DEPT. OF COMPUTER SCIENCE & ENGINEERING(Data Science)

R-18 COURSE OUTCOMES

S. No	CLASS	REGULATION	Subject	Course Code	CO's	Course Oucomes
1	I/I	R-18	Mathematics - I	MA101BS	CO-1	Apply the matrix representation of a set of linear equations and to analyse the solution of the system of equations
					CO-2	Able to use the Eigen values and Eigen vectors. Reduce the quadratic form to canonical form using orthogonal transformations
					CO-3	Analyze the nature of sequence and series.
					CO-4	Solve the applications on the mean value theorems. Evaluate the improper integrals using Beta and Gamma functions
					CO-5	Estimate the extreme values of functions of two variables with/ without constraints.
2	I/I	R-18	Chemistry	CH102BS	CO-1	Describe The knowledge of atomic, molecular and electronic changes, band theory related to conductivity
					CO-2	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost
					CO-3	Apply The required principles and concepts of electrochemistry, corrosion and inunderstanding the problem of water and its treatments. electron chemistry
					CO-4	Analyse The knowledge of confrontational and confirmation analysis of molecules and reaction mechanisms
					CO-5	Explain concepts on basic spectroscopy and application to medical and other fields
3	I/I	R-18	Basic Electrical Engineering	EE103ES	CO-1	Analyze and solve electrical circuits using network theorems.
					CO-2	construct and analyze simple AC circuits
					CO-3	Analyze single phase and three phase transformer
					CO-4	Construct and analyze the working principles of Electrical Machines
					CO-5	Investigate the knowledge on batteries and Protective Equipment's.
4	I/I	R-18	Engineering Workshop	ME105ES	CO-1	Able to Study and practice on machine tools and their operations
					CO-2	Analyze manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding.
					CO-3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.
					CO-4	Apply basic electrical engineering knowledge for house wiring practice.
					CO-5	Ability to design and model different Prototypes in the Carpentry Trade Such as cross Lap Joint and Dovetail Joint.
5	I/I	R-18	English	EN105HS	CO-1	Use English Language effectively in spoken and written forms.
					CO-2	Intrupt the given text sand respond appropriately.
					CO-3	Demonstrate confidently in various contexts and different cultures.
					CO-4	Execute basic proficiency in English including reading and listening comprehension, writing and speaking skills.
					CO-5	Apply new oral vocabulary words in context to reinforce meaning.

6	I/I	R-18	Engineering Chemistry Lab	CH106BS	CO-1	Apply the method like hardness of water and rate of corrosion of mild steel in various conditions.
					CO-2	Students are analyzing the various water samples with different methods and various water treatment methods for industrial usages.
					CO-3	Students are able to 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
					CO-4	Students are able to create polymers like Bakelite and nylon-6.
					CO-5	Students are able to evaluate the saponification value, surface tension and viscosity of lubricant oils
7	I/I	R-18	English Language and Communication Skills Lab	EN107HS	CO-1	student be able to intrupt nuances of English language through audio- visual experience and group activities
					CO-2	Use Speaking skills clearly with the right accent and intonation
					CO-3	Stdent will organize Speaking skills with clarity and confidence which in turn enhances their employ ability skills
					CO-4	Able to Implement Neutralization of accent for intelligibility
					CO-5	Understand and apply knowledge of human communication and language process.
8	I/I	R-18	Basic Electrical Engineering Lab	EE108ES	CO-1	Remember an exposure to basic electrical laws.
					CO-2	Understand the response of different types of electrical circuits to different excitations.
					CO-3	Evaluate the measurement, calculation and relation between the basic electrical parameters
					CO-4	Analyze the basic characteristics of transformers and its connections
					CO-5	Differenciate the performance of different machines using different methods
9	I/II	R-18	Mathematics - II	MA201BS	CO-1	Identify whether the given differential equation of first order is exact or not. Applications of first order differential equations
					CO-2	Solve higher differential equation and apply the concept of differential equation to real world problems.
					CO-3	Evaluate the multiple integrals and apply the concepts to find areas, volumes, center of mass and gravity for cubes, sphere and rectangular parallelepiped.
					CO-4	Apply the physical quantities involved in engineering field related to vector valued functions
					CO-5	Analyze the line, surface and volume integrals and converting them from one to another.
10	I/II	R-18	Applied Physics	AP202BS	CO-1	Apply the fundamental concepts on Quantum behavior of matter in its microstate.
					CO-2	Understand the of fundamentals of Semiconductor Physics, Optoelectronics which evaluate the students to apply to various systems like communication, solar cell, photocell etc.,
					CO-3	Analyze the principle, working of various Laser systems and light propagation through Optical Fibers.
					CO-4	Design, Analyze Characterize, and study the properties of materials and to prepare new materials for various engineering applications.
					CO-5	Evaluate the Laws of Electromagnetism and get an exposure on Magnetic and Dielectric materials.
					CO-1	Able to formulate the algorithm for simple problem and able to translate given algorithm to working and correct program

11	I/II	R-18	Programming for Problem Solving	CS203ES	CO-2	Demonstrate the use of arrays,structure and pointers
					CO-3	Able to create, read and write to and append to from simple text and binary files
					CO-4	understand about the function and dynamic memory allocation and deal location
					CO-5	Apply different searching and sorting technique on array elements
12	I/II	R-18	Engineering Graphics	ME204ES	CO-1	Apply computer aided drafting tools to create 2D and 3D objects
					CO-2	sketch conics and different types of solids
					CO-3	Apply the knowledge of Sectional views of solids and Development of surfaces of solids
					CO-4	Demonstrate Read and interpret engineering drawings
					CO-5	Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting
13	I/II	R-18	Applied Physics Lab	AP205BS	CO-1	Understand the characteristics of Photo emitters and Photo detectors
					CO-2	Construct RC & LCR circuit in Series and parallel.
					CO-3	Study the magnetic field variation along the axis of the circular coil carrying current.
					CO-4	Understand the working of Optical fiber and find the values of Numerical Aperture and Bending Losses.
					CO-5	Find the value of Energy gap and Hall coefficient of a given semiconductor material.
14	I/II	R-18	Programming for Problem Solving Lab	CS206ES	CO-1	Translate the given algorithm to a working and correct program
					CO-2	Identify and correct logical errors encountered during execution
					CO-3	Manipulate data with arrays strings and structures
					CO-4	creatre read and write to and from simple text and binary files
					CO-5	Modularize the code with functions so that they can be reused
15	I/II	R-18	Environmental Science	*MC209ES	CO-1	Gain knowledge about environment and ecosystem
					CO-2	Students will learn about natural resource, its importance and environmental impacts of human activities on natural resource.
					CO-3	Gain knowledge about the conservation of biodiversity and its importance.
					CO-4	Aware students about problems of environmental pollution, its impact on human and ecosystem and control measures.
16	II/I	R-18	Discrete Mathematics	CS310PC	CO-1	Ability to understand and construct precise mathematical proofs
					CO-2	Ability to use logic and set theory to formulate precise statements
					CO-3	Ability to analyze and solve counting problems on finite and discrete structures
					CO-4	Ability to describe and manipulate sequences
					CO-5	Ability to apply graph theory in solving computing problems
17	II/I	R-18	Data Structures	CS302PC	CO-1	Ability to select the data structures that efficiently model the information in a problem.
					CO-2	Ability to assess efficiency trade-offs among different data structure implementations or combinations.
					CO-3	Implement and know the application of algorithms for sorting and pattern matching
					CO-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.
					CO-5	Enhance their algorithmic thinking skills and learn how to design algorithms that leverage the strengths of specific data structures to solve problems efficiently.
18	II/I	R-18	Mathematical and Statistical Foundations	MA313BS	CO-1	Apply the number theory concepts to cryptography domain
					CO-2	Apply the concepts of probability and distributions to some case studies
					CO-3	Correlate the material of one unit to the material in other units
					CO-4	Resolve the potential misconceptions and hazards in each topic of study.

19	II/I	R-18	Computer Organization and Architecture	CS304PC	CO-1	Understand the basics of instructions sets and their impact on processor design
					CO-2	Demonstrate an understanding of the design of the functional units of a digital computer system.
					CO-3	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.
					CO-4	Design a pipeline for consistent execution of instructions with minimum hazards
					CO-5	Recognize and manipulate representations of numbers stored in digital computers
20	II/I	R-18	Python Programming	CS311PC	CO-1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions
					CO-2	Demonstrate proficiency in handling Strings and File Systems
					CO-3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions
					CO-4	Interpret the concepts of Object-Oriented Programming as used in Python
					CO-5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python
21	II/I	R-18	Business Economics & Financial Analysis	SM306MS	CO-1	understand the various Forms of Business and the impact of economic variables on the Business
					CO-2	The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt
					CO-3	The Students can study the firm's financial position by analysing the Financial Statements of a Company.
					CO-4	Learn how to apply economic principles to make rational decisions in various business scenarios, considering factors like opportunity cost, marginal analysis, and cost-benefit analysis.
					CO-5	Able to analyze markets and industry trends, assess competitive forces, and make strategic business decisions based on market conditions.
22	II/I	R-18	Data Structures Lab	CS307PC	CO-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.
					CO-2	Ability to Implement searching and sorting algorithms
					CO-3	Proficient in implementing algorithms associated with data structures, such as sorting and searching algorithms, graph traversal, and tree traversal algorithms.
					CO-4	Will analyse the time and space complexity of their data structure implementation
					CO-5	Understand how different data structures affect the performance of various operations.
23	II/I	R-18	Python Programming Lab	CS312PC	CO-1	Student should be able to understand the basic concepts scripting and the contributions of scripting language
					CO-2	Ability to explore python especially the object-oriented concepts, and the built in objects of Python
					CO-3	Ability to create practical and contemporary applications such as TCP/IP network programming, Web applications, discrete event simulations
24	II/I	R-18	Gender Sensitization Lab	*MC309	CO-1	Understand the importance of Environmental education, conservation of natural resources & understand the importance of ecosystems and biodiversity
					CO-2	Understand the pollution problems and Apply the environmental science knowledge on solid waste management, disaster management
					CO-3	Apply the environmental science knowledge to improve the resources

24	II/I	R-18	Gender Sensitization Lab	MC309	CO-4	Identify the interactions and intersections of identities (e.g., gender, race, ethnicity, class, sexuality, and so on) and assess the ways in which they contribute to instances of privilege and power dynamics across cultures, space, and time. And their problems
					CO-5	Identified problem can be taken for case study and find out solution.
25	II/II	R-18	Formal Language and Automata Theory	CS416PC	CO-1	Able to understand the concept of abstract machines and their power to recognize the languages.
					CO-2	Able to employ finite state machines for modelling and solving computing problems
					CO-3	Able to design context free grammars for formal languages.
					CO-4	Able to distinguish between decidability and undecidability.
					CO-5	Able to gain proficiency with mathematical tools and formal methods
26	II/II	R-18	Software Engineering	CS417PC	CO-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)
					CO-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.
					CO-3	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
					CO-4	Understanding of the software development lifecycle, including requirements analysis, design, implementation, testing, deployment, and maintenance.
					CO-5	Learn how to design and conduct software testing to ensure software quality and reliability.
27	II/II	R-18	Operating Systems	CS403PC	CO-1	Will be able to control access to a computer and the files that may be shared
					CO-2	Demonstrate the knowledge of the components of computer and their respective roles in computing
					CO-3	Ability to recognize and resolve user problems with standard operating environments.
					CO-4	Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
					CO-5	Learn about device drivers, I/O operations, interrupt handling, and how the operating system interacts with hardware devices
28	II/II	R-18	Database Management Systems	CS404PC	CO-1	Gain knowledge of fundamentals of DBMS, database design and normal forms
					CO-2	Master the basics of SQL for retrieval and management of data.
					CO-3	Be acquainted with the basics of transaction processing and concurrency control.
					CO-4	Familiarity with database storage structures and access techniques
					CO-5	Study distributed database systems and the challenges associated with data distribution and replication.
29	II/II	R-18	Object Oriented Programming using Java	CS412PC	CO-1	Able to solve real world problems using OOP techniques
					CO-2	Able to understand the use of abstract classes.
					CO-3	Able to solve problems using java collection framework and I/o classes.
					CO-4	Able to develop multithreaded applications with synchronization.
					CO-5	Able to develop applets for web applications
					CO-1	Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.
					CO-2	Able to implement C programs using Unix system calls

30	II/II	R-18	Operating Systems Lab	CS406PC	CO-3	Will work with threads and understand how to create, manage, and synchronize threads in a multi-threaded environment.
					CO-4	Will experiment with different CPU scheduling algorithms, such as round-robin, priority-based, and shortest job first, and analyze their performance.
					CO-5	Perform various file system operations, including file creation, reading, writing, and deletion, while understanding the impact of different file system structures.
31	II/II	R-18	Database Management Systems Lab	CS407PC	CO-1	Design database schema for a given application and apply normalization
					CO-2	Acquire skills in using SQL commands for data definition and data manipulation.
					CO-3	Develop solutions for database applications using procedures, cursors and triggers
					CO-4	Learn how to design and implement databases based on specific requirements, including creating tables, defining relationships, and ensuring data integrity.
					CO-5	Become proficient in using SQL (Structured Query Language) to perform various database operations
32	II/II	R-18	Java Programming Lab	CS408PC	CO-1	Able to write programs for solving real world problems using java collection frame work
					CO-2	Able to write programs using abstract classes
					CO-3	Able to write multithreaded programs
					CO-4	Able to write GUI programs using swing controls in Java
					CO-5	Understand multithreading concepts in Java and learn how to write concurrent programs to leverage modern hardware capabilities.
33	II/II	R-18	Constitution of India	*MC409	CO-1	To understand Indian Constitutional Law
					CO-2	To understand historical background of Constitutional Law
					CO-3	To learn Fundamental Rights and Duties
					CO-4	To understand differences between Parliamentary and Presidential form of Government
34	III/I	R-18	Design and Analysis of Algorithms	CS501PC	CO-1	Ability to analyze the performance of algorithms
					CO-2	Ability to choose appropriate data structures and algorithm design methods for a specified application
					CO-3	Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs
					CO-4	Will explore algorithms for graph traversal, shortest path, minimum spanning trees, and network flow problems.
					CO-5	Will gain experience with backtracking algorithms for solving problems with a search and prune strategy.
35	III/I	R-18	Introduction to Data Science	DS502PC	CO-1	Understand basic terms what Statistical Inference means.
					CO-2	Identify probability distributions commonly used as foundations for statistical modelling. Fit a model to data
					CO-3	describe the data using various statistical measures
					CO-4	utilize R elements for data handling
					CO-5	perform data reduction and apply visualization techniques.
36	III/I	R-18	Computer Networks	DS503PC	CO-1	Gain the knowledge of the basic computer network technology.
					CO-2	Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
					CO-3	Obtain the skills of subnetting and routing mechanisms.

36	III/I	R-18	Computer Networks	DS505PC	CO-4	Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation
					CO-5	Will become familiar with network protocols such as TCP/IP, HTTP, DNS, DHCP, and SMTP, and how they facilitate data transmission and communication.
37	III/I	R-18	Data Mining	DS721OE	CO-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.
					CO-2	Apply preprocessing methods for any given raw data.
					CO-3	Extract interesting patterns from large amounts of data.
					CO-4	Discover the role played by data mining in various fields
					CO-5	Choose and employ suitable data mining algorithms to build analytical applications
38	III/I	R-18	Web Programming	DS513PE	CO-1	Design web pages
					CO-2	Use technologies of Web Programming
					CO-3	Apply object-oriented aspects to Scripting.
					CO-4	Create databases with connectivity using JDBC
					CO-5	Build web-based application using sockets.
39	III/I	R-18	Software Project Management	DS523PE	CO-1	Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project.
					CO-2	Compare and differentiate organization structures and project structures.
					CO-3	Implement a project to manage project schedule, expenses and resources with the application of suitable project management tools.
					CO-4	Design and Develop software product using modern principles of software project managemnet
					CO-5	Gain the knowledge of software economics in the lifecycle of software development.
40	III/I	R-18	Data Mining Lab	DS509PE	CO-1	Ability to explain different kinds of data warehouse tools.
					CO-2	Utilize the existing tool and perform data pre-processing.
					CO-3	Ability to analyze the data and apply appropriate algorithm for decision making
					CO-4	Ability to add mining algorithms as a component to the existing tool
					CO-5	Ability to develop a system to help a loan officer to decide whether the credit of a customer is good or bad using mining algorithms
41	III/I	R-18	Computer Networks Lab	DS505PC	CO-1	Implement data link layer farming methods.
					CO-2	Analyze error detection and error correction codes
					CO-3	Implement and analyze routing and congestion issues in network design.
					CO-4	Implement Encoding and Decoding techniques used in presentation layer.
					CO-5	To be able to work with different network tools.
42	III/I	R-18	Advanced Communication Skills Lab	EN508HS	CO-1	Develop confidence and proficiency in delivering effective speeches and presentations in front of an audience.
					CO-2	Enhance their verbal communication skills, including clarity, articulation, tone, and language fluency.
					CO-3	Learn the importance of nonverbal cues, such as body language, gestures, and facial expressions, and how to use them effectively.
					CO-4	Practice effective communication in one-on-one or small group interactions, learning active listening and empathy.
					CO-5	Practice storytelling techniques to convey information effectively and engage their audience.
43	III/I	R-18	Intellectual Property Rights	*MC510	CO-1	Able to Define different types of Intellectual Property Rights.
					CO-2	Able to Classify different Intellectual Property Rights

43	III/I	R-18	Intellectual Property Rights	MC510	CO-3	Able to Identify importance of Trademark & Copy Right Laws.
					CO-4	Able to Explain importance of Patents, Trade Secret Laws
44	III/II	R-18	Compiler Design	CS702PC	CO-1	Demonstrate the ability to design a compiler given a set of language features
					CO-2	Demonstrate the the knowledge of patterns, tokens & regular expressions for lexical analysis
					CO-3	Acquire skills in using lex tool &yacc tool for developing a scanner and parser
					CO-4	Design and implement LL and LR parsers
					CO-5	Design algorithms to generate machine code
45	III/II	R-18	Machine Learning	DS602PC	CO-1	Understand the concepts of computational intelligence like machine learning
					CO-2	Ability to get the skill to apply machine learning techniques to address the real time problems in different areas
					CO-3	Understand the Neural Networks and its usage in machine learning application.
					CO-4	Will learn techniques to optimize machine learning models and prevent overfitting through regularization.
					CO-5	Will be introduced to deep learning, including neural networks, convolutional neural networks (CNNs), recurrent neural networks (RNNs), and their applications in computer vision, natural language processing, and speech recognition.
46	III/II	R-18	Big Data Analytics	DS603PC	CO-1	Ability to explain the foundations, definitions, and challenges of Big Data and various Analytical tools
					CO-2	Ability to program using HADOOP and Map reduce, NOSQL
					CO-3	Ability to understand the importance of Big Data in Social Media and Mining.
					CO-4	Able to understand data analytics with R machine learning
47	III/II	R-18	Software Testing Methodologies	DS631PE	CO-1	List a range of different software testing techniques and strategies and be able to apply specific(automated) unit testing method to the projects.
					CO-2	Distinguish characteristics of structural testing methods.
					CO-3	Demonstrate the integration testing which aims to uncover interaction and compatibility problems as early as possible.
					CO-4	Discuss about the functional and system testing methods
					CO-5	Demonstrate various issues for object oriented testing
48	III/II	R-18	Fundamentals of Internet of Things	EC600OE	CO-1	Known basic protocols in sensor networks
					CO-2	Program and configure Arduino boards for various designs
					CO-3	Python programming and interfacing for Raspberry Pi.
					CO-4	Design IoT applications in different domains
49	III/II	R-18	Disaster Preparedness & Planning Management	CE600OE	CO-1	The application of Disaster Concepts to Management.
					CO-2	Analyzing Relationship between Development and Disasters
					CO-3	Ability to understand Categories of Disasters.
					CO-4	Realization of the responsibilities to society.
50	III/II	R-18	Machine Learning Lab	DS604PC	CO-1	understand complexity of Machine Learning algorithms and their limitations
					CO-2	understand modern notions in data analysis-oriented computing
					CO-3	be capable of confidently applying common Machine Learning algorithms in practice and implementing their own
					CO-4	Be capable of performing experiments in Machine Learning using real-world data
					CO-5	Will work with popular machine learning libraries and frameworks, such as scikit-learn.

51	III/II	R-18	Big Data Analytics Lab	DS605PC	CO-1	Use Excel as an Analytical tool and visualization tool.
					CO-2	Ability to program using HADOOP and Map reduce.
					CO-3	Ability to perform data analytics using ML in R
					CO-4	Use cassandra to perform social media analytics
52	III/II	R-18	Software Testing Methodologies Lab	DS611PE	CO-1	Design and implement automated test scripts for various functionalities using industry-standard test automation tools.
					CO-2	Analyze software requirements and map them to effective test automation strategies.
					CO-3	Troublsshoot and debug automated test scripts for efficient test
					CO-4	Effectively communicate test automation findings using appropriate documentation and reporting methods.
					CO-5	Critically evaluate the suitability of different test automation toools based on project requirements.
53	III/II	R-18	Environmental Science	*MC609	CO-1	Gain knowledge about environment and ecosystem
					CO-2	Students will learn about natural resource, its importance and environmental impacts of human activities on natural resource.
					CO-3	Gain knowledge about the conservation of biodiversity and its importance.
					CO-4	Aware students about problems of environmental pollution, its impact on human and ecosystem and control measures.
54	IV/I	R-18	Predictive Analytics	DS701PC	CO-1	Understand prediction-related principles, theories and approaches.
					CO-2	Learn model assessment and validation.
					CO-3	Understand the basics of predictive techniques and statistical approaches
					CO-4	Analyze supervised and unsupervised algorithms.
55	IV/I	R-18	Web and Social Media Analytics	DS702PC	CO-1	Knowledge on decision support systems.
					CO-2	Apply natural language processing concepts on text analytics
					CO-3	Understand sentiment analysis.
					CO-4	Knowledge on search engine optimization and web analytics.
56	IV/I	R-18	Internet of Things	EC600OE	CO-1	Understand how IoT can contribute to energy efficiency by optimizing resource usage and reducing waste.
					CO-2	how IoT is applied in various industries, such as healthcare, agriculture, smart cities, manufacturing, transportation, and more.
					CO-3	Learn about IoT applications for environmental monitoring, including air quality, water quality, and climate tracking.
					CO-4	Explore the development of smart home devices and connected consumer products.
					CO-5	Learn how to interface with IoT devices, collect data from sensors, and control actuators remotely.
57	IV/I	R-18	Cloud Computing	DS752PE	CO-1	Ability to understand various service delivery models of a cloud computing architecture
					CO-2	Ability to understand the ways in which the cloud can be programmed and deployed.
					CO-3	Understanding cloud service providers.
					CO-4	Learn how to scale computing resources up or down based on demand, allowing applications to handle varying workloads efficiently.
					CO-5	Understand how to optimize costs by paying only for the resources and services used, without the need for large upfront investments in hardware.
58	IV/I	R-18	Principles of Entrepreneurship	MT701OE	CO-1	Understand the concept of Entrepreneurship
					CO-2	Financing and Managing the new ventures
					CO-3	Industrial Financial Support
					CO-4	Learning about production and marketing management

					CO-5	Understanding Labour Legislations
59	IV/I	R-18	Web and Social Media Analytics Lab	DS704PC	CO-1	Knowledge on decision support systems
					CO-2	Apply natural language processing concepts on text analytics
					CO-3	Understand sentiment analysis.
					CO-4	Knowledge on search engine optimization and web analytics
60	IV/I	R-18	Industrial Oriented Mini Project/ Summer Internship	DS606PC	CO-1	Apply his/her knowledge to understand the industrial applications
					CO-2	Observe the process of problem identification its formulation and solution.
					CO-3	Prepare a detailed report on the work carried
					CO-4	Present in front of the evaluation committee and other participants
61	IV/I	R-18	Seminar	DS802PC	CO-1	Conduct the literature survey in his / her chosen work of the specialized engineering domain
					CO-2	Have the recent developments in the chosen work
					CO-3	Prepare a detailed report on the work carried
					CO-4	Present in front of the evaluation committee and other participants
62	IV/I	R-18	Project Stage – I	DS705PC	CO-1	Demonstrate the technical knowledge of their selected project topic.
					CO-2	Undertake problem identification, formulation and solution.
					CO-3	Design engineering solutions to complex problems utilizing a systems approach.
					CO-4	Work with practicing engineers
					CO-5	Demonstrate the knowledge and skills acquired during the course work
63	IV/II	R-18	Organizational Behaviour	DS801PC	CO-1	Understanding Organizational Behavior
					CO-2	To Understand cognitive processes
					CO-3	To Understanding Organizational dynamics
					CO-4	To Understanding Organizational group dynamics
					CO-5	To Understand about the work practices and leadership
64	IV/II	R-18	Blockchain Technology	DS864PE	CO-1	Learn about research advances related to one of the most popular technological areas today
					CO-2	gain a solid grasp of what blockchain technology is, how it works, and its core components such as blocks, chains, cryptographic hashing, and consensus mechanisms.
					CO-3	explore the role of cryptocurrencies (e.g., Bitcoin, Ethereum) and digital assets in blockchain ecosystems, including how transactions are validated and recorded on the blockchain.
					CO-4	understand the security features of blockchain technology, including cryptographic techniques, immutability, and protection against tampering.
					CO-5	explore various consensus algorithms (e.g., Proof of Work, Proof of Stake) that govern how transactions are verified and added to the blockchain.
65	IV/II	R-18	Environmental Impact Assessment	CE800OE	CO-1	Identify the environmental attributes to be considered for the EIA study
					CO-2	Formulate objectives of the EIA studies
					CO-3	Identify the methodology to prepare rapid EIA
					CO-4	Prepare EIA reports and environmental management plans
66	IV/II	R-18	Project Stage - II	DS802PC	CO-1	Develop comprehensive solution of issues identified in project stage-1 and to meet the requirements as stated in project brief.
					CO-2	Synthesize the results of the detailed analytical studies conducted, lay down validity and design criteria, interpret the result for application to the problem, develop the concept and detailed design solution and to effectively communicate the thesis rationale.
					CO-3	Demonstrate the knowledge, skills and attitudes of a professional engineer.

					CO-4	Communicate with engineers and the community at large in written an oral forms.
					CO-5	Able to write effective technical report and demonstrate through presentation