Department of Computer Science and Engineering

I year I Semester Course Outcomes (R20)

Linear Algebra and Calculus (20A54101)

COs	Course Outcome
1	Make use the concepts of Matrices to solve various Engineering problems
2	Illustrate the knowledge of Mean Value theorems for engineering applications.
3	Apply the concepts of maxima and minima for various engineering problems.
4	Apply the Multiple integrals to determine areas and volumes of engineering applications.
5	Assess the importance of special functions and its applications.

Chemistry (20A51101T)

COs	Course Outcome
1	Apply Schrodinger wave equation to hydrogen atom
2	Apply the principle of Band diagrams in application of conductors and semiconductors
3	Illustrate the theory of construction of battery and fuel cells
4	Describe the mechanism of conduction in conducting polymers
5	Understand the principles of different analytical instruments

C-Programming & Data Structures (20A05201T)

COs	Course Outcome
1	Apply C basic concepts to implement C programs.
2	Implement applications in C, using functions, arrays, pointers and structures.
3	Apply the concepts of Stacks and Queues in solving the problems.
4	Explore various operations on Linked lists
5	Demonstrate various tree traversals, graph traversal techniques and searching-sorting methods.

Basic Electrical & Electronics Engineering (20A02101T)

COs	Course Outcome
1	Analyze simple electric circuits with DC&AC excitation
2	Illustrate principle and operation of DC Generator & Motor.
3	Understand working operation of various generating stations
4	Apply the concept of science and mathematics to explain the working of diodes and its applications, working of transistor and to solve the simple problems based on the
5	Analyze Op-Amp based comparator, differentiator and integrator circuits.
6	Illustrate the functionality of logic gates.

Engineering Workshop (20A03202)

COs	Course Outcome
1	Apply wood working skills in real world applications.
2	Build different parts with metal sheets in real world applications.
3	Apply fitting operations in various applications.

IT Workshop (20A05202I)

COs	Course Outcome
1	Disassemble and Assemble a Personal Computer and prepare the computer ready to
2	Develop office utilities using MS Office package.
3	Access the Internet and Browse it to obtain the required information.

Chemistry Lab (20A51101P)

COs	Course Outcome
1	Determine the cell constant and conductance of solutions
2	Interpret the strength of an acid present in secondary batteries
3	Demonstrate advanced polymer materials are used in engineering applications.

C-Programming & Data Structures Lab (20A05201P)

COs	Course Outcome
1	Demonstrate basic concepts of C programming language.
2	Develop C programs using functions, arrays, structures and pointers.
3	Illustrate the concepts Stacks, Queues and Linked Lists

Basic Electrical & Electronics Engineering Lab (20A02101P)

COs	Course Outcome
1	Analyze the various characteristics on DC Machines by conducting various tests.
2	Apply the knowledge to perform various tests on 1-phase transformer
3	Analyze the application of diode as rectifiers, clippers and clampers and other circuits.

I year II Semester Course Outcomes (R20)

Probability & Statistics (20A54202)

COs	Course Outcomes
1	Apply regression analysis to Estimate business and engineering Trend values.
2	Apply the probability basic concepts to predict the information about on data.
3	Evaluate expected mean lifetime, failure rates, and service rates of equipment by using probability distribution.
4	Test the hypothesis to Interpret the results by using Large sample Tests.
5	Test hypothesis to Interpret the results by using small sample Tests.

Applied Physics (20A56201T)

COs	Course Outcomes
1	Interpret the concepts of physical optics like interference, diffraction and polarization in various engineering applications.
2	Identify the applications of optical fibers and Lasers in various fields
3	Outline the significant concepts of dielectric and magnetic materials for potential applications in the emerging micro devices.
4	Study the quantum mechanical picture of subatomic world along with the discrepancies between the classical estimates and laboratory observations of electron transportation phenomena by free electron theory and band theory
5	Demonstrate the physical properties exhibited by materials through the understanding of properties of semiconductors and superconductors.

Communicative English (20A52101T)

COs	Course Outcomes
1	Interpret the communication and writing skills in general communication.
2	Practice the writing and life skills in structural manner of real time scenarios.
3	Relate the knowledge of writing and speaking skills to enhance the career opportunities.
4	Illustrate the concepts of writing and speaking skills to develop the skills in job opportunities.
5	Comprehend, discuss and respond to academic texts orally and in writing

Python Programming & Data Science (20A05101T)

COs	Course Outcomes
1	Identify the appropriate data structure of Python for solving a problem
2	Solve the problems by applying the modularity principle.
3	Demonstrate data analysis, manipulation and visualization of data using Python libraries
4	Enumerate machine learning algorithms
5	Analyze the various applications of Data Science.

Engineering Drawing (20A03101T)

COs	Course Outcomes
1	Draw different curves such as cycloid, involute and hyperbola
2	Know how to draw the projections of points, lines
3	Draw the projection of solids inclined to both the plains
4	Draw the sectional views of prism, cylinder, pyramid and cone
5	Draw the development of regular solids such as prism, cylinder, pyramid and cone

Engineering Graphics Lab (20A03101P)

COs	Course Outcomes
1	**Develop** the engineering imagination essential for successful design.
2	Select the utility of drafting & modelling packages in orthographic and isometric drawings.
3	Apply the usage of 2D and 3D modelling.

Communicative English Lab (20A52101P)

COs	Course Outcomes
1	Understand the different aspects of the English language proficiency with emphasis on LSRW skills.
2	Apply communication skills through various language learning activities.
3	Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension.

Applied Physics Lab (20A56201P)

COs	Course Outcomes
1	Understand the importance of optical phenomenon like Interference, diffraction and dispersion.
2	Comprehend the importance of optical fiber parameters in communication.
3	Recognize the importance of energy gap in the study of conductivity and Hall Effect in a semiconductor.

Python Programming & Data Science Lab (20A05101P)

COs	Course Outcomes
1	Illustrate the use of various data structures.
2	Analyze and manipulate Data using Pandas and visualizations using Matplotlib.
3	Apply appropriate data sets to the Machine Learning algorithms

Universal Human Values (20A52201)

COs	Course Outcomes
1	Comprehend themselves, and their surroundings family, society, nature.
2	Relate more responsibility in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
3	Use better critical ability.
4	Relate what they have understood (human values, human relationship and human society).
5	Use what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

II year I Semester Course Outcomes (R20)

Discrete Mathematics & Graph Theory (20A54304)

COs	Course Outcomes
1	Apply mathematical logic to solve problems.
2	Understand the concepts and perform the operations related to sets, relations and functions.
3	Apply basic counting techniques to solve combinatorial problems.
4	Formulate problems and solve recurrence relations.
5	Apply Graph Theory in solving computer science problems

Digital Electronics& Microprocessors (20A04304T)

COs	Course Outcomes
1	Understand all the concepts of Logic Gates and Boolean Functions.
2	Interpret the concepts of Combinational Logic Circuits
3	illustrate Sequential Logic Circuits
4	Design and develop applications using 8086 Microprocessor.
5	Design and develop applications using 8051Microcontroller.

Advanced Data Structures & Algorithms (20A05301T)

COs	Course Outcomes
1	Analyze the complexity of algorithms and apply asymptotic notations.
2	Apply non-linear data structures and their operations.
3	Apply Hashing Technics on various applications
4	Understand and apply greedy, divide and conquer algorithms.
5	Apply dynamic programming algorithms and Backtracking algorithms for various applications.

Object Oriented Programming Through Java (20A05302T)

COs	Course Outcomes
1	Solve real-world problems using OOP techniques.
2	Apply code reusability through inheritance, packages and interfaces
3	Illustrate Exception handling, Stream based I/O
4	Solve problems using java Multi-Threading and collection framework
5	Build GUIs and handle events generated by user interactions.

Computer Organization (20A05303)

COs	Course Outcomes
1	Understand the computer architecture, and the basic operations of instruction sets and addressing modes.
2	Illustrate the basic arithmetic, logical and bus organizations of processing unit.
3	Analyze the importance and trade-offs of different types of memories.
4	Understand the Various I/O transmission mechanisms.
5	Identify pipeline hazards and possible solutions to those hazards

Digital Electronics& Microprocessors Lab (20A04304P)

COs	Course Outcomes
1	Design any Logic circuit using basic concepts of Boolean Algebra.
2	Design and develop any application using 8086 Microprocessor.
3	Design and develop any application using 8051 Microcontroller.

Advanced Data Structures and Algorithms Lab (20A05301P)

COs	Course Outcomes
1	Understand and apply non-linear data structure operations.
2	Apply Greedy, divide and conquer algorithms.
3	Illustrate and apply backtracking algorithms, further able to understand non-deterministic algorithms.

Object Oriented Programming Through Java Lab (20A05302P)

COs	Course Outcomes
1	Recognize the java programming environment.
2	Develop efficient programs using multi-threading.
3	Extend the programming functionality supported by java.

Web application Development (20A05304)

COs	Course Outcomes
1	Construct web sites with valid HTML, CSS, JavaScript
2	Create responsive Web designs that work on phones, tablets, or traditional laptops and wide screen monitors.
3	Design and develop web applications using Content Management Systems like WordPress

Environmental Science (20A99201)

COs	Course Outcomes
1	Grasp multidisciplinary nature of environmental studies and various renewable and non-renewable resources.
2	Understand flow and bio-geo- chemical cycles and ecological pyramids.
3	Understand various causes of pollution and solid waste management and related preventive measures.
4	Explain the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation.
5	Illustrate Casus of population explosion, value education and welfare programmes.

II year II Semester Course Outcomes (R20)

Deterministic & Stochastic Statistical Methods (20A54404)

COs	Course Outcomes
1	Apply logical thinking to problem-solving in context.
2	Employ methods related to these concepts in a variety of data science applications.
3	Use appropriate technology to aid problem-solving and data analysis.
4	Use Bayesian process of inference in probabilistic reasoning system.
5	Demonstrate skills in unconstrained optimization.

Database Management Systems (20A05401T)

COs	Course Outcomes
1	Design a data base for a real world information system.
2	Create transactions which preserve the integrity of the database.
3	Generate the tables for a database.

4	Organize the data to process and optimize the queries.
5	Recognize the principles of database transaction management and database recovery.

Operating Systems (20A05402T)

COs	Course Outcomes
1	Construct the fundamentals of windows & Unix commands.
2	Apply the scheduling algorithm for given problem.
3	Develop the various methods in memory allocation and page replacement algorithm.
4	Understand deadlock prevention and avoidance.
5	Perform administrative tasks on Linux based systems.

Software Engineering (20A05403T)

COs	Course Outcomes
1	Describe the process to be followed in SDLC.
2	Define formulate and analyze a problem.
3	Apply design and testing principles to software project development & design methodology.
4	Apply the project management and analysis principles software development.
5	Apply software development life cycle and problem articulation.

Humanities Elective– I

Managerial Economics & Financial Analysis (20A52301)

COs	Course Outcomes
1	Understand the role and responsibilities of a managerial economist in modern business scenario.
2	Apply the demand of a product by using demand forecasting methods.
3	Apply the Break Even Point (BEP) with the help of production and cost analysis.
4	Understand their learning's about competitive markets and business economic environment.
5	Analyze the process of preparing financial statements to know financial position of the firm.

Database Management Systems Lab (20A05401P)

COs	Course Outcomes
1	Design a database of any real world problem.
2	Define the database SQL queries.
3	Implement the PL/SQL programs.

Operating Systems Lab (20A05402P)

COs	Course Outcomes
1	Demonstrate the fundamentals Unix commands and system calls.
2	Apply FCFS, SJF, Priority, Round Robin scheduling algorithms.
3	Experiment an algorithm to detect and avoid deadlock.

Software Engineering Lab (20A05403P)

COs	Course Outcomes
1	Acquaint with historical and modern software methodologies.
2	Demonstrate the phases of software projects and practice the activities of each phase.
3	Adopt skills such as distributed version control, unit testing, integration testing, build management, and deployment.

Skill Oriented Course– II
Exploratory Data Analysis with R (20A05404)

COs	Course Outcomes
1	Install and use R for simple programming tasks.
2	Explore statistical functions in R.
3	Use R Graphics and Tables to visualize results of various statistical operations on data.

Mandatory non-credit course – III
Design Thinking for Innovation (20A99401)

COs	Course Outcomes
1	Illustrate the concepts related to design thinking.
2	Apply the design thinking techniques for solving problems in various sectors.
3	Illustrate the fundamentals of Design Thinking and innovation

4	Analyse to work in a multidisciplinary environment
5	Analyse Design Thinking in Business Processes

NSS/NCC/NSO Activities (20A99301)

COs	Course Outcomes
1	Positive impact on students' academic learning
2	Improves students' ability to apply what they have learned in "the real world"
3	Positive impact on academic outcomes such as demonstrated complexity of understanding, problem analysis, problem-solving, critical thinking, and cognitive development

III year I Semester Course Outcomes (R20)

Computer Networks (20A05501T)

COs	Course Outcome
1	Identify the software and hardware components and functionality of each layer of a computer network.
2	Interpret medium access protocols
3	Analyse critically the existing routing protocols
4	Apply the appropriate transport protocol based on the application requirements
5	Illustrate Principles of Network Applications

Artificial Intelligence (20A05502T)

COs	Course Outcome
1	Identify the importance of AI and intelligent agent related to its environment.
2	Interpret the concepts of Solving Problems by searching to solve the problems by systematically.
3	Illustrate the concepts of Reinforcement and Natural Language Processing.
4	Apply the concepts involved in developing programs that translate from one language to another, or recognize spoken words.
5	Analyse the role of Robot in various applications and identify philosophical issues in AI.

Formal Languages and Automata Theory (20A05503)

COs	Course Outcome
1	Describe formal machines, languages and computations.

2	Design finite state machines for acceptance of strings.
3	Develop context free grammars for formal languages.
4	Build pushdown automata for context free grammars.
5	Develop Turing machine for solving problems and validate decidability and undesirability.

Professional Elective Course – I

Software Project Management (20A05504a)

COs	Course Outcome
1	Describe the concepts of Conventional Software Management and Software Economics for developing a software project.
2	Apply conventional and modern principles of software project management to develop the software products.
3	Illustrate the software architecture, life cycle phases and Process for a building a software product.
4	Analyze the techniques to evaluate progress of software project workflows in terms of milestones and check points, Project Organization Responsibilities and process
5	Choose the software metrics to implement a software product through process instrumentation ethical principles to be followed in management of software economics.

Open Elective Course – I
MATLAB Programming for Engineers (20A04507)

COs	Course Outcome
1	Generate arrays and matrices for numerical problems solving.
2	Represent data and solution in graphical display.
3	Interpret Numerical Methods Using MATLAB Numerical differentiation, integration, Newton Cotes integration formulae.
4	Understand Solving System of Equations Using MATLAB function fsolve.
5	Design GUI for basic mathematical applications.

Computer Networks Lab (20A05501P)

COs	Course Outcome
1	Analyze the data traffic using tools
2	Design JAVA programs for client-server communication
3	Construct a wired and wireless network using the real hardware

Artificial Intelligence Lab (20A05502P)

COs	Course Outcome
1	Explore the methods of implementing algorithms using artificial intelligence techniques.
2	Illustrate search algorithms.
3	Demonstrate building of intelligent agents.

Skill oriented course – III

Advanced Web Application Development (20A05506)

COs	Course Outcome
1	Create dynamic websites using PHP and MySQL
2	Secure Web applications from common attacks like Injection, XSS.
3	Host Websites in traditional web hosting platforms and also Cloud based infrastructure

Evaluation of Community Service Project (20A05507)

COs	Course Outcome
1	Build a solid relationship and cooperation/team work among members
2	To become more sensitive and concerned towards environment nature cleanliness
3	Apply what they have learned in "the real world"

III year II Semester Course Outcomes (R20)

Compiler Design (20A05601T)

COs	Course Outcome
1	Illustrate the process of lexical analysis
2	Analyse the syntax of program constructs
3	Illustrate the process of syntax directed translation
4	Design code generator
5	Apply code optimization techniques

Machine Learning (20A05602T)

COs	Course Outcome
1	Illustrate Data Preprocessing In Machine Learning
2	Understand the selection, evaluation and improving performance of the Model
3	Identify machine learning techniques suitable for a given problem
4	Solve the problems using various Supervised machine learning techniques
5	Design application using Unsupervised machine learning techniques

Internet of Things (20A05603T)

COs	Course Outcome
1	Understand general concepts of Internet of Things.
2	Apply design concept to IoT solutions
3	Analyze various M2M and IoT architectures
4	Evaluate design issues in IoT applications
5	Create IoT solutions using sensors, actuators and Devices

Professional Elective Course– II
Advanced Computer Architecture (20A05604b)

COs	Course Outcome
1	Demonstrate the types of computers, and new trends and developments in computer architecture
2	Outline pipelining, instruction set architectures, memory addressing
3	Illustrate Arithmatics for computers
4	Illustrate the various techniques to enhance a processors ability to exploit Instruction level parallelism (ILP), and its challenges
5	Understand Various Memories.

Open Elective Course – II
Basic VLSI Design (20A04606)

COs	Course Outcome
1	Analyze the electrical properties of MOS and BiCMOS circuits
2	Draw the Layout of simple MOS circuit using Lambda based design rules
3	Apply basic circuit concepts to MOS circuits.
4	Design digital systems using MOS circuits
5	Analyze various architectures and device technologies of PLDs

Compiler Design Lab (20A05601P)

COs	Course Outcome
1	Use LEX and YACC tools for developing a scanner and a parser
2	Design and implement LL and LR parsers
3	Design algorithms to perform code optimization in order to improve the performance of a program in terms of space and time complexity

Machine Learning Lab (20A05602P)

COs	Course Outcome
1	Understand the Mathematical and statistical prospectives of machine learning algorithms through python programming
2	Appreciate the importance of visualization in the data analytics solution.
3	Derive insights using Machine learning algorithms

Internet of Things Lab (20A05603P)

COs	Course Outcome
1	Know the various IoT sensors and understand the functionality
2	Design and analyze IoT experiments and transfer the data to IoT Clouds
3	Understand Drones and Perform Internet of Drones Experiments

Skill oriented course - IV
Soft Skills (20A52401)

COs	Course Outcome
1	Memorize various elements of effective communicative skills
2	apply critical thinking skills in problem solving
3	Judge the situation and take necessary decisions as a leader
4	Develop social and work-life skills as well as personal and emotional well-being
5	analyse the needs of an organization for team building

Mandatory Non-credit Course Intellectual Property Rights & Patents (20A99601)

COs	Course Outcome
1	Understand IPR law
2	Illustrate the copy right law
3	Illustrate Patents, Requirements, Patent Application Process and Granting of Patent
4	Discuss registration process, maintenance and litigations associated with trademarks
5	Understand Cyber law