SUMATHI REDDY
INSTITUTE OF TECHNOLOGY FOR WOMEN
L e a r n I n g   a t   i t s   b e s t
Affiliated to JNTUH, Approved by AICTE

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

List of Courses for the Academic Year 2023-24

S.No.	Year/Sem.	Course Title
1	I/I	Matrices and Calculus
2		Engineering Chemistry
3		Programming for Problem Solving
4		Basic Electrical Engineering
5		Computer Aided Engineering Graphics
6		Elements of Computer Science & Engineering
7		Engineering Chemistry Laboratory
8		Programming for Problem Solving Laboratory
9		Basic Electrical Engineering Laboratory
10	I/II	Ordinary Differential Equations and Vector Calculus
11		Applied Physics
12		Engineering Workshop
13		English for Skill Enhancement
14		Electronic Devices and Circuits
15		Applied Physics Laboratory
16		Python Programming Laboratory
17		English Language and Communication Skills Laboratory
18		IT Workshop
19	II/I	Digital Electronics
20		Data Structures
21		Computer Oriented Statistical Methods
22		Computer Organization and Architecture
23		Object Oriented Programming through Java
24		Data Structures Lab
25		Object Oriented Programming through Java Lab
26		Skill Development Course (Data Visualization - R Programming/ Power BI)
27	II/II	Discrete Mathematics
28		Business Economics And Financial Analysis
29		Operating Systems
30		Database Management Systems
31		Software Engineering
32		Operating Systems Lab

33		Database Management Systems Lab
34		Skill Development Course (Node JS/ React JS/ Django)
35	III/I	Formal Languages And Automata Theory
36		Software Engineering
37		Computer Networks
38		Web Technologies
39		Data Analytics
40		Information Retrieval Systems
41		Software Engineering Lab
42		Computer Networks And Web Technologies Lab
43		Advanced Communication Skills Lab
44	III/II	Machine Learning
45		Compiler Design
46		Design And Analysis Of Algorithms
47		Software Testing Methodologies
48		Fundamentals Of Internet Of Things
49		Machine Learning Lab
50		Compiler Design Lab
51		Software Testing Methodologies Lab
52	IV/I	Cryptography And Network Security
53		Data Mining
54		Cloud Computing
55		Internet of Things
56		Principles of Entrepreneurship
57		Cryptography and Network Security Lab
58		Industry Oriented Mini Project
59		Seminar
60		Project Stage-I
61	IV/II	Organizational Behaviour
62		Human Computer Interaction
63		Non-Conventional Sources of Energy
64		Major Project

Course Outcomes for the Academic Year 2023-24

S.NO	YEAR/SEM	COURSE NAME	COURSE OUTCOMES
1	I/I	Matrices and Calculus	1. Write the matrix representation of a set of linear equations and to analyze the solution of the system of equations
			2. Find the Eigen values and Eigen vectors
			3. Reduce the quadratic form to canonical form using orthogonal transformations.
			4. Solve the applications on the mean value theorems.
			5. Evaluate the improper integrals using Beta and Gamma functions
			6. Find the extreme values of functions of two variables with/ without constraints.
			7. Evaluate the multiple integrals and apply the concept to find areas, volumes
2	I/I	Engineering Chemistry	1. Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control.
			2. The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.
			3. They can learn the fundamentals and general properties of polymers and other engineering materials.
			4. They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.
3	I/I	Programming for Problem Solving	1. To write algorithms and to draw flowcharts for solving problems.
			2. To convert the algorithms/flowcharts to C programs.
			3. To code and test a given logic in the C programming language.
			4. To decompose a problem into functions and to develop modular reusable code.
			5. To use arrays, pointers, strings and structures to write C programs.
			6. Searching and sorting problems.
4	I/I	Basic Electrical Engineering	1. Understand and analyze basic Electrical circuits
			2. Study the working principles of Electrical Machines and Transformers
			3. Introduce components of Low Voltage Electrical Installations
5	I/I	Computer Aided Engineering Graphics	1. Apply Computer Aided drafting tools to create 2-D and 3-D objects.

			2. Sketch conics and different types of solids
			3. Appreciate the need of sectional views of solids and development of surfaces of solids
			4. Read and Interpret engineering drawings
			5. Conversion of Orthographic projection into isometric view and vice-versa manually and by using computer aided drafting
6	I/I	Elements of Computer Science and Engineering	1. Know the working principles of functional units of a basic Computer
			2. Understand program development, the use of data structures and algorithms in problem solving.
			3. Know the need and types of operating system, database systems.
			4. Understand the significance of networks, internet, WWW and cyber security
			5. Understand Autonomous systems, the application of artificial intelligence.
7	I/I	Engineering Chemistry Laboratory	1. Determination of parameters like hardness of water and rate of corrosion of mild steel in various conditions.
			2. Able to perform methods such as conductometry, potentiometry and pH metry in order to find out the concentrations or equivalence points of acids and bases.
			3. Students are able to prepare polymers like bakelite and nylon-6.
			4. Estimations saponification value, surface tension and viscosity of lubricant oils.
8	I/I	Programming For Problem Solving Laboratory	1. Formulate the algorithms for simple problems
			2. Translate given algorithms to a working and correct program
			3. Correct syntax errors as reported by the compilers
			4. Identify and correct logical errors encountered during execution
			5. Represent and manipulate data with arrays, strings and structures
			6. Use pointers of different types
			7. Create, read and write to and from simple text and binary files

			8. Modularize the code with functions so that they can be reused
9	I/I	Basic Electrical Engineering Lab	1. Verify the basic Electrical circuits through different experiments.
			2. Evaluate the performance calculations of Electrical Machines and Transformers through various testing methods.
			3. Analyze the transient responses of R, L and C circuits for different input conditions.
10	I/II	Ordinary Differential Equations and Vector Calculus	1. Identify whether the given differential equation of first order is exact or not
			2. Solve higher differential equation and apply the concept of differential equation to real world problems
			3. Use the Laplace transforms techniques for solving ODE's.
			4. Evaluate the line, surface and volume integrals and converting them from one to another
11	I/II	Applied Physics	1. Understand physical world from fundamental point of view by the concepts of Quantum mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.
			2. Identify the role of semiconductor devices in science and engineering Applications.
			3. Explore the fundamental properties of dielectric, magnetic materials and energy for their applications.
			4. Appreciate the features and applications of Nanomaterials.
			5. Understand various aspects of Lasers and Optical fiber and their applications in diverse fields.
12	I/II	Engineering Workshop	1. Study and practice on machine tools and their operations
			2. Practice on manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
			3. Identify and apply suitable tools for different trades of Engineering processes including drilling material removing, measuring, chiseling.
			4. Apply basic electrical engineering knowledge for house wiring practice.

13	I/II	English For Skill Enhancement	1. Understand the importance of vocabulary and sentence structures.
			2. Choose appropriate vocabulary and sentence structures for their oral and written communication
			3. Demonstrate their understanding of the rules of functional grammar.
			4. Develop comprehension skills from the known and unknown passages.
			5. Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts.
			6. Acquire basic proficiency in reading and writing modules of English.
14	I/II	Electronic Devices and Circuits	1. Acquire the knowledge of various electronic devices and their use on real life.
			2. Know the applications of various devices.
			3. Acquire the knowledge about the role of special purpose devices and their applications.
15	I/II	Python Programming Laboratory	1. Develop the application specific codes using python.
			2. Understand Strings, Lists, Tuples and Dictionaries in Python
			3. Verify programs using modular approach, file I/O, Python standard library
			4. Implement Digital Systems using Python
16	I/II	Applied Physics Laboratory	1. Know the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment.
			2. Appreciate quantum physics in semiconductor devices and optoelectronics.
			3. Gain the knowledge of applications of dielectric constant.
			4. Understand the variation of magnetic field and behavior of hysteresis curve.
			5. Carried out data analysis.
17	I/II	English Language and Communication Skills Laboratory	1. Understand the nuances of English language through audio- visual experience and group activities
			2. Neutralise their accent for intelligibility
			3. Speak with clarity and confidence which in turn enhances their employability skills

18	I/II	IT Workshop	1. Perform Hardware troubleshooting
			2. Understand Hardware components and inter dependencies
			3. Safeguard computer systems from viruses/worms
			4. Document/ Presentation preparation
			5. Perform calculations using spreadsheets
19	II/I	Digital Electronics	1. Ability to learn Postulates of Boolean algebra and to minimize combinational functions
			2. Ability to design and analyze combinational and sequential circuits
			3. Ability to know about the logic families and realization of logic gates.
20	II/I	Data Structures	1. Ability to select the data structures that efficiently model the information in a problem.
			2. Ability to assess efficiency trade-offs among different data structure implementations or combinations.
			3. Implement and know the application of algorithms for sorting and pattern matching.
			4. Design programs using a variety of data structures, including hash tables, binary and general tree structures, search trees, tries, heaps, graphs, and AVL-trees.
21	II/I	Computer Oriented Statistical Methods	1 .Ability to apply the concepts of probability and distributions to some case studies
			2. Ability to correlate the material of one unit to the material in other units
			3. Ability to resolve the potential misconceptions and hazards in each topic of study.
22	II/I	Computer Organization and Architecture	1. Understand the basics of instructions sets and their impact on processor design.
			2. Demonstrate an understanding of the design of the functional units of a digital computer system.
			3. Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
			4. Design a pipeline for consistent execution of instructions with Minimum hazards.
			5. Recognize and manipulate representations of numbers stored in digital computers

23	II/I	Object Oriented Programming Through Java	1. Demonstrate the behavior of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
			2. Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords
			3.Use multithreading concepts to develop inter process communication
			4. Understand the process of graphical user interface design and implementation using AWT or swings.
			5.Develop applets that interact abundantly with the client environment and deploy on the server
24	II/I	Data Structures Lab	1. Ability to develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
			2. Ability to Implement searching and sorting algorithms
25	II/I	Object Oriented Programming Through Java Lab	1. Able to write programs for solving real world problems using the java collection framework.
			2. Able to write programs using abstract classes.
			3. Able to write multithreaded programs.
			4.Able to write GUI programs using swing controls in Java.
26	II/I	Skill Development Course (Data Visualization - R Programming/ Power Bi)	1. Understand How to import data into Tableau
			2.Understand Tableau concepts of Dimensions and Measures.
			3.Develop Programs and understand how to map Visual Layouts and Graphical Properties
			4.Create a Dashboard that links multiple visualizations.
			5.Use graphical user interfaces to create Frames for providing solutions to real world problems
27	II/II	Discrete Mathematics	1. Ability to understand and construct precise mathematical proofs
			2. Ability to use logic and set theory to formulate precise statements

			3. Ability to analyze and solve counting problems on finite and discrete structures
			4. Ability to describe and manipulate sequences
			5. Ability to apply graph theory in solving computing problems
28	II/II	Business Economics And Financial Analysis	1. The students will understand the various Forms of Business and the impact of Economic variables on the Business. The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
			2. The Students can study the firm's financial position by analyzing the Financial Statements of a Company.
29	II/II	Operating Systems	1. Will be able to control access to a computer and the files that may be shared
			2. Demonstrate the knowledge of the components of computer and their respective roles in computing.
			3. Ability to recognize and resolve user problems with standard operating environments.
			4. Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
30	II/II	Database Management Systems	1.Gain knowledge of fundamentals of DBMS, database design and normal forms
			2. Master the basics of SQL for retrieval and management of data.
			3. Be acquainted with the basics of transaction processing and concurrency control.
			4.Familiarity with database storage structures and access techniques
31	II/II	Software Engineering	1. Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD).
			2. Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
			3. Will have experience and/or awareness of testing problems and will be able to develop a simple testing report

32	II/II	Operating Systems Lab	1. Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.
			2. Able to implement C programs using Unix system calls
33	II/II	Database Management Systems Lab	1. Design database schema for a given application and apply normalization
			2. Acquire skills in using SQL commands for data definition and data manipulation.
			3. Develop solutions for database applications using procedures, cursors and triggers
34	II/II	Skill Development Course (Node JS/ React JS/ Django)	1. Build a custom website with HTML, CSS, and Bootstrap and little JavaScript.
			2. Demonstrate Advanced features of JavaScript and learn about JDBC.
			3. Develop Server – side implementation using Java technologies like
			4 Develop the server – side implementation using Node JS.
			5. Design a Single Page Application using React.
35	III/I	Formal Languages And Automata Theory	1. Ability to understand the concept of abstract machines and their power to recognize the languages
			2. Ability to employ finite state machines for modeling and solving computing problems.
			3. Ability to design context free grammars for formal languages.
			4. Ability to distinguish between decidability and undecidability
36	III/I	Software Engineering	1. Ability to translate end-user requirements into system and software requirements, using e.g. UML, and structure the requirements in a Software Requirements Document (SRD)
			2. Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
			3. Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
37	III/I	Computer Networks	1. Gain the knowledge of the basic computer network technology.

			2. Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
			3. Obtain the skills of subnetting and routing mechanisms.
			4. Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.
38	III/I	Web Technologies	1. To gain knowledge of client-side scripting, validation of forms and AJAX programming
			2. To understand server-side scripting with PHP language
			3. To understand what is XML and how to parse and use XML Data with Java
			4. To introduce Server-side programming with Java Servlets and JSP
39	III/I	Data Analytics	1.Understand the impact of data analytics for business decisions and strategy
			2. Carry out data analysis/statistical analysis
			3.To carry out standard data visualization and formal inference procedures
			4.Design Data Architecture
			5.Understand various Data Sources
40	III/I	Information Retrieval Systems	1. Ability to apply IR principles to locate relevant information large collections of data
			2. Ability to design different document clustering algorithms.
			3. Implement retrieval systems for web search tasks.
			4. Design an Information Retrieval System for web search tasks
41	III/I	Software Engineering Lab	1. Ability to translate end-user requirements into system and software requirements
			2. Ability to generate a high-level design of the system from the software requirements
			3. Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
42	III/I	Computer Networks And Web Technologies Lab	1 Implement data link layer farming methods
			2 Analyze error detection and error correction codes.

			3 Implement and analyze routing and congestion issues in network design.
			4 Implement Encoding and Decoding techniques used in presentation layer
			5 To be able to work with different network tools
43	III/I	Advanced Communication Skills Lab	1. Able to acquire vocabulary and use it contextually
			2. Able to listen and speak effectively
			3. Able to develop proficiency in academic reading and writing
			4. Able to increase possibilities of job prospects
			5. Able to communicate confidently in formal and informal contexts
44	III/II	Machine Learning	1. Understand the concepts of computational intelligence like machine learning
			2. Ability to get the skill to apply machine learning techniques to address the real time problems in different areas
			3. Understand the Neural Networks and its usage in machine learning application.
45	III/II	Compiler Design	1. Demonstrate the ability to design a compiler given a set of language features.
			2. Demonstrate the knowledge of patterns, tokens & regular expressions for lexical analysis.
			3. Acquire skills in using lex tool & yacc tool for developing a scanner and parser.
			4. Design and implement LL and LR parsers
			5. Design algorithms to do code optimization in order to improve the performance of a program in terms of space and time complexity.
			6. Design algorithms to generate machine code.
46	III/II	Design and Analysis of Algorithms	1. Ability to analyze the performance of algorithms
			2. Ability to choose appropriate data structures and algorithm design methods for a specified application
			3. Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs

47	III/II	Software Testing Methodologies	1. Design and develop the best test strategies in accordance to the development model.
48	III/II	Fundamentals of Internet of Things	1. Known basic protocols in sensor networks
			2. Program and configure Arduino boards for various designs.
			3. Python programming and interfacing for Raspberry Pi.
			4. Design IoT applications in different domains.
49	III/II	Machine Learning Lab	1. Understand complexity of Machine Learning algorithms and their limitations
			2. Understand modern notions in data analysis-oriented computing
			3. Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own
			4. Be capable of performing experiments in Machine Learning using real-world data.
50	III/II	Compiler Design Lab	1. Design and develop interactive and dynamic web applications using HTML, CSS, JavaScript and XML
			2. Apply client-server principles to develop scalable and enterprise web applications.
			3. Ability to design, develop, and implement a compiler for any language.
			4. Able to use lex and yacc tools for developing a scanner and a parser
			5. Able to design and implement LL and LR parsers.
51	III/II	Software Testing Methodologies Lab	1. Design and develop the best test strategies in accordance to the development model.
52	IV/I	Cryptography And Network Security	1. Student will be able to understand basic cryptographic algorithms, message and web
			authentication and security issues.
			2. Ability to identify information system requirements for both of them such as client and server
			3. Ability to understand the current legal issues towards information security
53	IV/I	Data Mining	1. Ability to understand the types of the data to be mined and present a general

			classification of tasks and primitives to integrate a data mining system.
			2. Apply preprocessing methods for any given raw data.
			3. Extract interesting patterns from large amounts of data.
			4. Discover the role played by data mining in various fields.
			5. Choose and employ suitable data mining algorithms to build analytical applications
			6. Evaluate the accuracy of supervised and unsupervised models and algorithms.
54	IV/I	Cloud Computing	1. Ability to understand various service delivery models of a cloud computing architecture.
			2. Ability to understand the ways in which the cloud can be programmed and deployed.
			3. Understanding cloud service providers.
55	IV/I	Internet of Things	1. Interpret the impact and challenges posed by IoT networks leading to new architectural models
			2. Compare and contrast the deployment of smart objects and the technologies to connect them to network.
			3. Appraise the role of IoT protocols for efficient network communication
			4. Elaborate the need for Data Analytics and Security in IoT.
			5. Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.
56	IV/I	Principles of Entrepreneurship	1. Identify qualities of entrepreneurs
			2. Think creative and innovative
			3. Understand various schemes supporting entrepreneurship
			4. Write project proposal
57	IV/I	Cryptography and Network Security Lab	1. Student will be able to understand basic cryptographic algorithms, message and web authentication and security issues
			2. Ability to identify information system requirements for both of them such as client and server.
			3. Ability to understand the current legal issues towards information security.
58	IV/I	Industry Oriented Mini Project	1. Discover potential research areas in the field of Computer Science and Engineering

			2. Survey of several available literature in the preferred field of study and contrast the several existing solutions for research challenge
			3. Demonstrate an ability to work in teams and manage the conduct of the research study.
			4. Formulate and propose a plan for creating a solution for the research plan identified
			5. To present and report the findings of the study conducted in the preferred domain
59	IV/I	Seminar	1. Recall the knowledge in basic engineering Courses.
			2. Prepare the report of technical seminar
			3. Develop professional skills and communication skills.
			4. Explain existed methodology
			5. Assess the understanding ability in core Courses.
60	IV/I	Project Stage-I	1. Identify the problem by applying acquired knowledge.
			2. Analyze and categorize executable project modules after considering risks.
			3. Choose efficient tools for designing project modules.
			4. Combine all the modules through effective team work after efficient testing.
			5. Elaborate the completed task and compile the project report.
61	IV/II	Organizational Behaviour	1. To learn the conceptual framework of environmental and organizational context of organizational behavior.
			2. To study the personality, attitude, perception and to motivate employees towards organizational commitment.
			3. To understand the communication, decision making process and stress and conflict management in the organization.
62	IV/II	Human Computer Interaction	1. Ability to apply HCI and principles to interaction design.
			2. Ability to design certain tools for blind or PH people.
63	IV/II	Non-Conventional Sources of Energy	1. Identify renewable energy sources and their utilization. Understand the basic concepts of solar radiation and analyze the working of solar and thermal systems
			2. Understand principles of energy conversion from alternate sources

			including wind, geothermal, ocean, biomass, biogas and hydrogen
			3. Understand the concepts and applications of fuel cells, thermoelectric convertor and MHD generator.
			4. Identify methods of energy storage for specific applications
64	IV/II	Major Project	1. Identify the problem by applying acquired knowledge.
			2. Analyze and categorize executable project modules after considering risks.
			3. Choose efficient tools for designing project modules.
			4. Combine all the modules through effective team work after efficient testing.
			5. Elaborate the completed task and compile the project report.