Annamacharya Institute of Technology and Sciences, Tirupati (Autonomous)

AK25 REGULATION M.TECH – STRUCTURAL ENGINEERING

COURSE OUTCOMES

Subject Name	ADVANCED STRUCTURAL ANALYSIS
Subject Code	25DPC2001
COURSE OUTCOMES	
CO1	Apply matrix method fundamentals and element equation formulation for trusses, beams, and torsion.
CO2	Apply the direct stiffness method to assemble the global stiffness matrix
CO3	Analyze trusses, continuous beams and plane frames using
CO4	Analyze trusses, continuous beams and plane frames using the stiffness method
CO5	Apply special analysis procedures to find structural response quantities

Subject Name	THEORY OF ELASTICITY
Subject Code	25DPC2002
COURSE OUTCOMES	
CO1	Apply the fundamental concepts of plane stress and plane strain analysis
CO2	Apply two-dimensional stress and strain analysis methods in rectangular coordinates
CO3	Analyze two-dimensional problems in polar coordinates to determine stress and strain distributions
CO4	Apply the three-dimensional stress and strain systems
CO5	Analyze torsional behavior of prismatic bars with different cross-sections

Subject Name	FRACTURE MECHANICS
Subject Code	25DPE2001
COURSE OUTCOMES	
CO1	Apply the basic problems and concepts of fracture mechanics
CO2	Analyse the elastic crack-tip stress fields using Airy stress function and complex stress functions
CO3	Apply different approaches to determine the shape and effect of the plastic zone under plane stress and plane strain conditions.
CO4	Apply the energy-based principles of crack growth using standard testing methods
CO5	Apply the fracture assessment methods to determine stress intensity factors

Subject Name	ADVANCED CONCRETE TECHNOLOGY
Subject Code	25DPE2002
COURSE OUTCOMES	
CO1	Understand the properties and types of cements and aggregates used in concrete
CO2	Understand the fresh and hardened properties of concrete
CO3	Design concrete mix as per IS, ACI codes for economical, durable concrete and also understand types, properties and applications of special concretes
CO4	Understand the engineering properties and special applications of concrete.
CO5	Understand the engineering properties and special applications of concrete.

Subject Name	ADVANCED MATHEMATICAL METHODS
Subject Code	25DPE2003

COURSE OUTCOMES	
CO1	Analyze the solutions of various functionals in Calculus of variation
CO2	Apply the numerical methods for solving ordinary differential equations to find eigen values and eigen vectors
CO3	Apply the numerical techniques to solve elliptical equations models of partial differential equations
CO4	Apply the numerical techniques to solve parabolic equations models of partial differential equations
CO5	Analyze the concepts of finite element methods for 1-D and 2-D problems

Subject Name	**Advanced Reinforced Concrete Design**
Subject Code	**25DPE2004**
COURSE OUTCOMES	
CO1	Analyse the deflections of Reinforced Concrete Beams and Slabs by understanding their behaviour.
CO2	Design the Deep Beams and estimation of crack width in concrete structures
CO3	Design the Flat Slabs according to ACI standards
CO4	Design the plain concrete and shear wall according to loading conditions
CO5	Analyse the effects of high temperatures on reinforced concrete members under fire

Subject Name	**EXPERIMENTAL STRESS ANALYSIS**
Subject Code	**25DPE2005**
COURSE OUTCOMES	
CO1	Understand the principles, merits and applications of experimental stress analysis and differentiate various methods for simplifying structural problems.
CO2	Apply the concepts of strain measurement using different types of strain gauges
CO3	Analyse strain data using strain rosettes through non-destructive testing methods
CO4	Understand the theory of photoelasticity, stress-optic law, polariscope arrangements, and fringe sharpening techniques.
CO5	Apply two-dimensional photoelasticity techniques to interpret fringe patterns

Subject Name	**PRECAST AND PREFABRICATED STRUCTURES**
Subject Code	**25DPE2006**
COURSE OUTCOMES	
CO1	Understand the principles and methods of prefabrication
CO2	Analyse the behaviour and design of prefabricated load-carrying members
CO3	Apply knowledge of structural and non-structural joints for precast elements
CO4	Understand production and hoisting technologies for precast components
CO5	Design precast units for buildings and industrial structures for progressive collapse and abnormal load conditions

Subject Name	**ADVANCED CONCRETE LABORATORY**
Subject Code	**25DPC2003**
COURSE OUTCOMES	
CO1	Evaluate the fresh and Hardened concrete properties for different grades of conventional concrete
CO2	Evaluate the fresh and hardened concrete properties for high strength grades of

	concrete
CO3	Evaluate the fresh and hardened properties of self compacting concrete
CO4	Analyze the admixtures effect on fresh properties of concrete
CO5	Evaluate the quality aspects of specimen by NDT methods

Subject Name	**Computer Aided Design Laboratory**
Subject Code	**25DPC2004**
COURSE OUTCOMES	
CO1	Design the determinate and indeterminate beams using Excel templates.
CO2	Design of one-way and two-way slabs, plane and space frames under various loading conditions.
CO3	Design of multi-storeyed buildings under various loading conditions.
CO4	Design of roof trusses, rectangular and circular water tanks, and foundations using spreadsheet-based calculations.
CO5	Design of different types of staircases with accurate consideration of loads and geometry.

Subject Name	**Research Methodology and Intellectual Property Rights**
Subject Code	**25MBA0110**
COURSE OUTCOMES	
CO1	Understand various research approaches for different research goals to identify suitable methodologies.
CO2	Analyse various sources and tools and technologies to collect the data.
CO3	Apply statistical methods for analysing data and understand the guidelines for report writing.
CO4	Analyse the safeguarding of business secrets by using various types of Intellectual Property Rights
CO5	Understand the procedure for filling and grant of patent to protect the innovative ideas of the business.

Subject Name	**ARTIFICIAL INTELLIGENCE AND APPLICATIONS IN CIVIL ENGINEERING**
Subject Code	**25DSC2001**
COURSE OUTCOMES	
CO1	Understand the concepts, history and branches of Artificial Intelligence with relevance to civil engineering applications.
CO2	Apply machine learning models and algorithms to solve civil engineering problems.
CO3	Apply artificial neural network and deep learning models for infrastructure and structural engineering applications
CO4	Understand fuzzy logic and expert systems to handle uncertainty in engineering decision-making
CO5	Understand prompt engineering techniques to effectively use AI tools in civil engineering

Subject Name	**ENGLISH FOR RESEARCH PAPER WRITING**
Subject Code	**25DMC2001**
COURSE OUTCOMES	
CO1	Understand the key language aspects and structural elements of academic

	writing in research papers.
CO2	Analyze research articles and identify the strengths and limitations of different methodologies.
CO3	Apply critical reading strategies and advanced grammar skills to analyze and write research papers.
CO4	Evaluate research papers to check for plagiarism, structure, clarity, and language accuracy and develop a well-structured research paper that effectively communicates complex ideas.
CO5	Evaluate the effectiveness of different language and technology tools in research writing, including AI-assisted tools and plagiarism detection software.

Subject Name	**DISASTER MANAGEMENT**
Subject Code	**25DMC2001**
COURSE OUTCOMES	
CO1	understand hazards and disasters, their classifications based on type and nature and their impacts on people
CO2	Understand map disaster-prone areas in India and epidemiological consequences of disasters.
CO3	Understand disaster preparedness through monitoring and risk evaluation
CO4	Understand disaster risk, its reduction, assessment techniques, global cooperation and survival strategies
CO5	Understand disaster mitigation concepts, strategies, trends and related programs in India