R21-REGULATIONS

COURSE TITLE	COURSE CODE	CO NO	COURSE OUTCOMES
ALGEBRA & CALCULUS	**21MA1001**	CO 1	Solve the system of linear equations, using technology to facilitate row reduction determine the rank, eigenvalues and eigenvectors **(BL-3)**
		CO 2	Analyzethe ordinary differential equations to provide solutions of various engineering applications**.(BL-4)**
		CO 3	Apply the mathematical knowledge of higher order differential equations to solve various engineering problems.(**BL-3)**
		CO 4	Describe the knowledge of Mean Value theorems andfunctions of several variables for engineering applications.(**BL-2**)
		CO 5	Analyze the partial differential equations to provide solutions of various engineering applications.(**BL-4**)
BASIC ELECTRICAL & ELECTRONICS ENGINEERING	**21ES1004**	CO1	Summarize the basic concepts of R,L,C ,voltage ,current and power of a circuit (**BL-3)**
		CO2	Describe the principle, working and construction of DC Generators &Motor (**BL-2)**
		CO3	Describethe construction, operation, types and equivalent circuit of a single phase transformer. **(BL-2)**
		CO4	Analyze the Semiconductor Diodes. (**BL-3)**
		CO5	Analyze the behavior of BJT. **(BL-3)**
CHEMISTRY	**21CH1001**	CO 1	Illustratethemolecular orbital energy level diagram of different molecular species.(**BL-3)**
		CO 2	Achieve the knowledge about various kinds of electro chemical cells.(**BL-2)**
		CO 3	Describe various energy storage devices and emerging technologies**.(BL-2)**
		CO 4	Understand the mechanism and applications of different polymers in electronic devices**.(BL-2)**
		CO 5	Familiarize the various sources of renewable energy and their harnessing**.(BL-2)**
ENGLISH	**21EN1001**	CO 1	Acquire in-depth knowledge on formulating appropriate sentences with Grammatical accuracy and also develop concept of word formation. **.(BL2)**
		CO 2	Describe coherent and unified paragraphs with adequate support and detail and can write a topic

			sentence, support and concluding sentence. (**BL2)**
		CO 3	Develop the writing and life skills in structural manner of real time scenarios. **(BL-2)**
		CO 4	Understand the grammar rules for synthesis of sentences and use prewriting strategies to plan to write dialogues, reviews and edit the text effectively**.(BL - 2)**
		CO 5	Interpret the skills and sub skills of reading and use strategies for reading effectively and provide knowledge on the structure and format of technical writing**.(BL - 2)**
NUMBER THEORY &APPLICATIONS	**21MA1002**	CO 1	Solveproblems on prime numbers **(BL-3)**
		CO 2	Apply Euclidean algorithmand its applications**.(BL-3)**
		CO 3	Apply Chinese remainder theorem and its applications**.(BL-3)**
		CO 4	Apply the concept ofcongruencesto various applications**.(BL-3)**
		CO 5	Makeuseofrho method and fermat factorization.(**BL-3**)
SEMICONDUCTOR PHYSICS	**21PH1004**	CO1	Understand the kinds of experimental results which are incompatible with classical physics and which required the development of a quantum theory of matter and light (**BL-1)**
		CO2	Summarize the importance of free electrons in determining the properties of metals and understand the concept of Fermi energy (**BL-1)**
		CO3	Understand the fundamentals of basic semiconductor physics which includes electronic materials and semiconductors **(BL-1)**
		CO4	Demonstrate the working of PN junction diode as switch and rectifier **(BL-3)**
		CO5	Understand the functioning of optical materials in opto-electronic devices **(BL-1)**
DATA STRUCTURES AND ALGORITHMS	**21ES1009**	CO 1	Analyze the data structure algorithms to evaluate the time & space complexities. **(BL-4)**
		CO 2	Apply the knowledge of stack and queues for various applications. (**BL - 3)**
		CO 3	Construct the linked lists for various applications. **(BL - 3)**
		CO 4	Apply the knowledge of tree data structures for various applications. **(BL - 3)**
		CO 5	Develop the graph models of the given problem through graph concepts (**BL - 3)**
COMPUTER ORGANIZATION	**21CS2001**	CO 1	Describe the concepts of Functional Architecture and Basic Operations of Computing System. (**BL-2)**

AND ARCHITECTURE		CO 2	Interpret there presentation of Fixed and Floating point numbers stored in digital computer. (**BL-3)**
		CO 3	Illustrate the basics of Instruction set and design of control units to execute Computer instruction. (**BL - 3**)
		CO 4	Analyze the Memory System and their impact on Computercost & performance. **(BL - 4)**
		CO 5	Demonstrate the basic knowledge of I/O devices and Interfacing of I/O devices with computer.(**BL - 3)**
DATABASE MANAGEMENT SYSTEMS	**21CS2002**	CO 1	Describe database technologies and database design. (BL-2)
		CO 2	Understand Relational Database Management Systems. **(BL-2)**
		CO 3	Construct queries, procedures for database creation in RDBMS**.(BL-3)**
		CO 4	Apply normalization on database design. **(BL-3)**
		CO 5	Demonstrate concurrency control techniques and techniques for database recovery. **(BL-2)**
MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE	**21CS2003**	CO 1	Understand the concepts associated with Mathematical Logic and Predicate calculus
		CO 2	Learn The Basic Concepts About Relations, Functions, Algebraic Structures And To Draw Different Diagrams Like Lattice, Hasse Diagrams
		CO 3	Understand The Elementary Combinatory And Pigeon-Hole Principle.
		CO 4	Describe Functions, Various Types Of Recurrence Relations And The Methods To Find Out Their Solutions.
		CO 5	Understand The Basic Concepts Associated With Graphs And Trees
OBJECT ORIENTED PROGRAMMING THROUGH JAVA	**21CS2004**	CO 1	Describe the basic Elements of Java for problem solving.(**BL-2)**
		CO 2	Demonstrate the concepts of arrays and strings for organizing data. (**BL-3)**
		CO 3	Describe the concepts of object oriented programming. (**BL-2)**
		CO 4	Design the web applications through java applets. **(BL-3)**
		CO 5	Develop Multi-threaded programs to improve the system performance . **(BL-6)**
DATA STRUCTURES AND ALGORITHMS LABORATORY	**21ES1513**	CO 1	Apply the Arrays and linked lists for solving the problems. (**BL -3)**
		CO 2	Apply the stacks and queues for solving the given applications. (**BL -3)**
		CO 3	Implement operations on binary trees and binary search trees for given applications. **(BL -3)**

		CO 4	Implement searching and sorting algorithms for given applications. **(BL -3)**
DATABASE MANAGEMENT SYSTEMS LABORATORY	**21CS2501**	CO 1	Use SQL for creating database and performing data manipulation operations. (**BL-3)**
		CO 2	Examine integrity constraints to build efficient databases. **(BL-3)**
		CO 3	Sketch PL/SQL programs including procedures, functions, cursors and triggers.(**BL-3)**
		CO 4	Apply queries using advanced database design and Normalization. (**BL-3)**
OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB	**21CS2502**	CO 1	Apply the fundamental elements of java programming to solve given problems.(**BL-3)**
		CO 2	Implement the concepts of object oriented programming to solve the applications. **(BL-3)**
		CO 3	Apply the Method overloading and exception handling mechanisms to solve given problems. **(BL-3)**
		CO 4	Apply the Multithreading and packages to improve the system performance. **(BL-3**)
EXPLORATORY DATA ANALYSIS WITH R	**21MA1007**	CO 1	Illustrate the fundamental knowledge of R-Programming concepts for solving the engineering applications **(BL-2)**
		CO 2	Apply data objects & probability commands for data manipulations **(BL-3)**
		CO 3	Apply descriptive statistics and data distribution commands for statistical analysis **(BL-3)**
		CO 4	Analyze hypothesis testing & graphical analysis on different data-sets for testable hypothesis and virtualization (**BL-4)**
		CO 5	Analyze complex analytical models using formula syntax and regression for data analysis (**BL-4)**
COMPUTER NETWORKS	**21CS2005**	CO 1	Describe the concepts of Internet in terms of its building blocks, organized layered architecture. (**BL-2)**
		CO 2	Identify the errors in data transfer between source and destination. (**BL-2)**
		CO 3	Demonstrate the skills of sub netting and routing protocols. **(BL-3)**
		CO 4	Illustrate the reliable, unreliable communication on public networks for various applications. **(BL-3)**
		CO 5	Explain the principles of Application Layer and its protocols(**BL-4).**

OPERATING SYSTEMS	**21CS2006**	CO 1	Illustrate the concepts and design of operating system of a computer. **(BL-2)**
		CO 2	Analyze CPU process scheduling and deadlock handling techniques provided with concurrencies. **(BL-4)**
		CO 3	Analyze the memory management and virtual memory concepts of an application. **(BL-4)**
		CO 4	Demonstrate the structure and implementation of file system for effective storage in a system. **(BL-2)**
		CO 5	Illustrate Mass Storage Structure and Protection Mechanism of a system. **(BL-2**)
SOFTWARE ENGINEERING	**21CS2007**	CO 1	Understand Fundamental concepts of software engineering and analyze process models required to develop a software system.(**BL-2)**
		CO 2	Analyze software requirements and model requirements for developing the application.(**BL-4)**
		CO 3	Apply software design and development techniqlues by understanding software architecture.(**BL-3)**
		CO 4	Analyze the User interface design techniques to design GUI.(**BL-4)**
		CO 5	Analyze the testing strategies and techniques for quality software.(**BL-4)**
DIGITAL LOGIC DESIGN		CO 1	Translate the numeric information in to different forms. **[BL:1]**
		CO 2	Apply K-Map and Tabular methods to minimize Boolean functions **[BL:3]**
		CO 3	Design various combinational logic circuits. **[BL:2]**
		CO 4	Design various sequential circuits **[BL:3]**
		CO 5	Design digital circuits using programmable logic devices**.[BL:3]**

EXPLORATORY DATA ANALYSIS WITH R LAB	**21MA1501**	CO 1	Configure R IDE tools and execute basic programs. **(BL-2)**
		CO 2	Execute commands and built-in functions in R Programming. (**BL-2)**
		CO 3	Implement data distribution and ANOVA techniques. (**BL-2)**
		CO 4	Construct programs on manipulating Data and Extracting Components. (**BL-2)**
OPERATING SYSTEMS &COMPUTER NETWORKS LAB	**21CS2503**	CO 1	Analyze and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, Priority and Dead lock detection, avoidance (**BL-3)**
		CO 2	Implement memory management schemes, page replacement schemes and File Organization techniques (**BL-3)**
		CO 3	Analyze the concept of data link layer to differentiate Error detection and Correction codes for a computer network. (**BL - 4)**
		CO 4	Analyze the concept of Network layer to differentiate various routing protocols for a network. (**BL - 4**)
SOFTWARE ENGINEERING LAB	**21CS2504**	CO 1	Select suitable software development process model for the given scenario (**BL-3)**
		CO 2	Classify the requirements and prepare software requirements specification for projects and perform modelling (**BL-2**)
		CO 3	Understand the various design techniques and implement **(BL-2)**
		CO 4	Apply testing principles for validating software project.(**BL-3)**
ARTIFICIAL INTELLIGENCE	**21CS2008**	CO 1	Familiar with basic principles of AI.
		CO 2	Explore the uninformed searching and solve the real world problems.
		CO 3	Understanding the various informed searching strategies.
		CO 4	Aware of knowledge, reasoning and its implementation.
		CO 5	Understand the basics in learning and apply the learning strategies to practical applications.
DESIGN AND ANALYSIS OF	**21CS2009**	CO 1	Understand the general principle of Divide and Conquer and identify suitable problems to apply

ALGORITHMS			Divide and Conquer paradigm.(**BL-2**)
		CO 2	Understand optimization problems and the general principles of Greedy and Dynamic Programming paradigms to solve them.(**BL-2**)
		CO 3	Apply backtracking to solve optimization problem.(**BL-3)**
		CO 4	Analyze the advantage of bounding functions in Branch and Bound technique to solve the problems. (**BL-3)**
		CO 5	Classify deterministic and Non-deterministic algorithms for P, NP, NP –hard and NP-complete classes of problems.(**BL-2)**
THEORY OF COMPUTATION	**21CS2010**	CO 1	Demonstrate the concepts of language to perform finite automata.(**BL-2**)
		CO 2	Demonstrate the finite automata to recognize patterns in programs.(**BL-2**)
		CO 3	Construct the Regular Grammar from Regular expression t**o** specify how to form grammatically correct strings in the programming language(**BL-3)**
		CO 4	Analyze theContext free grammar by minimizing redundancy from the grammar of a program. (**BL-4)**
		CO 5	Describe the Push down automata conceptsto access a limited amount of information on the stack in a program. **(BL-2)**
MICROPROCESSORS AND MICROCONTROLLERS	**21CS2007**	CO 1	**Interpret** the working principles of 8086 Microprocessor .(**BL-2)**
		CO 2	**Analyze**the **Instructionformats and addressing modes** 8086 processor.(**BL-4)**
		CO 3	**Demonstrate** the features, architecture & addressing modes and instruction set of MSP 430.(**BL-2)**
		CO 4	**Analyze** the **modes of MSP 430**. (**BL-4**)
		CO 5	**Illustrate** the principles of **serial communication interfaces used with MSP 430**. (**BL-2)**
ARTIFICIAL INTELLIGENCE LABORATORY	**21CS2505**	CO 1	Apply the good programming skills to formulate the solutions for computational problems.**[BL-3]**
		CO 2	Design and develop solutions for informed and uninformed search problems in AI.[**BL-3**]
		CO 3	Apply AI Techniques in Gaming [**BL-3**]
		CO 4	Demonstrate and enrich fundamentals in knowledge and its schemes **[BL-2]**
DESIGN AND ANALYSIS OF ALGORITHMS LABORATORY	**21CS2507**	CO 1	Demonstrate searching and sorting technique and calculate the time required to search and sort the elements by using Divide and Conquer method (**BL-2)**
		CO 2	Apply Greedy method to solve knapsack problem

			and minimum cost spanning tree problem. (**BL-3)**
		CO 3	Apply dynamic programming strategy to solve multistage problem and knapsack problem. (**BL-3)**
		CO 4	Apply backtracking method to calculate 8-queen's problem and sub set problem. (**BL-3)**