BANSAL INSTITUTE OF RESEARCH & TECHNOLOGY, BHOPAL
Kokta Anand Nagar, Bhopal

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING -DATA SCIENCE

COURSE OUTCOMES (COs)

Semester: III

Course Name: Technical Communication		**Course Code: CD 301**
Students will be able to:		
CO1:	Understand and apply the fundamental theories of verbal and non-verbal communication in professional environments.	
CO2:	Enhance career-building skills, including resume drafting, corporate dressing, and job interview preparedness.	
CO3:	Draft, design, and deliver effective professional presentations with a keen awareness of target audiences.	
CO4:	Develop leadership and interpersonal skills required for group discussions and collaborative workplace scenarios.	
CO5:	Master digital communication tools and exhibit advanced linguistic ability, accurate grammar, and proper voice dynamics	

Course Name: Introduction to Probability and Statistics		**Course Code: CD 302**
Students will be able to:		
CO1:	Understand and apply basic concepts of probability, including probability spaces, conditional probability, Bayes' rule, and characteristics of discrete and continuous random variables	
CO2:	Evaluate and interpret standard probability distributions (e.g., Binomial, Poisson, Normal, Exponential, Gamma) to model real-world engineering and traffic network scenarios.	
CO3:	Analyze data using descriptive statistics, correlation, and regression models to make objective, data-driven decisions.	
CO4:	Apply the method of least squares for curve fitting and evaluate large sample statistics using tests of significance	
CO5:	Conduct hypothesis testing and interpret analytical results for small samples using tests of variance, means, and attribute independence.	

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Course Name : Data Structures	**Course Code: CD 303**
Students will be able to:	
CO1:	Understand the fundamental concepts of dynamic memory management, data types, and algorithm complexity (Big O notation)
CO2:	Implement and manipulate linear data structures like arrays, linked lists, stacks, and queues to organize data.
CO3:	Apply non-linear data structures—including trees (BST, AVL, heaps) and graphs—to complex problem-solving scenarios
CO4:	Select and implement efficient searching and sorting algorithms (e.g., Quick sort, Merge sort) for specific computational problems
CO5:	Demonstrate the ability to evaluate and optimize data structures for real-world engineering applications

Course Name : Database Management Systems	**Course Code: CD 304**
Students will be able to:	
CO1:	Compare DBMS and traditional file systems, explaining the fundamental need for and architecture of Database Management Systems.
CO2:	Model enterprise data using Entity-Relationship (ER) diagrams and analyze physical/logical database designs
CO3:	Formulate complex data retrieval queries using SQL, Relational Algebra, and Relational Calculus.
CO4:	Apply normalization theory (1NF, 2NF, 3NF, BCNF) to eliminate redundancy and design an optimal database schema.
CO5:	Summarize transaction processing concepts, concurrency control protocols, and recovery algorithms.

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Course Name: Object Oriented Programming & Methodology	**Course Code: CD 305**
Students will be able to:	
CO1:	Understand and distinguish the core differences between procedural and object-oriented programming paradigms.
CO2:	Implement real-world entities into classes and objects by utilizing access modifiers, constructors, and destructors
CO3:	Design robust programs using relationships like inheritance, association, and aggregation to achieve code reusability
CO4:	Apply static and dynamic polymorphism through method overloading and overriding
CO5:	Handle exceptional conditions, manage data collections, and implement multithreading to build concurrent applications.

Course Name: Computer Workshop/Introduction to Python-I	**Course Code: CD 306**
Students will be able to:	
CO1:	Understand the fundamental concepts of the Python language and write basic scripts using variables, operators, and control structures.
CO2:	Manipulate composite data structures such as lists, tuples, dictionaries, data frames, and sets for effective data handling
CO3:	Design and implement object-oriented programming concepts (classes, objects, inheritance, and method overriding) to solve real-world problems
CO4:	Apply user-defined functions, modules, and standard library packages to structure and reuse code efficiently..
CO5:	Implement robust exception handling mechanisms to manage runtime errors gracefully.

Approved By:-
Head of Department