



**Department of Computer Science and Engineering**  
**Course Outcomes**

**Regulation:MLRS-R19**

At the end of the course, the students will be able to:

S.No	Course Name & Code	Year/Sem	COURSE OUTCOMES
1	Mathematics-I 1910001	C111.1	Solve a system of linear equations by representing them in matrix form and analyze its solution.
		C111.2	Optimize single and multivariable functions by using the methods of differential calculus.
		C111.3	Evaluate improper integrals using Beta and Gamma functions and find the area and volume of various regions using double and triple integrals.
		C111.4	Solve certain Ordinary Differential Equations using Laplace transform and transform functions on time domain to frequency domain
		C111.5	Understand the methods of differential calculus to optimize single and multivariable functions and convert line integrals to area integrals and surface integrals to volume integrals.
2	Chemistry 1910008	C112.1	Apply the concept of electro chemistry, corrosion and corrosion protection methods
		C112.2	Understand polymers, plastics, fibers, cement and nano materials for various applications.
		C112.3	Identify appropriate method of water purification and pure water for domestic and industrial utilization and choose suitable energy source for their applications in the economic growth of nation.
		C112.4	Understand the concepts of phase rule and surface chemistry.
		C112.5	Demonstrate awareness and understanding of the skills necessary to live and work in a diverse engineering world.
3	Basic Electrical Engineering	C113.1	Design a system, component, or process to meet desired needs within realistic NA Constraints such as economic, environmental, social,

			political, ethical, health and safety, Manufacturability and sustainability
		<b>C113.2</b>	Analysis of Resistive Circuits and Solution of resistive circuits with independent sources
		<b>C113.3</b>	Acquire the knowledge about the characteristics and working principles of semiconductor diodes, Bipolar Junction Transistor. To get an insight about the basic introduction of Digital electronics.
		<b>C113.4</b>	Evaluate the breadth of electrical engineering, Acquire knowledge about battery technology.
		<b>C113.5</b>	Understand 3 phase balanced and unbalanced, star and delta connected supply and load and to measure power in 3 phase circuits.
4	<b>Engineering Workshop 1910372</b>	<b>C114.1</b>	Understand the basic manufacturing processes of Casting, Joining, Forming and machining through hands on experience and use of hand tools
		<b>C114.2</b>	Describe the properties of different materials- metals and nonmetals.
		<b>C114.3</b>	Interpret the various measuring devices and to know about the importance of sequential plans of action in manufacturing through practice in various sections and acquire knowledge about electronic components
		<b>C114.4</b>	Acquire knowledge about soldering tools & components
		<b>C114.5</b>	Estimate the PCB soldering, household electronic appliances with cost.
5	<b>English 1910009</b>	<b>C115.1</b>	Communicate effectively in both verbal and written visual, and no verbal modes, using concrete support and conventional language.
		<b>C115.2</b>	Demonstrate knowledge of professional and ethical responsibilities.
		<b>C115.3</b>	Develop presentation skills, communication skills and apply the marvels of technology and engineering to check counterfeiting the currency notes and design authentic polymer notes
		<b>C115.4</b>	Recognize the affects and effects of risk and disaster management.
		<b>C115.5</b>	Develop interview skills
6	<b>Engineering Chemistry Lab 1910073</b>	<b>C116.1</b>	Determination of parameters like hardness and chloride content in water.
		<b>C116.2</b>	Estimation of rate constant of a reaction from concentration – time relationships.

		<b>C116.3</b>	Determination of physical properties like adsorption and viscosity and calculate Rf values of some organic molecules by TLC technique.
		<b>C116.4</b>	Demonstrate the analytical techniques, analysis of organic substances and chemical synthesis. Both quantitative and qualitative methods are emphasized.
		<b>C116.5</b>	Develop experimental skills to design new experiments in Engineering.
7	<b>English Language and Communication Skills Lab 1910074</b>	<b>C117.1</b>	Gain the knowledge about the correct usage of English with an emphasis on reading skills in order to be able to study effectively & think logically.
		<b>C117.2</b>	Acquire enough English skills to further their study at advanced levels.
		<b>C117.3</b>	Communicate well and it will be helpful in getting placements and Develop presentation skills, communication skills.
		<b>C117.4</b>	Apply the marvels of technology and engineering to check counterfeiting the currency notes and design authentic polymer notes.
		<b>C117.5</b>	Develop the interview skills and participate in group discussions effectively.
8	<b>Basic Electrical Engineering Lab 1910271</b>	<b>C118.1</b>	Infer different meters and instruments for measurement of electrical quantities
		<b>C118.2</b>	Understand the linear and nonlinear characteristics of different types of loads experimentally
		<b>C118.3</b>	Design and experiment potential divider circuits and experimentally verify the basic circuit theorems
		<b>C118.4</b>	Understand three-phase balanced and unbalanced, star and delta connected supply and load and to measure power in 3 phase circuits
		<b>C118.5</b>	Measure power and power factor in ac circuits
	<b>1-2</b>		
9	<b>Mathematics – II 1920002</b>	<b>C121.1</b>	Identify whether the given differential equation of first order is exact or not
		<b>C121.2</b>	Solve higher order differential equations.
		<b>C121.3</b>	Evaluate the multiple integrals and apply the concept to find areas, volumes and also evaluate the line, surface and volume integrals and converting them from one to another

		<b>C121.4</b>	Apply the concept of differential equation to real world problems
		<b>C121.5</b>	Understand basic properties of vector valued functions and their applications to line, surface and volume integrals
10	<b>Applied Physics 1920008</b>	<b>C122.1</b>	Differentiate between materials on the basis of their structure, how to defect a material and their effects
		<b>C122.2</b>	Understand the electrical properties of solids and to derive their wave functions
		<b>C122.3</b>	Analyze the types of semi-conductors and diodes and analyze of dielectric and magnetic Materials
		<b>C122.4</b>	Identify the requirements of a building for clear audibility, fabrication process of nano-materials and their applications.
		<b>C122.5</b>	Develop problem solving skills and analytical skills.
11	<b>Programming for Problem Solving 19200501</b>	<b>C123.1</b>	Explain the basics of computer hardware and software.
		<b>C123.2</b>	Understand various steps in program development and basic concepts in C Language
		<b>C123.3</b>	Develop modular programming using functions, arrays and pointers to solve matrices problems.
		<b>C123.4</b>	Analyze heterogeneous data using structures and handle large amount of I/O information using files
		<b>C123.5</b>	Apply effective searching and sorting techniques based on time complexities.
12	<b>Engineering Graphics 1920371</b>	<b>C124.1</b>	Understand the fundamental concepts of engineering drawing.
		<b>C124.2</b>	Draw engineering curves, and to construct various types of scales.
		<b>C124.3</b>	Understand the concepts of projection of points, lines and planes in various angles of projection and in different types of projection.
		<b>C124.4</b>	Draw the interpenetration of solids, their curves of intersection in various types of projections
		<b>C124.5</b>	Apply the fundamental concepts of engineering drawing to draw engineering curves, and to construct various types of scales.
13	<b>Applied Physics Lab 1920072</b>	<b>C125.1</b>	Understand the principles of motion of a particle, mechanical energy
		<b>C125.2</b>	Understand the principles of Newton's Laws of Motion
		<b>C125.3</b>	Acquire knowledge on Circular Motion, Work Energy and Power, Elastic Properties of Materials, Heat, Temperature
		<b>C125.4</b>	Analysis of Electric Forces, Fields and Potentials.
		<b>C125.5</b>	Develop experimental skills to design new experiments in Engineering.
14	<b>Programming for Problem Solving Lab 1920571</b>	<b>C126.1</b>	Create the algorithms for simple problems
		<b>C126.2</b>	Translate given algorithms to a working and correct program
		<b>C126.3</b>	Develop programs to solve basic problems by understanding basic concepts in C like operators, control statements.

		<b>C126.4</b>	Write C program to represent and manipulate data with arrays, strings and structures
		<b>C126.5</b>	Create, read and write to and from simple text and binary files
15	<b>Environmental Science 1920021</b>	<b>C127.1</b>	Understand technologies on the basis of ecological principles
		<b>C127.2</b>	Develop environmental regulations, which in turn help in sustainable development.
		<b>C127.3</b>	Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.
		<b>C127.4</b>	Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
		<b>C127.5</b>	Demonstrate proficiency in quantitative methods, qualitative analysis, critical thinking, and written and oral communication needed to conduct high-level work as interdisciplinary scholars and/or practitioners.
	<b>2-1</b>		
16	<b>Analog and Digital Electronics 1930405</b>	<b>C211.1</b>	Infer the characteristics of various components.
		<b>C211.2</b>	Understand the utilization of components.
		<b>C211.3</b>	Design and analyze small signal amplifier circuits and Minimize combinational functions and postulates of Boolean algebra
		<b>C211.4</b>	Design and analyze combinational and sequential circuits
		<b>C211.5</b>	Understands about the logic families and realization of logic gates.
17	<b>Data Structures 1930511</b>	<b>C212.1</b>	Understand the basic concepts of algorithms, performance of algorithms, symbolic notations.
		<b>C212.2</b>	Design the concepts of abstract data types of linear and non linear structures.
		<b>C212.3</b>	Analyze the functionalities and representations of linear and non linear data structures and apply the various searching and sorting algorithms to real world applications.
		<b>C212.4</b>	Infer the behavior of binary trees.

		<b>C212.5</b>	Write programs in C to solve problems using DS and choose appropriate DS to specific application.
18	<b>Computer Oriented Statistical Methods</b> 19302512	<b>C213.1</b>	Write programs in C to solve problems using DS and choose appropriate DS to specific application.
		<b>C213.2</b>	Apply the concepts of probability and distributions to some case studies
		<b>C213.3</b>	Analyze sampling theory and testing of hypothesis and making inferences and implement and correlate the material of one unit to the material in other units.
		<b>C213.4</b>	Understand probability distributions of single and multiple random variables.
		<b>C213.5</b>	Understand Stochastic process and Markov chains.
19	<b>Computer Organization and Architecture</b> 19305013	<b>C214.1</b>	Understand the basics of instructions sets and their impact on processor design.
		<b>C214.2</b>	Demonstrate an understanding of the design of the functional units of a digital computer system.
		<b>C214.3</b>	Evaluate cost performance and design trade-offs in designing and construct a computer processor including memory
		<b>C214.4</b>	Design a pipeline for consistent execution of instructions with minimum hazards.
		<b>C214.5</b>	Recognize and manipulate representations of numbers stored in digital computers
20	<b>Object Oriented Programming using C++</b> 1930514	<b>C215.1</b>	Develop programs with reusability.
		<b>C215.2</b>	Understand principles of data abstraction, inheritance and polymorphism.
		<b>C215.3</b>	Create the base and derived class using inheritance feature of C++
		<b>C215.4</b>	Handle exceptions in programming
		<b>C215.5</b>	Develop applications for a range of problems using object-oriented programming techniques
21	<b>Analog and Digital Electronics Lab</b> 1930475	<b>C216.1</b>	Identify the characteristics of various components.
		<b>C216.2</b>	Understand the utilization of components.
		<b>C216.3</b>	Design and analyze small signal amplifier circuits using Boolean

			algebra and minimize combinational functions
		<b>C216.4</b>	Design and analyze combinational and sequential circuits
		<b>C216.5</b>	Infer the logic families and realization of logic gates.
22	<b>Data Structures Lab 1930572</b>	<b>C217.1</b>	Develop C programs for computing and real-life applications using basic elements like control statements, arrays, functions, pointers and strings,
		<b>C217.2</b>	Understand the difference between linear and non linear data structures.
		<b>C217.3</b>	Select appropriate data structure based on the real time scenario.
		<b>C217.4</b>	Implement searching and sorting algorithms
		<b>C217.5</b>	Implement different graph traversal methods.
23	<b>IT Workshop Lab 1930573</b>	<b>C218.1</b>	Differentiate between Hardware and Software components of Computer.
		<b>C218.2</b>	Understand the architectural overview of computer.
		<b>C218.3</b>	Apply tools for preparation of documents, presentations and data sheets and can Implement the knowledge for installation of different operating systems and their commands
		<b>C218.4</b>	Configure and mount different peripherals on CPU and helpful in understanding, presenting and designing various CSE subjects.
		<b>C218.5</b>	Perform trouble shooting of the components of PC.
24	<b>C++ Programming Lab 1930574</b>	<b>C219.1</b>	Understand object-oriented programming concepts using the C++ language.
		<b>C219.2</b>	Implement the principles of data abstraction, inheritance and polymorphism
		<b>C219.3</b>	Develop programs using the principles of virtual functions and polymorphism.
		<b>C219.4</b>	Implement exception handling techniques
		<b>C219.5</b>	Develop applications for a range of problems using object-oriented programming techniques.
25	<b>Gender Sensitizati on Lab 1930022</b>	<b>C2110.1</b>	Understanding the important issues related to gender in contemporary India.
		<b>C2110.2</b>	Sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender.

		<b>C2110.3</b>	Attain a finer grasp of how gender discrimination works in our society and how to counter it.
		<b>C2110.4</b>	Develop a sense of appreciation of women in all walks of life.
		<b>C2110.5</b>	Understand and respond to gender violence
	<b>2-2</b>		
26	<b>Discrete Mathematics 1940515</b>	<b>C221.1</b>	Construct precise mathematical proofs
		<b>C221.2</b>	Use logic and set theory to formulate precise statements
		<b>C221.3</b>	Analyze and solve counting problems on finite and discrete structures
		<b>C221.4</b>	Apply graph theory in solving computing problems
		<b>C221.5</b>	Understand the elementary discrete mathematics for computer science and engineering.
27	<b>Business Economics &amp; Financial Analysis 1940010</b>	<b>C222.1</b>	Understand the various Forms of Business and the impact of economic variables on the Business.
		<b>C222.2</b>	Analyze the demand, supply for the business
		<b>C222.3</b>	Understand the different type of production function and Identify the impact of the Economy on Business and Firms specifically.
		<b>C222.4</b>	Analyze the Business from the Financial Perspective.
		<b>C222.5</b>	Understand the firm's financial position by analyzing the Financial Statements of a Company.
28	<b>Operating Systems 1940516</b>	<b>C223.1</b>	Infer the issues to be considered in the design and development of operating system
		<b>C223.2</b>	Demonstrate the usage of Unix commands, system call interface for process management, interprocess communication and I/O in Unix
		<b>C223.3</b>	Create control access to a computer and the files that shared
		<b>C223.4</b>	Resolve user problems with standard operating environments.



		<b>C223.5</b>	Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
29	<b>Database Management Systems 1940517</b>	<b>C224.1</b>	Understand the basics of SQL and construct queries using SQL.
		<b>C224.2</b>	Understand the topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.
		<b>C224.3</b>	Gain knowledge of fundamentals of DBMS, database design and normal forms
		<b>C224.4</b>	Design the database with transaction processing and concurrency control.
		<b>C224.5</b>	Infer the database storage structures and access technique
30	<b>Java Programming 1940518</b>	<b>C225.1</b>	Solve real world problems using OOP techniques.
		<b>C225.2</b>	Understand the use of abstract classes.
		<b>C225.3</b>	Solve problems using java collection framework and I/O classes and can develop multithreaded applications with synchronization
		<b>C225.4</b>	Develop applets for web application
		<b>C225.5</b>	Design GUI based applications
31	<b>Operating Systems Lab 19404075</b>	<b>C226.1</b>	Understand the design aspects of operating system concepts through simulation
		<b>C226.2</b>	Use basic Unix commands, system call interface for process management
		<b>C226.3</b>	Implement interprocess communication and I/O in Unix and implement operating system concepts such as scheduling, deadlock management
		<b>C226.4</b>	Simulate and implement operating system file management and memory management.
		<b>C226.5</b>	Implement C programs using Unix system calls.
32	<b>Database Management Systems Lab</b>	<b>C227.1</b>	Design database schema for a given application
		<b>C227.2</b>	Apply normalization for the given database

		<b>C227.3</b>	Acquire skills in using SQL commands for data definition and can apply DDL and DML commands on the relational table
		<b>C227.4</b>	Develop solutions for database applications using procedures and triggers
		<b>C227.5</b>	Create the application where cursors improve the response time.
33	<b>Java Programming Lab 1940577</b>	<b>C228.1</b>	Compile programs in java compiler and eclipse platform.
		<b>C228.2</b>	Write programs for solving real world problems using java collection frame work.
		<b>C228.3</b>	Write programs using abstract classes and multithreaded programs
		<b>C228.4</b>	Write GUI programs using swing controls in Java.
		<b>C228.5</b>	Develop applications with java programming.
34	<b>Constitution of India 1940023</b>	<b>C229.1</b>	Understand the constitution law and constitutionalism
		<b>C229.2</b>	Understand Historical perspective of the Constitution of India
		<b>C229.3</b>	Understand Scheme of the fundamental rights and state Salient features and characteristics of theConstitution of India.
		<b>C229.4</b>	Gain Knowledge on the scheme of the Fundamental Duties and its legal status
		<b>C229.5</b>	Understand the Directive Principles of State Policy, its importance and implement them.
	<b>3-1</b>		
35	<b>Formal Languages &amp; Automata Theory 1950519</b>	<b>C311.1</b>	Understand the mathematical principles behind theoretical computer science.
		<b>C311.2</b>	Differentiate and give examples for the different types of automata like finite automata, push down automata, linear bounded automata and Turing machine.
		<b>C311.3</b>	Correlate the different types of automata to real world applications and design appropriate automata for the different requirements outlined by theoretical computer science.
		<b>C311.4</b>	Identify the different computational Problems and their associated complexity.

		<b>C311.5</b>	Distinguish between decidability and undecidability.
36	<b>Software Engineering 1950520</b>	<b>C312.1</b>	Translate end-user requirements into system and software requirements
		<b>C312.2</b>	Understand structure the requirements in a Software Requirements Document (SRD).
		<b>C312.3</b>	Identify and apply appropriate software architectures and can assessment of the problem
		<b>C312.4</b>	Develop a simple testing report
		<b>C312.5</b>	Design the high level design of a system and be able to critically compare alternative choices.
37	<b>Computer Networks 1950521</b>	<b>C313.1</b>	Understand the concepts and fundamentals of computer networks physical layer.
		<b>C313.2</b>	Infer the standard models for the layered approach to communication between machines in a network.
		<b>C313.3</b>	Gain the knowledge of the network layer in OSI model and obtain the skills of subnetting and routing mechanisms
		<b>C313.4</b>	Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
		<b>C313.5</b>	Design network with the essential protocols of computer networks
38	<b>Web Technologies 1950522</b>	<b>C314.1</b>	Gain knowledge of client-side scripting, validation of forms and AJAX programming
		<b>C314.2</b>	Understand what is XML and how to parse and use XML Data with Java
		<b>C314.3</b>	Understand the Common Gateway Interface and life cycle of Servlets
		<b>C314.4</b>	Design dynamic web page using PHP language for server-side scripting
		<b>C314.5</b>	Develop Client-side scripting with Javascript language.

39	<b>Principles of Programming Language (PE-I)</b> 1950545	<b>C315.1</b>	Design expressing syntax and semantics in formal notation
		<b>C315.2</b>	Identify and apply a suitable programming paradigm for a given computing application
		<b>C315.3</b>	Gain knowledge of and able to compare the features of various programming languages
		<b>C315.4</b>	Infer the Concept of high-level language design and implementation
		<b>C315.5</b>	Understand different programming paradigms
40	<b>Informational Retrieval Systems (PE-II)</b> 19502548	<b>C316.1</b>	Apply IR principles to locate relevant information large collections of data
		<b>C316.2</b>	Design different document clustering algorithms
		<b>C316.3</b>	Implement retrieval systems for web search tasks and can Understand the important concepts and algorithms in IRS
		<b>C316.4</b>	Understand the data/file structures that are necessary to design, and implement information retrieval (IR) systems
		<b>C316.5</b>	Design an Information Retrieval System for web search tasks.
41	<b>Software Engineering Lab</b> 1950578	<b>C317.1</b>	Develop software project by using various software engineering principles
		<b>C317.2</b>	Solve methods in each of the phases of software development.
		<b>C317.3</b>	Translate end-user requirements into system and software requirements and generate a high-level design of the system from the software requirements
		<b>C317.4</b>	Apply testing tools and techniques to debug problems in the project
		<b>C317.5</b>	Develop simple testing report
42	<b>Computer Networks &amp; Web Technologies Lab</b> 1950579	<b>C318.1</b>	Implement data link layer framing methods
		<b>C318.2</b>	Analyze error detection and error correction codes.
		<b>C318.3</b>	Implement and analyze routing and congestion issues in network design. Encoding and Decoding techniques used in presentation layer
		<b>C318.4</b>	Utilize different network tools for maintenance of networks

		<b>C318.5</b>	Analyze the traffic flow and the contents of protocol frames
43	<b>Advanced Communication Skills Lab</b> 1950075	<b>C319.1</b>	Gathering ideas and information to organize ideas relevantly and coherently.
		<b>C319.2</b>	Engaging in debates
		<b>C319.3</b>	Participate in group discussions and develop the skill to face interviews.
		<b>C319.4</b>	Writing project/research reports/technical reports.
		<b>C319.5</b>	Prepare oral presentations.
44	<b>Intellectual Property Rights</b> 1950024	<b>C3110.1</b>	Identify different types of Intellectual Properties (IPs), the right of ownership, scope of protection as well as the ways to create and to extract value from IP.
		<b>C3110.2</b>	Recognize the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development.
		<b>C3110.3</b>	Identify activities and constitute IP infringements and the remedies available to the IP owner to prevent infringement of proprietary rights in products and technology development.
		<b>C3110.4</b>	Identify critical analysis arguments relating to the development and reform of intellectual property right institutions
		<b>C3110.5</b>	Demonstrate a capacity to identify, apply and assess ownership rights and marketing protection under intellectual property law as applicable to information, ideas, new products and product marketing
	<b>3-2</b>		
45	<b>Machine Learning</b> 1950523	<b>C321.1</b>	Understand the concepts of computational intelligence like machine learning
		<b>C321.2</b>	Gain skill to apply machine learning techniques to address the real time problems in different areas
		<b>C321.3</b>	Understand the Neural Networks and its usage in machine learning application.
		<b>C321.4</b>	Understand computational learning theory
		<b>C321.5</b>	Demonstrate the pattern comparison techniques

46	<b>Compiler Design</b> 1950524	<b>C322.1</b>	Demonstrate the ability to design a compiler given a set of language features.
		<b>C322.2</b>	Demonstrate the knowledge of patterns, tokens & regular expressions for lexical analysis.
		<b>C322.3</b>	Use lex tool & yacc tool for developing a scanner and parser.
		<b>C322.4</b>	Design algorithms to do code optimization in order to improve the performance of a program in terms of space and time complexity.
		<b>C322.5</b>	Design algorithms to generate machine code.
47	<b>Design and Analysis of Algorithms</b> 1950525	<b>C323.1</b>	Analyze the performance of algorithms
		<b>C323.2</b>	Choose appropriate data structures and algorithm design methods for a specified application
		<b>C323.3</b>	Understand how the choice of data structures and the algorithm design methods impact the performance of programs
		<b>C323.4</b>	Describes how to evaluate and compare different algorithms using worst-, average-, and bestcase analysis
		<b>C323.5</b>	Write the notations for analysis of the performance of algorithms
48	<b>SOFTWARE TESTING METHODOLOGIES</b> 1950655	<b>C324.1</b>	Understand basics of Software Testing Methodologies.
		<b>C324.2</b>	Distinguish characteristics of structural testing methods.
		<b>C324.3</b>	Demonstrate the integration testing which aims to uncover interaction and compatibility problems as early as possible
		<b>C324.4</b>	Discuss about the functional and system testing methods.
		<b>C324.5</b>	List a range of different software testing techniques and strategies and be able to apply specific(automated) unit testing method to the projects.
49	<b>DISASTER PREPAREDNESS &amp; PLANNING MANAGEMENT</b> <b>Open Elective-I</b>	<b>C325.1</b>	Understanding foundations of hazards, disasters and associated natural/social phenomena
		<b>C325.2</b>	Explain the disaster management theory
		<b>C325.3</b>	Infer the methods of community involvement as an essential part of successful DRR and Identify Humanitarian Assistance before and after disaster

		<b>C325.4</b>	Apply the technological innovations in Disaster Risk Reduction
		<b>C325.5</b>	Experience on conducting independent DM study including data search, analysis and presentation of disaster case study
50	<b>Machine Learning Lab 1950580</b>	<b>C326.1</b>	Understand complexity of Machine Learning algorithms and their limitations
		<b>C326.2</b>	Understand modern notions in data analysis-oriented computing
		<b>C326.3</b>	Apply common Machine Learning algorithms in practice and implementing their own;
		<b>C326.4</b>	Extract the data from database using python
		<b>C326.5</b>	Implement k-nearest neighbors classification using python
51	<b>Compiler Design Lab 1950581</b>	<b>C327.1</b>	Design and develop interactive and dynamic web applications using HTML, CSS, JavaScript and XML
		<b>C327.2</b>	Apply client-server principles to develop scalable and enterprise web application
		<b>C327.3</b>	Design, develops, and implements compiler for any language and can utilize lex and yacc tools for developing a scanner and a parser.
		<b>C327.4</b>	Design and implement LL and LR parsers.
		<b>C327.5</b>	Design of top-down and bottom-up parsers.
52	<b>SOFTWARE TESTING METHODOLOGIES LAB 1950582</b>	<b>C328.1</b>	Understand basics of Software Testing Methodologies.
		<b>C328.2</b>	Develop skills in software test automation and management using latest tools
		<b>C328.3</b>	Design and develop the best test strategies in accordance to the development model
		<b>C328.4</b>	Develop test case and test plan document for banking application.
		<b>C328.5</b>	Discuss about the functional and system testing methods
53	<b>Envir onme ntal Scien ce</b>	<b>C329.1</b>	Understanding the importance of ecological balance for sustainable development.

		<b>C329.2</b>	Understanding the impacts of developmental activities and mitigation measures
		<b>C329.3</b>	Understanding the environmental policies and regulations.
		<b>C329.4</b>	Evaluate technologies on the basis of Environmental regulations.
		<b>C329.5</b>	Analyze the problems related to environmental pollution and management.
	<b>4-1</b>	4-1	
54	<b>Cryptography &amp; Network Security</b>	<b>C411.1</b>	Understand basic cryptographic algorithms, message and web authentication and security issues
		<b>C411.2</b>	Identify information system requirements for both of them such as client and server.
		<b>C411.3</b>	Understand the current legal issues towards information security and can explain the importance and application of each of confidentiality, integrity, authentication and availability
		<b>C411.4</b>	Generate and distribute a PGP key pair and use the PGP package to send an encrypted email message
		<b>C411.5</b>	Discuss Web security and Firewalls
55	<b>Data Mining</b>	<b>C412.1</b>	Understand the types of the data to be mined and present a general classification of tasks and primitives to integrate a data mining system
		<b>C412.2</b>	Apply preprocessing methods for any given raw data.
		<b>C412.3</b>	Extract interesting patterns from large amounts of data and can discover the role played by data mining in various fields
		<b>C412.4</b>	Choose and employ suitable data mining algorithms to build analytical applications
		<b>C412.5</b>	Evaluate the accuracy of supervised and unsupervised models and algorithms.
56	<b>CLOUD COMPUTING (PE-IV)</b>	<b>C413.1</b>	Discuss the various paradigm of cloud computing and articulate the main concepts, key technologies, strengths, and limitations of cloud computing
		<b>C413.2</b>	Identify the architecture and infrastructure of cloud computing suitable for the specified environment
		<b>C413.3</b>	Interpret various data, scalability and cloud services to acquire efficient database for cloud storage.



		<b>C413.4</b>	Explain the security, privacy, and interoperability of cloud computing with its controlling mechanism
		<b>C413.5</b>	Construct the cloud to utilize for the real-world applications.
57	<b>REAL TIME SYSTEMS (PE-V)</b>	<b>C414.1</b>	Explain real-time concepts such as preemptive multitasking, task priorities, priority inversions and so on
		<b>C414.2</b>	Describe how a real-time operating system kernel is implemented
		<b>C414.3</b>	Intercept how tasks are managed and can explain how the real-time operating system implements time management.
		<b>C414.4</b>	Discuss Inter process communicate using semaphores, mailboxes, and queues.
		<b>C414.5</b>	Understand real time operating systems like RT Linux, Vx Works, MicroC /OSII, Tiny Os
58	<b>Principles of Entrepreneurship (Open Elective - II)</b>	<b>C415.1</b>	Understand entrepreneurship definitions and different views of entrepreneurship
		<b>C415.2</b>	Apply approaches for generating new business ideas
		<b>C415.3</b>	Understand the methodology for business model formation.
		<b>C415.4</b>	Apply critical evaluation of business cases in entrepreneurship
		<b>C415.5</b>	Determine own suggestions for improving entrepreneurial practice
59	<b>Cryptography &amp; Network Security Lab</b>	<b>C416.1</b>	Apply the concepts of AND OR and XOR each character in this string and displayay the result.
		<b>C416.2</b>	Design a Java program to perform encryption and decryption using the following algorithms
		<b>C416.3</b>	Demonstrate a C/JAVA program to implement the DES algorithm logic and can determine the methods to create a C/JAVA program to implement the Blowfish algorithm logic
		<b>C416.4</b>	Identify the commonly used operations involving the RC4 logic in Java Using Java cryptography; encrypt the text “Hello world” using Blowfish. Create your own key using Java key tool.
		<b>C416.5</b>	Build exemplary applications related to the Diffie-Hellman Key
60	<b>Ind ustr ial Ori ente</b>	<b>C417.1</b>	Understand the problem definition and gather the requirements of the problem.

		<b>C417.2</b>	Analyze the design and develop the application tool with the learned technologies.
		<b>C417.3</b>	Ability to initiate efforts to solve real time problems.
		<b>C417.4</b>	Develop different real time applications and can Implement new techniques and technologies.
		<b>C417.5</b>	Solve the challenges in real time applications.
61	<b>Seminar</b>	<b>C418.1</b>	Analyze a current topic of professional interest and present it before an audience.
		<b>C418.2</b>	Gain knowledge on approaching engineering problems and providing effective and efficient solutions to solve it
		<b>C418.3</b>	Interact with subject experts, knowledge engineers and peer groups for dissemination of knowledge.
		<b>C418.4</b>	Gain Confidence to take on technical challenges and providing solutions for real world problems.
62	<b>Project Stage-1</b>	<b>C419.1</b>	Identify the requirements of the project.
		<b>C419.2</b>	Plan the schedule and budget required for project development
		<b>C419.3</b>	Utilize the application tool with the learned technologies and develop the real-time applications.
		<b>C419.4</b>	Analysis the performance of the application
		<b>C419.5</b>	Prepare the document for the project developed
	<b>4-2</b>	<b>4-2</b>	
63	<b>Organizational Behaviour</b>	<b>C421.1</b>	Plan an organizational structure for a given context in the organization and carry out production operations through work study
		<b>C421.2</b>	Understand the markets, customers and competition better and price the given products appropriately.
		<b>C421.3</b>	Ensure quality for a given product or service and plan and control the HR function better

		<b>C421.4</b>	Plan, schedule and control projects through PERT and CPM
		<b>C421.5</b>	Evolve a strategy for a business or service organization
64	<b>HUMAN COMPUTER INTERACTION</b> Professional Elective – VI	<b>C422.1</b>	Apply HCI and principles to interaction design.
		<b>C422.2</b>	Design certain tools for blind or PH people.
		<b>C422.3</b>	Identify and formulate characteristics and components of graphical user interface and can analyze & implement various design paradigms for human computer interaction.
		<b>C422.4</b>	Apply the navigation schemes through window, device and screen-based controls
		<b>C422.5</b>	Utilize HCI in the software process
65	<b>Environmental Impact Assessment(Open Elective – III)</b>	<b>C423.1</b>	Infer the multidisciplinary nature of environment
		<b>C423.2</b>	Understand the essence of environment, biodiversity and its Conservation.
		<b>C423.3</b>	Identify the natural resources and their protection and causes and effects of environmental pollution as well as environmental issues
		<b>C423.4</b>	Understand management of environmental wastes, disasters and rules, regulations, policies for the protection of environment.
		<b>C423.5</b>	Identify the sustainable development and natural functioning of ecosystems
66	<b>Project Stage – II</b>	<b>C424.1</b>	Identify the requirements of the project.
		<b>C424.2</b>	Plan the schedule and budget required for project development
		<b>C424.3</b>	Utilize the application tool with the learned technologies.
		<b>C424.4</b>	Develop the real-time applications and analysis the performance of the application
		<b>C424.5</b>	Prepare the document for the project developed