

**R20-REGULATIONS**

COURSE TITLE	COURSE CODE	CO NO	COURSE OUTCOMES
<b>ALGEBRA &amp; CALCULUS</b>	<b>20MA1001</b>	CO 1	Solve the system of linear equations, using technology to facilitate row reduction determine the rank, eigenvalues and eigenvectors <b>(BL-3)</b>
		CO 2	Analyzethe ordinary differential equations to provide solutions of various engineering applications. <b>(BL-4)</b>
		CO 3	Apply the mathematical knowledge of higher order differential equations to solve various engineering problems. <b>(BL-3)</b>
		CO 4	Describe the knowledge of Mean Value theorems andfunctions of several variables for engineering applications. <b>(BL-2)</b>
		CO 5	Analyze the partial differential equations to provide solutions of various engineering applications. <b>(BL-4)</b>
		CO 6	Apply techniques of Multiple integrals for the area of region bounded by curves and volume. <b>[BL-3]</b>
<b>BASIC ELECTRICAL &amp; ELECTRONICS ENGINEERING</b>	<b>20ES1003</b>	CO1	Summarize the basic concepts of R,L,C ,voltage ,current and power of a circuit <b>(BL-3)</b>
		CO2	Describe the principle, working and construction of DC Generators &Motor <b>(BL-2)</b>
		CO3	Describethe construction, operation, types and equivalent circuit of a single phase transformer. <b>(BL-2)</b>
		CO4	Analyze the Semiconductor Diodes. <b>(BL-3)</b>
		CO5	Analyze the behavior of BJT. <b>(BL-3)</b>
		CO6	Describe the working of MOSFET. <b>(BL-3)</b>
<b>CHEMISTRY</b>	<b>20CH1001</b>	CO 1	Illustratethemolecular orbital energy level diagram of different molecular species. <b>(BL-3)</b>
		CO 2	Achieve the knowledge about various kinds of electro chemical cells. <b>(BL-2)</b>
		CO 3	Describe various energy storage devices and emerging technologies. <b>(BL-2)</b>
		CO 4	Understand the mechanism and applications of different polymers in electronic devices. <b>(BL-2)</b>
		CO 5	Familiarize the various sources of renewable energy and their harnessing. <b>(BL-2)</b>
		CO 6	Applythe spectroscopy methods for the analysis of engineering materials. <b>(BL-3)</b>

ENGLISH	20EN1001	CO 1	Acquire in-depth knowledge on formulating appropriate sentences with Grammatical accuracy and also develop concept of word formation. <b>.(BL2)</b>
		CO 2	Describe coherent and unified paragraphs with adequate support and detail and can write a topic sentence, support and concluding sentence. <b>(BL2)</b>
		CO 3	Develop the writing and life skills in structural manner of real time scenarios. <b>(BL-2)</b>
		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. <b>(BL - 2)</b>
		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. <b>(BL - 2)</b>
		CO 6	Use the concepts of various real time scenarios to represent in an effective model. <b>(BL - 3)</b>
NUMBER THEORY & APPLICATIONS	20MA1002	CO 1	Solve problems on prime numbers <b>(BL-3)</b>
		CO 2	Apply Euclidean algorithm and its applications. <b>(BL-3)</b>
		CO 3	Apply Chinese remainder theorem and its applications. <b>(BL-3)</b>
		CO 4	Apply the concept of congruence to various applications. <b>(BL-3)</b>
		CO 5	Make use of rho method and fermat factorization. <b>(BL-3)</b>
		CO 6	Develop various encryption methods and its applications. <b>(BL-3)</b>
SEMICONDUCTOR PHYSICS	20PH1003	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 <b>(BL-1)</b>
		CO2	Summarize the importance of free electrons in determining the properties of metals and understand the concept of Fermi energy <b>(BL-1)</b>
		CO3	Understand the fundamentals of basic semiconductor physics which includes electronic materials and semiconductors <b>(BL-1)</b>
		CO4	Demonstrate the working of PN junction diode as switch and rectifier <b>(BL-3)</b>
		CO5	Understand the functioning of optical materials in opto-electronic devices <b>(BL-1)</b>
		CO6	Describe the basic laser physics, working of lasers and principle of propagation of light in optical fibers <b>(BL-3)</b>

<b>DATA STRUCTURES AND ALGORITHMS</b>	<b>20ES1012</b>	CO 1	Analyze the data structure algorithms to evaluate the time & space complexities. <b>(BL-4)</b>
		CO 2	Apply the knowledge of stack and queues for various applications. <b>(BL - 3)</b>
		CO 3	Construct the linked lists for various applications. <b>(BL - 3)</b>
		CO 4	Apply the knowledge of tree data structures for various applications. <b>(BL - 3)</b>
		CO 5	Develop the graph models of the given problem through graph concepts <b>(BL - 3)</b>
<b>COMPUTER ORGANIZATION AND ARCHITECTURE</b>	<b>20CS2001</b>	CO 1	Describe the concepts of Functional Architecture and Basic Operations of Computing System. <b>(BL-2)</b>
		CO 2	Interpret there presentation of Fixed and Floating point numbers stored in digital computer. <b>(BL-3)</b>
		CO 3	Illustrate the basics of Instruction set and design of control units to execute Computer instruction. <b>(BL - 3)</b>
		CO 4	Analyze the Memory System and their impact on Computercost & performance. <b>(BL - 4)</b>
		CO 5	Demonstrate the basic knowledge of I/O devices and Interfacing of I/O devices with computer. <b>(BL - 3)</b>
<b>DATABASE MANAGEMENT SYSTEMS</b>	<b>20CS2002</b>	CO 1	Describe database technologies and database design. <b>(BL-2)</b>
		CO 2	Understand Relational Database Management Systems. <b>(BL-2)</b>
		CO 3	Construct queries, procedures for database creation in RDBMS. <b>(BL-3)</b>
		CO 4	Apply normalization on database design. <b>(BL-3)</b>
		CO 5	Demonstrate concurrency control techniques and techniques for database recovery. <b>(BL-2)</b>
<b>MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE</b>	<b>20CS2003</b>	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
<b>OBJECT ORIENTED PROGRAMMING THROUGH JAVA</b>	<b>20CS2004</b>	CO 1	Describe the basic Elements of Java for problem solving. <b>(BL-2)</b>
		CO 2	Demonstrate the concepts of arrays and strings for organizing data. <b>(BL-3)</b>

		CO 3	Describe the concepts of object oriented programming. <b>(BL-2)</b>
		CO 4	Design the web applications through java applets. <b>(BL-3)</b>
		CO 5	Develop Multi-threaded programs to improve the system performance . <b>(BL-6)</b>
<b>DATA STRUCTURES AND ALGORITHMS LABORATORY</b>	<b>20ES1515</b>	CO 1	Apply the Arrays and linked lists for solving the problems. <b>(BL -3)</b>
		CO 2	Apply the stacks and queues for solving the given applications. <b>(BL -3)</b>
		CO 3	Implement operations on binary trees and binary search trees for given applications. <b>(BL -3)</b>
		CO 4	Implement searching and sorting algorithms for given applications. <b>(BL -3)</b>
<b>DATABASE MANAGEMENT SYSTEMS LABORATORY</b>	<b>20CS2501</b>	CO 1	Use SQL for creating database and performing data manipulation operations. <b>(BL-3)</b>
		CO 2	Examine integrity constraints to build efficient databases. <b>(BL-3)</b>
		CO 3	Sketch PL/SQL programs including procedures, functions, cursors and triggers. <b>(BL-3)</b>
		CO 4	Apply queries using advanced database design and Normalization. <b>(BL-3)</b>
<b>OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB</b>	<b>20CS2502</b>	CO 1	Apply the fundamental elements of java programming to solve given problems. <b>(BL-3)</b>
		CO 2	Implement the concepts of object oriented programming to solve the applications. <b>(BL-3)</b>
		CO 3	Apply the Method overloading and exception handling mechanisms to solve given problems. <b>(BL-3)</b>
		CO 4	Apply the Multithreading and packages to improve the system performance. <b>(BL-3)</b>
<b>STATISTICAL ANALYSIS AND TECHNIQUES USING R</b>	<b>20MA1007</b>	CO 1	Illustrate the fundamental knowledge of R-Programming concepts for solving the engineering applications <b>(BL-2)</b>
		CO 2	Apply data objects & probability commands for data manipulations <b>(BL-3)</b>
		CO 3	Apply descriptive statistics and data distribution commands for statistical analysis <b>(BL-3)</b>
		CO 4	Analyze hypothesis testing & graphical analysis on different data-sets for testable hypothesis and virtualization <b>(BL-4)</b>
		CO 5	Analyze complex analytical models using formula syntax and regression for data analysis <b>(BL-4)</b>
<b>COMPUTER NETWORKS</b>	<b>20CS2005</b>	CO 1	Describe the concepts of Internet in terms of its building blocks, organized layered architecture. <b>(BL-2)</b>

		CO 2	Identify the errors in data transfer between source and destination. <b>(BL-2)</b>
		CO 3	Demonstrate the skills of sub netting and routing protocols. <b>(BL-3)</b>
		CO 4	Illustrate the reliable, unreliable communication on public networks for various applications. <b>(BL-3)</b>
		CO 5	Explain the principles of Application Layer and its protocols <b>(BL-4)</b> .
<b>OPERATING SYSTEMS</b>	<b>20CS2006</b>	CO 1	Illustrate the concepts and design of operating system of a computer. <b>(BL-2)</b>
		CO 2	Analyze CPU process scheduling and deadlock handling techniques provided with concurrencies. <b>(BL-4)</b>
		CO 3	Analyze the memory management and virtual memory concepts of an application. <b>(BL-4)</b>
		CO 4	Demonstrate the structure and implementation of file system for effective storage in a system. <b>(BL-2)</b>
		CO 5	Illustrate Mass Storage Structure and Protection Mechanism of a system. <b>(BL-2)</b>
<b>SOFTWARE ENGINEERING</b>	<b>20CS2007</b>	CO 1	Understand Fundamental concepts of software engineering and analyze process models required to develop a software system. <b>(BL-2)</b>
		CO 2	Analyze software requirements and model requirements for developing the application. <b>(BL-4)</b>
		CO 3	Apply software design and development techniques by understanding software architecture. <b>(BL-3)</b>
		CO 4	Analyze the User interface design techniques to design GUI. <b>(BL-4)</b>

		CO 5	Analyze the testing strategies and techniques for quality software.( <b>BL-4</b> )
<b>DIGITAL LOGIC DESIGN</b>		CO 1	Translate the numeric information in to different forms. [ <b>BL:1</b> ]
		CO 2	Apply K-Map and Tabular methods to minimize Boolean functions [ <b>BL:3</b> ]
		CO 3	Design various combinational logic circuits. [ <b>BL:2</b> ]
		CO 4	Design various sequential circuits [ <b>BL:3</b> ]
		CO 5	Design digital circuits using programmable logic devices.[ <b>BL:3</b> ]
<b>STATISTICS ANALYSIS AND TECHNIQUES USING R LAB</b>	<b>20MA1501</b>	CO 1	Configure R IDE tools and execute basic programs. ( <b>BL-2</b> )
		CO 2	Execute commands and built-in functions in R Programming. ( <b>BL-2</b> )
		CO 3	Implement data distribution and ANOVA techniques. ( <b>BL-2</b> )
		CO 4	Construct programs on manipulating Data and Extracting Components. ( <b>BL-2</b> )
<b>OPERATING SYSTEMS &amp;COMPUTER NETWORKS LAB</b>	<b>20CS2503</b>	CO 1	Analyze and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, Priority and Dead lock detection, avoidance ( <b>BL-3</b> )
		CO 2	Implement memory management schemes, page replacement schemes and File Organization techniques ( <b>BL-3</b> )
		CO 3	Analyze the concept of data link layer to differentiate Error detection and Correction codes for a computer network. ( <b>BL - 4</b> )
		CO 4	Analyze the concept of Network layer to differentiate various routing protocols for a network. ( <b>BL - 4</b> )
<b>SOFTWARE ENGINEERING LAB</b>	<b>20CS2504</b>	CO 1	Select suitable software development process model for the given scenario ( <b>BL-3</b> )
		CO 2	Classify the requirements and prepare software requirements specification for projects and perform modelling ( <b>BL-2</b> )
		CO 3	Understand the various design techniques and implement ( <b>BL-2</b> )
		CO 4	Apply testing principles for validating software

			project.( <b>BL-3</b> )
<b>ARTIFICIAL INTELLIGENCE</b>	<b>20CS2008</b>	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.
<b>DESIGN AND ANALYSIS OF ALGORITHMS</b>	<b>20CS2009</b>	CO 1	Understand the general principle of Divide and Conquer and identify suitable problems to apply Divide and Conquer paradigm.( <b>BL-2</b> )
		CO 2	Understand optimization problems and the general principles of Greedy and Dynamic Programming paradigms to solve them.( <b>BL-2</b> )
		CO 3	Apply backtracking to solve optimization problem.( <b>BL-3</b> )
		CO 4	Analyze the advantage of bounding functions in Branch and Bound technique to solve the problems. ( <b>BL-3</b> )
		CO 5	Classify deterministic and Non-deterministic algorithms for P, NP, NP -hard and NP-complete classes of problems.( <b>BL-2</b> )
<b>THEORY OF COMPUTATION</b>	<b>20CS2010</b>	CO 1	Demonstrate the concepts of language to perform finite automata.( <b>BL-2</b> )
		CO 2	Demonstrate the finite automata to recognize patterns in programs.( <b>BL-2</b> )
		CO 3	Construct the Regular Grammar from Regular expression to specify how to form grammatically correct strings in the programming language( <b>BL-3</b> )
		CO 4	Analyze the Context free grammar by minimizing redundancy from the grammar of a program. ( <b>BL-4</b> )
		CO 5	Describe the Push down automata concepts to access a limited amount of information on the stack in a program. ( <b>BL-2</b> )
<b>MICROPROCESSORS AND MICROCONTROLLERS</b>	<b>20CS2007</b>	CO 1	<b>Interpret</b> the working principles of 8086 Microprocessor .( <b>BL-2</b> )
		CO 2	<b>Analyze</b> the <b>Instruction formats and addressing modes</b> 8086 processor.( <b>BL-4</b> )
		CO 3	<b>Demonstrate</b> the features, architecture & addressing modes and instruction set of MSP 430.( <b>BL-2</b> )
		CO 4	<b>Analyze</b> the <b>modes of MSP 430.</b> ( <b>BL-4</b> )
		CO 5	<b>Illustrate</b> the principles of <b>serial communication interfaces used with MSP 430.</b> ( <b>BL-2</b> )
<b>ARTIFICIAL</b>	<b>20CS2505</b>	CO 1	Apply the good programming skills to formulate the

<b>INTELLIGENCE LABORATORY</b>			solutions for computational problems.[ <b>BL-3</b> ]
		CO 2	Design and develop solutions for informed and uninformed search problems in AI.[ <b>BL-3</b> ]
		CO 3	Apply AI Techniques in Gaming [ <b>BL-3</b> ]
		CO 4	Demonstrate and enrich fundamentals in knowledge and its schemes [ <b>BL-2</b> ]
<b>DESIGN AND ANALYSIS OF ALGORITHMS LABORATORY</b>	<b>20CS2507</b>	CO 1	Demonstrate searching and sorting technique and calculate the time required to search and sort the elements by using Divide and Conquer method ( <b>BL-2</b> )
		CO 2	Apply Greedy method to solve knapsack problem and minimum cost spanning tree problem. ( <b>BL-3</b> )
		CO 3	Apply dynamic programming strategy to solve multistage problem and knapsack problem. ( <b>BL-3</b> )
		CO 4	Apply backtracking method to calculate 8-queen's problem and sub set problem. ( <b>BL-3</b> )