Department of Computer Science and Engineering

Regulation2017

Course Outcomes (COs)

ODD SEM

I I YEAR (5 Theory + 4 Labs)

Si.No	Name of the Subject (In Abbreviation)	Course Outcomes	Statement
1	DISCRETE MATHEMATICS	CO1	Have knowledge of the concepts needed to test the logic of a program.
		CO2	Have an understanding in identifying structures on many levels.
		CO3	Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.
		CO4	Be aware of the counting principles.
		CO5	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields
		CO6	Apply the knowledge of argumental discrete mathematical problems.
2	DIGITAL PRINCIPLES AND SYSTEM DESIGN	CO1	Design various combinational digital circuits using logic gates
		CO2	Design sequential circuits and analyze the design procedures
		CO3	State the fundamentals of computer systems and analyze the execution of an instruction
		CO4	Analyze different types of control design and identify hazards
		CO5	Identify the characteristics of various memory systems and I/O communication.
		CO6	Apply memory and sequential programmable device.
3	DATA STRUCTURES	CO1	Implement abstract data types for linear data structures.
		CO2	Apply the different linear data structures to problem solutions.

			CO3	Critically analyze the various sorting algorithms.
			CO4	Implement graphs and trees for data structures
			CO5	Implement Extensible hashing techniques
			CO6	Apply searching sorting techniques
4	OBJECT ORIENTED PROGRAMMING		CO1	Develop Java programs using OOP principles
			CO2	Develop Java programs with the concepts inheritance and interfaces
			CO3	Build Java applications using exceptions and I/O streams
			CO4	Develop Java applications with threads and generics classes
			CO5	Develop interactive Java programs using swings
			CO6	Develop 2D techniques for event driven programming
5	Foundations of Data Science		CO1	Define the data science process
			CO2	Understand different types of data description for data science process
			CO3	Gain knowledge on relationships between data
			CO4	Use the Python Libraries for Data Wrangling
			CO5	Apply visualization Libraries in Python to interpret and explore data
			CO6	Use Geographic data with visualization libraries.
6	DATA STRUCTURES LABORATORY		CO1	Implement Linear data structure algorithms
			CO2	Implement applications using Stacks and Linked lists
			CO3	Implement Binary Search tree and AVL tree operations.
			CO4	Apply Trees and Graph for given problem
			CO5	.Implement graph algorithms
			CO6	Analyze the various searching and sorting algorithms
7	OBJECT ORIENTED PROGRAMMING LABORATORY		CO1	Design and develop java programs using object oriented programming concepts.
			CO2	Develop simple applications using object oriented concepts such as package, exceptions
			CO3	Implement multithreading, and generics concepts
			CO4	Create GUIs and event driven programming applications for real world problems
			CO5	Implement and deploy web applications using Java.

		CO6	Implement JavaFX controls using java
8	Data Science Laboratory	CO1	Make use of the python libraries for data science
		CO2	Make use of the basic Statistical and Probability measures for data science.
		CO3	Perform descriptive analytics on the benchmark data sets.
		CO4	Perform correlation and regression analytics on standard data sets
		CO5	Present and interpret data using visualization packages in Python.
		CO6	Present Geographic Data with Basemap using Visualization
9	Professional Development	CO1	Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements
		CO2	Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding
		CO3	Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.
		CO4	
		CO5	
		CO6	

Department of Computer Science and Engineering

Regulation2017

Course Outcomes (COs)

EVEN SEM

II YEAR (6 Theory + 4 Labs)

Si.No	Name of the Subject (In Abbreviation)	Course Outcomes	Statement
1	Theory of Computation	CO1	Construct automata theory using Finite Automata
		CO2	Write regular expressions for any pattern
		CO3	Design context free grammar and Pushdown Automata
		CO4	Design Turing machine for computational functions
		CO5	Differentiate between decidable and undecidable problems
		CO6	Interpret NP class problems
2	Artificial Intelligence and Machine Learning	CO1	Use appropriate search algorithms for problem solving
		CO2	Apply reasoning under uncertainty
		CO3	Build supervised learning models
		CO4	Build ensembling and unsupervised models
		CO5	Build deep learning neural network models
		CO6	Build ReLU, hyperparameter tuning in neural networks
3	DATABASE MANAGEMENT SYSTEMS	CO1	Construct SQL Queries using relational algebra
		CO2	Design database using ER model and normalize the database
		CO3	Construct queries to handle transaction processing and maintain consistency of the database

		CO4	Compare and contrast various indexing strategies and apply the knowledge to tune the performance of the database
		CO5	Appraise how advanced databases differ from Relational Databases and find a suitable database for the given requirement.
		CO6	Construct NOSQL, Graph databases.
4	Algorithms	CO1	Analyze the efficiency of algorithms using various frameworks
		CO2	Apply graph algorithms to solve problems and analyze their efficiency.
		CO3	Make use of algorithm design techniques like divide and conquer, dynamic programming and greedy techniques to solve problems
		CO4	Use the state space tree method for solving problems.
		CO5	Solve problems using approximation algorithms and randomized algorithms
		CO6	
5	Introduction to Operating Systems	CO1	Analyze various scheduling algorithms and process synchronization
		CO2	Explain deadlock prevention and avoidance algorithms
		CO3	Compare and contrast various memory management schemes.
		CO4	Understand the functionality of file systems.
		CO5	Explain the functionality of file systems, I/O systems, and Virtualization
		CO6	Compare iOS and Android Operating Systems.
6	Environmental Sciences and Sustainability	CO1	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.
		CO2	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society
		CO3	To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.
		CO4	To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.
		CO5	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.
		CO6	To demonstrate the knowledge of Zero waste and R concept and ISO 14000 Series
7	DATABASE MANAGEMENT	CO1	Create databases with different types of key constraints.

	SYSTEMS LABORATORY	CO2	Construct simple and complex SQL queries using DML and DCL commands
		CO3	Use advanced features such as stored procedures and triggers and incorporate in GUI based application development.
		CO4	Create an XML database and validate with meta-data (XML schema)
		CO5	Create and manipulate data using NOSQL database.
		CO6	Build PL SQL / Stored Procedures
8	Operating Systems Laboratory	CO1	Define and implement UNIX Commands.
		CO2	Compare the performance of various CPU Scheduling Algorithms.
		CO3	Compare and contrast various Memory Allocation Methods.
		CO4	Define File Organization and File Allocation Strategies.
		CO5	Implement various Disk Scheduling Algorithms.
		CO6	Implement operating system like Linux using VMware

Department of Computer Science and Engineering

Regulation2017

Course Outcomes (COs)

ODD SEM

III YEAR (7 Theory + 4 Labs)

Si.No	Name of the Subject (In Abbreviation)	Course Outcomes	Statement
1	Computer Networks	CO1	Explain the basic layers and its functions in computer networks.
		CO2	Understand the basics of how data flows from one node to another.
		CO3	Analyze routing algorithms.
		CO4	Describe protocols for various functions in the network.
		CO5	Analyze the working of various application layer protocols.
		CO6	Design protocols for various functions in the network. Understand the working of various application layer protocols
2	Compiler Design	CO1	Understand the techniques in different phases of a compiler.
		CO2	Design a lexical analyser for a sample language and learn to use the LEX tool.
		CO3	Apply different parsing algorithms to develop a parser and learn to use YACC tool
		CO4	Understand semantics rules (SDT), intermediate code generation and run-time environment.
		CO5	Implement code generation and apply code optimization techniques.
		CO6	Design and implement a scanner and a parser using LEX and YACC tools.
3	Cryptography and Cyber Security	CO1	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
		CO2	Apply the different cryptographic operations of symmetric cryptographic algorithms

		CO3	Apply the different cryptographic operations of public key cryptography
		CO4	Apply the various Authentication schemes to simulate different applications.
		CO5	Understand various cyber crimes and cyber security.
		CO6	Understand Web Security, Wireless Security
4	Distributed Computing	CO1	Explain the foundations of distributed systems (K2)
		CO2	Solve synchronization and state consistency problems (K3)
		CO3	Use resource sharing techniques in distributed systems (K3)
		CO4	Apply working model of consensus and reliability of distributed systems (K3)
		CO5	Explain the fundamentals of cloud computing (K2)
		CO6	Explain the fundamentals of Virtualization
5	Professional Elective I Digital Marketing	CO1	To examine and explore the role and importance of digital marketing in today's rapidly changing business environment
		CO2	To focuses on how digital marketing can be utilized by organizations and how its effectiveness can be measured
		CO3	To know the key elements of a digital marketing strategy
		CO4	To study how the effectiveness of a digital marketing campaign can be measured
		CO5	To demonstrate advanced practical skills in common digital marketing tools such as SEO, SEM, Social media and Blogs.
		CO6	To study Recent trends in Digital marketing.
6	Professional Elective II Big Data Analytics	CO1	Describe big data and use cases from selected business domains
		CO2	Explain NoSQL big data management
		CO3	Install, configure, and run Hadoop and HDFS.
		CO4	Perform map-reduce analytics using Hadoop
		CO5	Use Hadoop-related tools such as HBase, Cassandra, Pig, and Hive for big data analytics.
		CO6	Perform HDFS concept
7	Mandatory Course-I DISASTER RISK REDUCTION AND MANAGEMENT	CO1	To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR)
		CO2	To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction
		CO3	To develop disaster response skills by adopting relevant tools and technology

		CO4	Enhance awareness of institutional processes for Disaster response in the country
		CO5	Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas where they live, with due sensitivity
		CO6	To study case studies Space Based Inputs for Disaster Mitigation and Management

Department of Computer Science and Engineering

Regulation2017

Course Outcomes (COs)

EVEN SEM

III YEAR (8 Theory + 4 Labs +1 Mini Projects)

Si.No	Name of the Subject (In Abbreviation)	Course Outcomes	Statement
1	Object Oriented Software Engineering	CO1	Compare various Software Development Lifecycle Models
		CO2	Evaluate project management approaches as well as cost and schedule estimation strategies.
		CO3	Perform formal analysis on specifications.
		CO4	Use UML diagrams for analysis and design.
		CO5	Architect and design using architectural styles and design patterns, and test the system
		CO6	
2	Embedded Systems and IoT	CO1	Explain the architecture of embedded processors.
		CO2	Write embedded C programs.
		CO3	Design simple embedded applications.
		CO4	Compare the communication models in IOT
		CO5	Design IoT applications using Arduino/Raspberry Pi /open platform.
		CO6	
4	Professional Elective II Business Analytics	CO1	Explain the real world business problems and model with analytical solutions.
		CO2	Identify the business processes for extracting Business Intelligence
		CO3	Apply predictive analytics for business fore-casting
		CO4	Apply analytics for supply chain and logistics management
		CO5	Use analytics for marketing and sales.
		CO6	Predictive analytics for customers' behaviour in marketing and sales.

5	Professional Elective IV Social Network Security	CO1	Develop semantic web related simple applications
		CO2	Address Privacy and Security issues in Social Networking
		CO3	Explain the data extraction and mining of social networks
		CO4	Discuss the prediction of human behavior in social communities
		CO5	Describe the applications of social networks
		CO6	Describe the role of Identity provisioning
6	Professional Elective V Dataware Housing	CO1	Design data warehouse architecture for various Problems
		CO2	Apply the OLAP Technology
		CO3	Analyse the partitioning strategy
		CO4	Critically analyze the differentiation of various schema for given problem
		CO5	Frame roles of process manager & system manager
		CO6	Analyse the testing for System manager and Process manager
7	Professional Elective VI Cloud Computing	CO1	Analyse the virtualization concepts and Hypervisor
		CO2	Apply the Virtualization for real-world applications
		CO3	Install & Configure the different VM platforms
		CO4	Develop RAID in storage Virtulization
		CO5	Experiment with the VM with various software
		CO6	Apply case studies with VM
8	Mandatory Course-II Industrial Safety	CO1	Understand the basic concept of safety
		CO2	Obtain knowledge of Statutory Regulations and standards
		CO3	Know about the safety Activities of the Working Place
		CO4	Analyze on the impact of Occupational Exposures and their Remedies
		CO5	Obtain knowledge of Risk Assessment Techniques
		CO6	Analyze Hazard Identification Techniques

Department of Computer Science and Engineering

Regulation2017

Course Outcomes (COs)

ODD SEM

IV YEAR (5 Theory + 2 Labs)

Si.No	Name of the Subject (In Abbreviation)	Course Outcomes	Statement
1	Human Values and Ethics	CO1	Identify the importance of democratic, secular and scientific values in harmonious functioning of social life
		CO2	Practice democratic and scientific values in both their personal and professional life.
		CO3	Find rational solutions to social problems.
		CO4	Behave in an ethical manner in society
		CO5	Practice critical thinking and the pursuit of truth.
		CO6	Analyze Role and Responsibility of Scientist in the modern society
2	Open Elective – II Geographical Information System	CO1	Have basic idea about the fundamentals of GIS
		CO2	Understand the types of data models.
		CO3	Get knowledge about data input and topology
		CO4	Gain knowledge on data quality and standards
		CO5	Understand data management functions and data output
		CO6	Understand Enterprise Vs. Desktop GIS-distributed GIS.
3	Open Elective – III IT in Agricultural System	CO1	The students shall be able to understand the applications of IT in remote sensing applications such as Drones etc.
		CO2	The students will be able to get a clear understanding of how a greenhouse can be automated and its advantages.
		CO3	The students will be able to apply IT principles and concepts for management of field operations.
		CO4	The students will get an understanding about weather models, their inputs and applications
		CO5	The students will get an understanding of how IT can be used for e-governance in agriculture.
		CO6	The students will get an understanding of how IT can be used in Rural areas.

4	Open Elective – IV Renewable Energy System	CO1	Attained knowledge about various renewable energy technologies
		CO2	Ability to understand and design a PV system
		CO3	Understand the concept of various wind energy system
		CO4	Gained knowledge about various possible hybrid energy systems
		CO5	Attained knowledge about various application of renewable energy technologies
		CO6	Understand the concept mini-hydel power plant
5	Summer internship	CO1	Industry Practices, Processes,Techniques, technology, automation and other core aspects of software industry
		CO2	Analyze, Design solutions to complex business problems
		CO3	Build and deploy solutions for target platform
		CO4	Preparation of Technical reports and presentation.
		CO5	Compile all the work performed and generate the report for the project
		CO6	Deploy and support the solutions for better manageability of the solutions and provide scope for improvability

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Regulation2017

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EVEN SEM

IV YEAR

Si.No	Name of the Subject (In Abbreviation)	Course Outcomes	Statement
1	Project Work/Internship	CO1	Gain Domain knowledge and technical skill set required for solving industry / research problems
		CO2	Provide solution architecture, module level designs, algorithms
		CO3	Implement, test and deploy the solution for the target platform
		CO4	Prepare detailed technical report, demonstrate and present the work
		CO5	Compile all the work performed and generate the report for the project
		CO6	Deploy and support the solutions for better manageability of the solutions and provide scope for improvability