding their behaviour.
	CO2	Analyze and Design the Deep Beams by understanding their behaviour.
	CO3	Analyze and Design the Flat Slabs by understanding their behaviour.
	CO4	Analyze and Design the Shear Walls by understanding their behaviour.
	CO5	Analyze and Design the concrete members for Fire Resistance
ADVANCED STEEL DESIGN (19DPE2008)	CO1	Use Design steel structures/ components by different design processes.
	CO2	Analyze and design beams for stability and strength, and drift.
	CO3	Determine the stability of column and strength
	CO4	Understand the method of design criteria
	CO5	Design welded and bolted connections.

DESIGN OF HIGH-RISE STRUCTURES (19DPE2009)	CO1	Analyse, design and detail Transmission/ TV tower, Mast and Trestles with different loading conditions
	CO2	Analyse, design and detail the RC Chimney
	CO3	Analyse, design and detail Steel Chimney.
	CO4	Analyse. design and detail the tall buildings subjected to different loading conditions using relevant codes.
	CO5	Analysis and Design by using software application
DESIGN OF PRE-STRESSED CONCRETE STRUCTURES (19DPC2010)	CO1	Understand the basic aspects of prestressed concrete fundamentals, including pre and posttensioning processes.
	CO2	Find out losses in the prestressed concrete.
	CO3	Analysis and design of prestressed concrete sections for flexure
	CO4	Analyze and design for shear and end blocks in prestressed concrete.
	CO5	Analysis of Statically Indeterminate Structures
DESIGN OF BRIDGES (19DPC2011)	CO1	Understand the basic aspects of Bridges
	CO2	Able to design Box Culvert and Slab Deck bridge
	CO3	Able to design T Beam bridge and Longitudinal Girder
	CO4	Able to design Prestressed Concrete Bridges
	CO5	Analysis of Piers and Abutments
ADVANCED DESIGN OF FOUNDATIONS (19DPE2012)	CO1	Decide the suitability of soil strata for different projects.
	CO2	Design shallow foundations deciding the bearing capacity of soil.
	CO3	Analyze and design the pile and well foundation.
	CO4	Understand analysis methods for tunnel and open cuts.
	CO5	Understand analysis methods for coffer dams
CONSTITUTION OF INDIA (19DMC9904)	CO1	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
	CO2	Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
	CO3	Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.
	CO4	Discuss the passage of the Hindu Code Bill of 1956.
	CO5	Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
PEDAGOGY STUDIES (19DMC5801)	CO1	What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?
	CO2	What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?
	CO3	How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? Perspective.
	CO4	Review existing evidence on the review topic to inform programme design and policy making undertaken by the DfID, other agencies and researchers.

	CO5	Identify critical evidence gaps to guide the development.
Stress Management by Yoga (19DMC9905)	CO1	Develop healthy mind in a healthy body thus improving social health also
	CO2	Improve efficiency
	CO3	To achieve overall health of body and mind
	CO4	To overcome stress
	CO5	Identify critical evidence gaps to guide the development.
Personality Development through Life Enlightenment Skills (19DMC9906)	CO1	
	CO2	The person who has studied Geeta will lead the nation and mankind to peace and prosperity
	CO3	Study of Neetishatakam will help in developing versatile personality of students.
	CO4	To become a person with stable mind, pleasing personality and determination
	CO5	To awaken wisdom in students
Structural Design Lab-II (19DPC2007)	CO1	Design and Detail of Prestressed Concrete members
	CO2	Design and Detail of Water Tanks
	CO3	Design and Detail of bridge girder and cylindrical shell
	CO4	Determine the Dynamic of tall building.
	CO5	Design and Detailing of different foundations.
FEM Laboratory (19DPC2008)	CO1	Identify mathematical model for solution of common engineering problems
	CO2	Understand the concept of meshing for rectangular and circular plates
	CO3	Analyze the bar elements and truss elements using FEM software
	CO4	Analyze the 2D Frame and 3D frame using FEM software
Earthquake Resistant Design (19DPE2013)	CO1	To study the basic concepts of engineering seismology, strength and capacity design principles of earthquake resistant design.
	CO2	To study the behavior of various types of buildings under static and dynamic forces subjected to earthquakes.
	CO3	Learn the basic concepts of earthquake engineering and principles of earthquake resistant design.
	CO4	Analyze and design the various types of structures under static and dynamic loading conditions.
	CO5	Understand different vibration techniques.
Structural Health Monitoring (19DPE2014)	CO1	Select amongst various types of Structural health monitoring techniques
	CO2	Perform Static field testing's
	CO3	Perform Dynamic field testing's
	CO4	Perform Non destructive evaluation
	CO5	Select Software and Hardware required for remote health monitoring of Structures
Design of Industrial Structures (19DPE2015)	CO1	Design Steel Gantry Girders
	CO2	Design Steel Portal, Gable Frames.
	CO3	Design Steel Bunkers
	CO4	Design Silos.

	CO5	Design Chimneys and Water Tanks.
Waste to Energy(19DOE2001)	CO1	Able to classify types of wastes
	CO2	Understand the method of pyrolysis
	CO3	Understand the use and application of Biomass gasifiers
	CO4	Design biomass combustors
	CO5	Analyze the properties of Biogas
Project Management (19DOE2002)	CO1	Able to understand the importance of construction project management, organization and leadership capabilities
	CO2	Able to apply theoretical and practical aspects of project management planning techniques to achieve project goals.
	CO3	Possess ideas on contract, tender and arbitration in construction projects.
	CO4	Understand to apply knowledge and skills of quality and safety management in construction.
	CO5	Have necessary knowledge in resource planning, costing and accounting.
Industrial Safety (19DOE9001)	CO1	Analyze the basics of industrial safety.
	CO2	Understand the Fundamentals of maintenance engineering
	CO3	Apply the methods of prevention of corrosion and wear.
	CO4	Understand the Fault tracing and their applications.
	CO5	Understand the methods of preventive measures and maintenance
Operations Research (19DOE9002)	CO1	Understand the characteristics and phases, types of models, allocation in linear programming
	CO2	Apply the concept of optimal solution, unbalanced problem, degeneracy and Transportation problem & sequencing.
	CO3	Understand the concept of replacement of items and related problems, theory of games related problems
	CO4	Apply the concept of the knowledge of queuing models, inventory management models.
	CO5	Apply the knowledge of dynamic programming, the concept of the simulation and simulation languages.
Composite Materials (19DOE9004)	CO1	Understanding of basic concepts and charactestics of geometric and physical applications of composites
	CO2	Explain different reinforcements and their properties.
	CO3	Study of micromechanics and properties of composite material
	CO4	Study of coordinate transformations of stress and strain laws
	CO5	Study of elastic behaviour of unidirectional composites; Joining Methods and Failure