



**BANSAL INSTITUTE OF RESEARCH & TECHNOLOGY,
BHOPAL**

Kokta Anand Nagar, Bhopal



DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOMES (COs)

Semester: IV

Course Name: Energy & Environmental engineering		Course Code: ES-401
Students will be able to:		
CO1:	Understand different energy systems and distinguish between renewable and non-renewable energy resources along with their applications.	
CO2:	Explain the structure, functions, and components of ecosystems and their importance in maintaining ecological balance.	
CO3:	Understand the concept of biodiversity and explain the methods and importance of its conservation.	
CO4:	Identify the sources, impacts, and control measures of environmental pollution to promote sustainable environmental management.	
CO5:	Understand the principles of environmental ethics and explain the role of environmental laws and the Environmental Protection Act in conserving the environment.	

Course Name: Construction Technology		Course Code: CE-402
Students will be able to:		
CO1:	Understand the design, construction, and functional requirements of various building components used in civil engineering projects.	
CO2:	Explain the principles and applications of temporary structures and formwork systems used during construction activities.	
CO3:	Identify and describe the construction methods of building components such as foundations, masonry, floors, roofs, doors, and windows.	
CO4:	Apply modern construction techniques and technologies in the execution of major and minor civil engineering works.	
CO5:	Understand the principles of earthquake-resistant construction and analyze the planning, design, and structural elements required for safe and durable buildings.	



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Course Name: Structural Analysis-I		Course Code: CE-403
Students will be able to:		
CO1:	Apply the principles of virtual work and strain energy to analyze the behavior and deformation of structural members.	
CO2:	Analyze fixed and continuous beams using the Three-Moment Theorem and Moment Distribution Method.	
CO3:	Determine the forces and moments in indeterminate beams and frames using the Slope Deflection Method and Column Analogy Method.	
CO4:	Understand the behavior and structural analysis of two-hinged and three-hinged arches under different loading conditions.	
CO5:	Evaluate shear force and bending moment due to rolling loads by applying influence line diagrams, equivalent uniformly distributed loads (EUDL), and related concepts for determinate structures.	

Course Name: Transportation Engg. - I		Course Code: CE-404
Students will be able to:		
CO1:	Understand the different modes of transportation and explain the components and functions of railway tracks and permanent way.	
CO2:	Apply the principles of railway geometric design for safe, efficient, and economical railway alignment.	
CO3:	Understand the planning, investigation, and structural components of bridges used in transportation engineering.	
CO4:	Explain the types and functions of bridge foundations and select suitable foundation systems based on site conditions.	
CO5:	Understand the components of tunnels and describe the various methods used for tunnel construction in civil engineering projects.	



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Course Name: Engineering Geology & Remote Sensing		Course Code: CE-405
Students will be able to:		
CO1:	Understand the basic principles of engineering geology and explain their significance in civil engineering projects.	
CO2:	Identify and interpret geological features and structures and evaluate their influence on the planning and construction of engineering works.	
CO3:	Classify minerals and rocks and explain their formation, properties, engineering characteristics, and practical applications.	
CO4:	Differentiate between various geological structures such as folds, faults, and joints, and assess their impact on civil engineering design and construction.	
CO5:	Understand geological investigation techniques and apply them for the planning, design, and construction of dams, tunnels, reservoirs, and other civil engineering structures.	

**Approved By: -
Head of Department**