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S.Y. B. Tech. Semester III Course Outcomes

DJS22CEC301 & DJS22CET301 - Engineering Mathematics

After completing the course, Student will be able to:	
DJS22CEC301.1	Use Laplace and inverse Laplace Transform to the Ordinary Differential Equations.
DJS22CEC301.2	Expand the periodic function by using Fourier series and complex form of Fourier series.
DJS22CEC301.3	Apply Fourier Transform in the future subjects like signal processing.
DJS22CEC301.4	Apply the concept of Z- transformation and its inverse of the given sequence

(DJS22CEC302 & DJS22CEL302 - Data Structures

After completing the course, Student will be able to:	
DJS22CEC302.1	Understand the concept of time complexity for algorithms.
DJS22CEC302.2	Assimilate the concept of various linear and non-linear data structures.
DJS22CEC302.3	Solve the problem using appropriate data structure
DJS22CEC302.4	Implement appropriate searching and sorting algorithms for a given problem.

DJS22CEC303- Discrete Structures

After completing the course, Student will be able to:	
DJS22CEC303.1	Understand discrete and fuzzy set theory.
DJS22CEC303.2	Verify the correctness of an argument using propositional and predicate logic and truth tables.
DJS22CEC303.3	Understand Relations, Diagraph and lattice and functions.
DJS22CEC303.4	Apply principles and concepts of graph theory and trees in practical situations.
DJS22CEC303.5	Understand the different Algebraic structures and demonstrate use of groups and codes in Encoding and Decoding.

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DJS22CEC304 & DJS22CEL304- Database Management Systems

After completing the course, Student will be able to:
DJS22CEC304.1	Design an optimized database.
DJS22CEC304.2	Construct SQL queries to perform operations on the database.
DJS22CEC304.3	Demonstrate appropriate transaction management and recovery techniques for a given problem.
DJS22CEC304.4	Apply indexing mechanisms for efficient retrieval of information from database..

DJS22CEC305 & DJS22CEL305- Digital Electronics

After completing the course, Student will be able to:
DJS22CEC305.1	Understand different number systems and their arithmetic.
DJS22CEC305.2	Analyze and minimize logical expressions.
DJS22CEC305.3	Design and analyze combinational circuits and sequential circuits
DJS22CEC305.4	Design and analyze synchronous and asynchronous counters.
DJS22CEC305.5	Understand programming logic devices.

DJS22CEL306 - Programming Laboratory-I (Python)

After completing the course, Student will be able to:
DJS22CEL306.1	Understand basic and object-oriented concepts, data structure implementation in python.
DJS22CEL306.2	Apply file, directory handling and text processing concepts in python.
DJS22CEL306.3	Apply database connectivity, client-server communication using python.
DJS22CEL306.4	Develop python-based application using Tkinter.

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DJS22ILLA1- Innovative Product Development-I

After completing the course, Student will be able to:	
DJS22ILLA1.1	Identify the requirement for a product based on societal/research needs
DJS22ILLA1.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJS22ILLA1.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJS22ILLA1.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product.
DJS22ILLA1.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJS22ILLA1.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJS22ILLA1.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication.

DJS22A2- Innovative Product Development-I

After completing the course, Student will be able to:	
DJS22A2.1	Have general knowledge and legal literacy and thereby take up competitive examinations.
DJS22A2.2	Understand state and central policies, fundamental duties.
DJS22A2.3	Understand Electoral Process, special provisions.
DJS22A2.4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies.
DJS22A2.5	Understand Engineering ethics and responsibilities of Engineers.
DJS22A2.6	Understand Engineering Integrity & Reliability.

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S.Y. B. Tech. Sem IV: Course Outcomes

DJS22CEC401 & DJS22CET401- Engineering Mathematics

After completing the course, Student will be able to:	
DJS22CEC401.1	Demonstrate ability to manipulate matrices and compute Eigen values and Eigen vectors. Use matrix algebra with its specific rules to solve the system of linear equation, using concept of Eigen value and Eigen vector to the engineering problems.
DJS22CEC401.2	Apply the concept of probability distribution to the engineering problems.
DJS22CEC401.3	Draw conclusions on population based on large and small samples taken and hence use it to understand data science.
DJS22CEC401.4	Apply the concept of Optimization, Correlation and Regression to the engineering problems.

DJS22CEC402 & DJS22CEL402- Operating Systems

After completing the course, Student will be able to:	
DJS22CEC402.1	Understand role of Operating System in terms of process, memory, file and I/O management.
DJS22CEC402.2	Apply appropriate process scheduling, memory mapping and disk scheduling methods.
DJS22CEC402.3	Identify the need of concurrency and apply appropriate method to solve the concurrency or deadlock problem
DJS22CEC402.4	Apply and analyze different techniques of file and I/O management.

DJS22CEC403 & DJS22CEL403 - Design and Analysis of Algorithms

After completing the course, Student will be able to:	
DJS22CEC403.1	Analyze the performance of algorithms using asymptotic analysis.
DJS22CEC403.2	Solve the problem using appropriate algorithmic design techniques.
DJS22CEC403.3	Able to prove that certain problems are NP-Complete.

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DJS22CEC404 & DJS22CEL404 - Processor Organization and Architecture

After completing the course, Student will be able to:	
DJS22CEC404.1	Understand the arithmetic and logic algorithms for processors.
DJS22CEC404.2	Understand the concepts of memory organization and mapping techniques.
DJS22CEC404.3	Explain, Interpret and implement the instructions and addressing modes of 8086 microprocessor and write assembly and mixed language programs.
DJS22CEC404.4	Understand various parameters to evaluate processor performance.
DJS22CEC404.5	Understand advanced trends and technologies in processor architectures.

DJS22CEL405: Programming Laboratory-II (Web Design)

After completing the course, Student will be able to:	
DJS22CEC405.1	Implement interactive web page(s) using HTML5, CSS3 and JavaScript.
DJS22CEC405.2	Design Web Applications using Typescript.
DJS22CEC405.3	Implement Single Page Applications using Angular, React.js and Node.js Framework.
DJS22CEC405.4	Create REST Web services using MongoDB.

DJS22IHC1: Universal Human Values

After completing the course, Student will be able to:	
DJS22IHC1.1	Become more aware of themselves, and their surroundings (family, society, and nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have better critical ability
DJS22IHC1.2	Become sensitive to their commitment towards what they have understood (human values, human relationships, and human society).
DJS22IHC1.3	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

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DJS22ILLA2: Innovative Product Development-II

After completing the course, Student will be able to:	
DJS22ILLA2**.**1	Identify the requirement for a product based on societal/research needs.
DJS22ILLA2.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team
DJS22ILLA2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJS22ILLA2.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product.
DJS22ILLA2.5	Develop interpersonal skills, while working as a member of the team or as the leader..
DJS22ILLA2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long Learning, which could eventually prepare themselves to be successful entrepreneurs.
DJS22ILLA2.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper presentation) as well as oral communication.

DJS22A3: Environmental Studies

After completing the course, Student will be able to:	
DJS22A3**:**.1	Understand how human activities affect environment
DJS22A3.2	Understand the various technology options that can make aa difference

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T. Y. B. Tech. Semester V Course Outcomes

DJ19CEC501 & DJ19CEL501 - Data Mining and Warehouse

After completing the course, Student will be able to:

DJ19CEC501.1	Understand Data Warehouse fundamentals and data mining principles..
DJ19CEC501.2	Design data warehouse with dimensional modelling.
DJ19CEC501.3	Understand ETL process and apply OLAP operations
DJ19CEC501.4	Apply appropriate pre-processing techniques.
DJ19CEC501.5	Identify appropriate data mining algorithms to solve real world problems
DJ19CEC501.6	Compare and evaluate different data mining techniques like classification, clustering and association rule mining

DJ19CEC502 & DJ19CEL502 - Processor Organization and Architecture

After completing the course, Student will be able to:

DJ19CEC502.1	Understand the arithmetic and logic algorithms for processors.
DJ19CEC502.2	Understand the concepts of memory organization and mapping techniques.
DJ19CEC502.3	Explain, Interpret and implement the instructions and addressing modes of 8086 microprocessor and write assembly and mixed language programs.
DJ19CEC502.4	Understand the architecture and concepts of an 8051 microcontroller.
DJ19CEC502.5	Understand advanced trends and technologies in processor architectures.

DJ19CEC503 & DJ19CEL503 - Artificial Intelligence

After completing the course, Student will be able to:

DJ19CEC503.1	Develop a basic understanding of AI building blocks presented in intelligent agents
DJ19CEC503.2	Design appropriate problem solving method for an agent to find a sequence of actions to reach goal state.
DJ19CEC503.3	Analyse various AI approaches to knowledge– intensive problem solving, reasoning and planning.
DJ19CEC503.4	Design models for reasoning with uncertainty as well as different types of learning.
DJ19CEC503.5	Design and develop the AI applications in real world scenario.

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DJ19CEEC5011 & DJ19CEEL5011- Advanced Operating System

After completing the course, Student will be able to:	
DJ19CEEC5011.1	Analyze the difference between different types of operating systems.
DJ19CEEC5011.2	Describe real time operating systems.
DJ19CEEC5011.3	Apply correct distributed and multiprocessor operating system concepts to solve real life problems.
DJ19CEEC5011.4	Design models for reasoning with uncertainty as well as different types of learning.
DJ19CEEC5011.5	Design and develop the AI applications in real world scenario.

DJ19CEEC5012& DJ19CEEC5012- Advanced Database Management System

After completing the course, Student will be able to:	
DJ19CEEC5012.1	Discuss new developments in database technology.
DJ19CEEC5012.2	Measure query cost and optimize query execution.
DJ19CEEC5012.3	Design distributed database for better resource management.
DJ19CEEC5012.4	Demonstrate the understanding of the concepts of document-oriented databases.
DJ19CEEC5012.5	Apply appropriate security techniques database systems.
DJ19CEEC5012.6	Implement advanced data models for real life applications

DJ19CEL504- Programming Laboratory –II (Python)

After completing the course, Student will be able to:	
DJ19CEL504.1	Understand basic and object-oriented concepts, data structure implementation in python.
DJ19CEL504.2	Apply file, directory handling and text processing concepts in python.
DJ19CEL504.3	Apply database connectivity, client-server communication using python..
DJ19CEL504.4	Apply various advance modules of Python for data analysis
DJ19CEL504.5	Develop python-based application (web/Desktop) using django web framework/Tkinter.

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DJ19IHL2 - Professional and Business Communication Laboratory

After completing the course, Student will be able to:	
DJ19IHL2.1	Plan, organize and write technical documents like reports, proposals and research papers in the prescribed format using appropriate language and style with an understanding of ethics in written communication
DJ19IHL2.2	Apply techniques of writing resume, participating in a group discussion and facing interviews
DJ19IHL2.3	Develop interpersonal skills in professional and personal situations
DJ19IHL2.4	Understand the documentation process of meetings and conduct meetings in a professional manner
DJ19IHL2.5	Understand communication across cultures and work ethics
DJ19IHL2.5	Design and deliver effective presentations using Power Point

DJ19ILL1 – Innovative product Development –III

After completing the course, Student will be able to:	
DJ19ILL1.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL1.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJ19ILL1.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL1.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product.
DJ19ILL1.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ19ILL1.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJ19ILL1.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication.

Shri Vile Parle Kelavani Mandal's
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Affiliated to the University of Mumbai)
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T.Y. B. Tech. Semester VI Course Outcomes

DJ19CEC601 & DJ19CEL601- Software Engineering

After completing the course, Student will be able to:	
DJ19CEC601.1	Understand and Demonstrate basic knowledge in Software Engineering
DJ19CEC601.2	Identify requirements, analyse, design and develop the software projects..
DJ19CEC601.3	Plan, schedule and track the progress of the projects
DJ19CEC601.4	Identify risks, manage the configuration and change in software.
DJ19CEC601.5	Apply testing principles on software projects.
DJ19CEC601.6	Apply latest tools and techniques on software projects.

DJ19CEC602 & DJ19CEL602- Advance Algorithm

After completing the course, Student will be able to:	
DJ19CEC602.1	Analyze the chosen algorithm.
DJ19CEC602.2	Choose appropriate data structure and algorithm for given problem statement.
DJ19CEC602.3	Design the algorithm.

DJ19CEC603 & DJ19CEL603 - Information Security

After completing the course, Student will be able to:	
DJ19CEC603.1	Understand system security goals and concepts, classical encryption techniques and acquire fundamental knowledge on the concepts of modular arithmetic and number theory.
DJ19CEC603.2	Understand, compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication
DJ19CEC603.3	Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes
DJ19CEC603.4	Apply different digital signature algorithms to achieve authentication and design secure applications
DJ19CEC603.5	Understand network security basics, analyze different attacks on networks and systems.
DJ19CEC603.6	Understand Software vulnerability and Apply preventive measures.

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DJ19CEEC6011 & DJ19CEEC6011 - Big Data Infrastructure

After completing the course, Student will be able to:	
DJ19CEEC6011.1	Describe big data and use cases from selected business domains.
DJ19CEEC6011.2	Perform map-reduce analytics using Hadoop
DJ19CEEC6011.3	Use Hadoop related tools such as HBase, Cassandra, Pig, and Hive for big data Analytics
DJ19CEEC6011.4	Build and maintain reliable, scalable, distributed systems using Apache Spark.
DJ19CEEC6011.5	Design and build MongoDB based Big data Applications and learn MongoDB query language.
DJ19CEEC6011.6	Use streaming tools for real time analysis of bigdata.

DJ19CEEC6012 & DJ19CEEL6012: Internet of Things

After completing the course, Student will be able to:	
DJ19CEEC6012.1	Comprehend the Internet of Things concepts and investigate the challenges.
DJ19CEEC6012.2	Identify machine learning techniques suitable for a given problem
DJ19CEEC6012.3	Develop and deploy IoT system prototype with enhanced IoT Technologies.
DJ19CEEC6012.4	Get hand-on exposure to different IoT processors and controllers
DJ19CEEC6012.5	Use IoT communication models and protocols.
DJ19CEEC6012.6	Design and develop small IoT applications to create smart objects

DJ19CEEC6013 & DJ19CEEC6013: Business Analytics

After completing the course, Student will be able to:	
DJ19CEEC6013.1	Able to familiar with Base SAS programming.
DJ19CEEC6013.2	Understand and demonstrate visual analytics.
DJ19CEEC6013.3	Able to design the report using reporter
DJ19CEEC6013.4	View various reports using different media devices.

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DJ19CEEC6021 & DJ19CEEL6021: Machine Learning

After completing the course, Student will be able to:	
DJ19CEEC6021.1	Gain knowledge about basic concepts of Machine Learning
DJ19CEEC6021.2	Identify machine learning techniques suitable for a given problem
DJ19CEEC6021.3	Apply Dimensionality reduction techniques.
DJ19CEEC6021.4	Solve the problems using various machine learning techniques
DJ19CEEC6021.5	Understand the basics of Reinforcement and deep learning.
DJ19CEEC6021.6	Design application using machine learning techniques

DJ19CEEC6022 & DJ19CEEL6022: Compiler Design

After completing the course, Student will be able to:	
DJ19CEEC6022**:**.1	Understand the basics of compilation steps.
DJ19CEEC6022.2	Apply knowledge of automata theory and formal languages.
DJ19CEEC6022.3	Understand and Implement a Parser.
DJ19CEEC6022.4	Describe techniques for intermediate code and machine code optimization.
DJ19CEEC6022.5	Apply various Error Recovery mechanisms

DJ19CEEC6023 & DJ19CEEL6023 - Human Machine Interaction

After completing the course, Student will be able to:	
DJ19CEEC6023.1	Identify User Interface (UI) design principles.
DJ19CEEC6023.2	Analysis of effective user friendly interfaces
DJ19CEEC6023. 3	Apply Interactive Design process in real world applications.
DJ19CEEC6023. 4	Evaluate UI design and justify
DJ19CEEC6023. 5	Create application for social and technical task.

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DJ19ILL2: Innovative Product Development-IV

After completing the course, Student will be able to:	
DJ19ILL2:1	Identify the requirement for a product based on societal/research needs
DJ19ILL2.2	Apply knowledge and skills required to solve a societal need by conceptualising a product, especially while working in a team
DJ19ILL2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL2.4	Draw proper inferences through theoretical/ experimental/simulations and analyse the impact of the proposed method of design and development of the product.
DJ19ILL2.5	Develop interpersonal skills, while working as a member of theteam or as theleader.
DJ19ILL2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.

DJ19A5- Environmental Studies

After completing the course, Student will be able to:	
DJ19A5.1.	Understand how human activities affect environment
DJ19A5.2	Understand the various technology options that can make a difference

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B. Tech. Semester VII Course Outcomes

DJ19CEC701 & DJ19CEL701 - Digital Signal Processing and Applications

After completing the course, Student will be able to:	
DJ19CEC701.1	Understand concept of digital signal processing and applications
DJ19CEC701.2	Classify and analyze discrete time signals and systems
DJ19CEC701.3	Apply the efficient computing algorithms of DFT and FFT in finding the response of the system
DJ19CEC701.4	Use the enhancement techniques for digital Image Processing
DJ19CEC701.5	Apply digital image processing techniques for edge detection

DJ19CEC702 & DJ19CEL702 - Distributed Computing

After completing the course, Student will be able to:	
DJ19CEC702.1	Demonstrate knowledge of the basic elements and concepts related to distributed system technologies
DJ19CEC702.2	Illustrate the middleware technologies that support distributed applications such as RPC, RMI and Object based middleware.
DJ19CEC702.3	Analyse the various techniques used for clock synchronization and mutual exclusion
DJ19CEC702.4	Demonstrate the concepts of Resource and Process management and synchronization algorithms
DJ19CEC702.5	Demonstrate the concepts of Consistency and Replication Management
DJ19CEC702.6	Apply the knowledge of Distributed File System to analyse various file systems like NFS, AFS and the experience in building large-scale distributed applications.

DJ19CEEC7011 & DJ19CEEL7011 - Deep Learning

After completing the course, Student will be able to:	
DJ19CEEC7011.1	Understand and Apply Hyper parameters Tuning
DJ19CEEC7011.2	Interpret working of deep learning models
DJ19CEEC7011.3	Create Deep learning Models for real-world problems
DJ19CEEC7011.4	Investigate suitable deep learning algorithms for various applications.

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DJ19CEEC7012 & DJ19CEEL7012 - Blockchain Technology

After completing the course, Student will be able to:	
DJ19CEEC7012.1	Acquire basic knowledge of Blockchain technology and Analyze various algorithms used in Blockchain.
DJ19CEEC7012.2	Introduce about cryptocurrency and various regulations.
DJ19CEEC7012.3	Aware of privacy and security issues and applications in Blockchain
DJ19CEEC7012.4	Design and understand various applications using Blockchain and Distributed Foundation and case studies.

DJ19CEEC7013 & DJ19CEEL7013- Predictive Modelling

After completing the course, Student will be able to:	
DJ19CEEC7013.1	Understand the process of formulating business objectives, data selection/collection, preparation and process to successfully design, build, evaluate and implement predictive models for a various business application
DJ19CEEC7013.2	Compare the underlying predictive modeling techniques. Compare the underlying predictive modeling techniques.
DJ19CEEC7013.3	Apply statistical analysis to wide range of problems such as decision tree
DJ19CEEC7013.4	Implement neural network and regression in predictive modeling

DJ19ILO7011 - Product Life Cycle Management

After completing the course, Student will be able to:	
DJ19ILO7011.1	Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation
DJ19ILO7011.2	Illustrate various approaches and techniques for designing and developing products.
DJ19ILO7011.3	Apply product engineering guidelines / thumb rules in designing products for moulding, machining, sheet metal working etc.
DJ19ILO7011.4	Acquire knowledge in applying virtual product development tools for components, machining and manufacturing plant

DJ19ILO7012 - Management Information System

After completing the course, Student will be able to:	
DJ19ILO7012.1	Explain how information systems Transform Business
DJ19ILO7012.2	Identify the impact information systems have on an organization
DJ19ILO7012.3	Describe IT infrastructure and its components and its current trends
DJ19ILO7012.4	Understand the principal tools and technologies for accessing information from databases to improve business performance and decision making
DJ19ILO7012.5	Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses

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DJ19ILO7013 - Operations Research

After completing the course, Student will be able to:	
DJ19ILO7013.1	Convert a real-world problem in to a Linear Programming Problem and analyse the solution obtained using Simplex method or other algorithms.
DJ19ILO7013.2	Identify real-world problems as Transportation Problem and Assignment Problem and Solve the decision problem by choosing appropriate algorithm.
DJ19ILO7013.3	Identify the decision situations which vary with time and analyse them using principle of dynamic programming to real life situations.
DJ19ILO7013.4	Explain reasons of formation of queues, classify various queuing systems and apply parameters defined for various queuing systems for decision making in real life situations
DJ19ILO7013.5	Understand the concept of decision making in situation of competition and recommend strategies in case of two-person zero sum games
DJ19ILO7013.6	Describe concept of simulation and apply Monte Carlo Simulation technique to systems such as inventory, queuing and recommend solutions for them.
DJ19ILO7013.7	Understand need for right replacement policy and determine optimal replacement age

DJ19ILO7014 - Cyber Security and Laws

After completing the course, Student will be able to:	
DJ19ILO7014.1	Understand the different types of cybercrime and security issues E Business.
DJ19ILO7014.2	Analyses different types of cyber threats and techniques for security management
DJ19ILO7014.3	Explore the legal requirements and standards for cyber security in various countries to regulate cyberspace.
DJ19ILO7014.4	Impart the knowledge of Information Technology Act and legal frame work of right to privacy, data security and data protection.

DJ19ILO7015 - Personal Finance Management

After completing the course, Student will be able to:	
DJ19ILO7015.1	Use a framework for financial planning to understand the overall role finances play in his/her personal life.
DJ19ILO7015.2	Compute income from salaries, house property, business/profession, capital gains and income from other sources.
DJ19ILO7015.3	Compute the amount of CGST, SGST and IGST payable after considering the eligible input tax credit.
DJ19ILO7015.4	Understand how Microfinance can help in financial inclusion.

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DJ19ILO7016 - Energy Audit and Management

After completing the course, Student will be able to:	
DJ19ILO7016.1	To identify and describe present state of energy security and its importance
DJ19ILO7016.2	To identify and describe the basic principles and methodologies adopted in energy audit of a utility.
DJ19ILO7016.3	To describe the energy performance evaluation of some common electrical installations and identify the energy saving opportunities.
DJ19ILO7016.4	To describe the energy performance evaluation of some common thermal installations and identify the energy saving opportunities.
DJ19ILO7016.5	To analyze the data collected during performance evaluation and recommend energy saving measures.

DJ19ILO7017 - Disaster Management and Mitigation Measures

After completing the course, Student will be able to:	
DJ19ILO7017.1	Know natural as well as manmade disaster and their extent and possible effects on the economy
DJ19ILO7017.2	Know the institutional framework and organization structure in India for disaster management and get acquainted with government policies, acts and various emergency laws.
DJ19ILO7017.3	Get to know the simple dos and don'ts in such extreme events and build skills to respond accordingly
DJ19ILO7017.4	Understand the importance of disaster prevention and various mitigation measure with the exposure to disasters hotspots across the globe.

DJ19ILO7018 - Science of Well-being

After completing the course, Student will be able to:	
DJ19ILO7018.1	Describe concepts of holistic health and well-being, differentiate between its true meaning and misconceptions and understand the benefits of well-being
DJ19ILO7018.2	Recognize meaning of happiness, practice gratitude and self-compassion and analyze incidents from one's own life.
DJ19ILO7018.3	Understand the causes and effects of stress, identify reasons for stress in one's own surrounding and self.
DJ19ILO7018.4	Recognize the importance of physical health and fitness, assess their life style and come up with limitations or effectiveness.
DJ19ILO7018.5	Inspect one's own coping mechanism, assess its effectiveness, develop and strategize for betterment and execute it.

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DJ19ILO7019 - Research Methodology

After completing the course, Student will be able to:	
DJ19ILO7019.1	Prepare a preliminary research design for projects in their subject matter areas
DJ19ILO7019.2	Accurately collect, analyze and report data
DJ19ILO7019.3	Present complex data or situations clearly
DJ19ILO7019.4	Review and analyze research findings
DJ19ILO7019.5	Write report about findings of research carried out

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B. Tech. Sem VIII Course Outcomes

DJ19CEC801 & DJ19CEL801- Web Intelligence

After completing the course, Student will be able to:	
DJ19CEC801.1	Interpret the terminologies and perspectives of Web Mining.
DJ19CEC801.2	Perform social network analysis to identify communities and network properties in social media sites.
DJ19CEC801.3	Extract and Integrate information from the web for real-world scenarios.
DJ19CEC801.4	Design new solutions to opinion extraction and sentiment classification problems
DJ19CEC801.5	Provide solutions to the emerging problems with social media using Recommendation systems

DJ19CEC802 & DJ19CEL802- High Performance Computing

After completing the course, Student will be able to:	
DJ19CEC802.1	Comprehend fundamental concepts parallel processing approaches
DJ19CEC802.2	Describe different parallel processing platforms involved in achieving High Performance Computing.
DJ19CEC802.3	Discuss different design issues in parallel programming
DJ19CEC802.4	Develop efficient and high-performance parallel programming.
DJ19CEC802.5	Learn parallel programming using message passing paradigm using open-source APIs and shared address space platforms.

DJ19CEEC8011 & DJ19CEEL8011- Natural Language Processing

After completing the course, Student will be able to:	
DJ19CEEC8011.1	Understand the principles and Process the Human Languages Such as English and other Indian Languages using computers
DJ19CEEC8011.2	Creating CORPUS linguistics based on digestive approach (Text Corpus method)
DJ19CEEC8011.3	Demonstrate understanding of state-of-the-art algorithms and techniques for text-based processing of natural language with respect to morphology.
DJ19CEEC8011.4	Perform POS tagging for a given natural language and select a suitable language modelling technique based on the structure of the language.
DJ19CEEC8011.5	Check the syntactic and semantic correctness of sentences using grammars and labelling.
DJ19CEEC8011.6	Develop Computational Methods for Real World Applications and explore deep learning based NLP

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DJ19CEEC8012 & DJ19CEEL8012- Software Architecture

After completing the course, Student will be able to:	
DJ19CEEC8012.1	Specify and evaluate software architectures.
DJ19CEEC8012.2	Select and use appropriate architectural styles.
DJ19CEEC8012.3	Select and use appropriate software design patterns.
DJ19CEEC8012.4	Understand and perform a design review with agile project architecture.

DJ19CEEC8013 & DJ19CEEL8013- Software Testing and Quality Assurance

After completing the course, Student will be able to:	
DJ19CEEC8013.1	Use various Software testing techniques to produce quality software.
DJ19CEEC8013.2	Identify Learn Life-cycle models for requirements.
DJ19CEEC8013.3	Design process models for units, integration, system, and acceptance testing
DJ19CEEC8013.4	Identify various Quality Models.

DJ19ILO8021 - Project Management

After completing the course, Student will be able to:	
DJ19ILO8021.1	Explain project management life cycle and the various project phases as well as the role of project manager.
DJ19ILO8021.2	Apply selection criteria and select an appropriate project from different options.
DJ19ILO8021.3	Create a work break down structure for a project and develop a schedule based on it. Manage project risk strategically.
DJ19ILO8021.4	Use Earned value technique and determine & predict status of the project.
DJ19ILO8021.5	Capture lessons learned during project phases and document them for future reference.

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DJ19ILO8022 - Entrepreneurship Development and Management

After completing the course, Student will be able to:	
DJ19ILO8022.1	Develop idea generation, creative and innovative skills
DJ19ILO8022.2	Prepare a Business Plan
DJ19ILO8022.3	Compare different entrepreneur supporting institutions
DJ19ILO8022.4	Correlate suitable MSME scheme for an entrepreneur
DJ19ILO8022.5	Interpret financial and legal aspect of a business.

DJ19ILO8023 - Corporate Social Responsibility

After completing the course, Student will be able to:	
DJ19ILO8023.1	Understand the key characteristics of Corporate Social Responsibility (CSR) in the context of present-day management.
DJ19ILO8023.2	Apprise regarding business decision-making which is informed by ethical values and respect for people communities and the environment.
DJ19ILO8023.3	Become aware of creating a strategic plan that enables an organization to reach out to its internal and external stakeholders with consistent messages.
DJ19ILO8023.4	Understand critical issues of Corporate Social Responsibility (CSR) in a cross-cultural setting
DJ19ILO8023.5	Interpret financial and legal aspect of a business.

DJ19ILO8024 - Human Resource Management

After completing the course, Student will be able to:	
DJ19ILO8024.1	Understand the concepts, aspects, techniques and practices of the human resource management
DJ19ILO8024.2	Understand the Human resource management (HRM) processes, functions, changes and challenges in today's emerging organizational perspective.
DJ19ILO8024.3	Gain knowledge about the latest developments and trends in HRM.
DJ19ILO8024.4	Apply the knowledge of behavioral skills learnt and integrate it with in inter personal and intergroup environment emerging as future stable engineers and managers.

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DJ19ILO8025 - Corporate Finance Management

After completing the course, Student will be able to:	
DJ19ILO8025.1	Understand Indian finance system.
DJ19ILO8025.2	Apply concepts of time value money and risk returns to product, services and business.
DJ19ILO8025.3	Understand corporate finance; evaluate and compare performance of multiple firms.
DJ19ILO8024.4	Take Investment, finance as well as dividend decisions.

DJ19ILO8026 - Logistic and Supply Chain Management

After completing the course, Student will be able to:	
DJ19ILO8026.1	Demonstrate the functional strategy map of supply chain management.
DJ19ILO8026.2	Analyze the determinants of Supply Chain and Transportation networks design
DJ19ILO8026.3	Demonstrate the need of coordination and sourcing decisions in supply chain.
DJ19ILO8026.4	Understand pricing, revenue management and role of IT in supply chain.
DJ19ILO8026.5	Understand various sustainability aspects of a supply chain

DJ19ILO8027 - IPR and Patenting

After completing the course, Student will be able to:	
DJ19ILO8027.1	Recognize the crucial role of IP for the purposes of product and technology development.
DJ19ILO8027.2	Understand how and when to file a patent
DJ19ILO8027.3	Apply the knowledge to understand the entire ecosystem
DJ19ILO8027.4	Derive value from IP and leverage its value in new product and service development

DJ19ILO8028 - Digital Marketing Management

After completing the course, Student will be able to:	
DJ19ILO8028.1	Understand the digital marketing framework & model and consumer behaviour.
DJ19ILO8028.2	Develop digital marketing strategy roadmap.
DJ19ILO8028.3	Explain the terminology and concepts for developing web-specific media plans.
DJ19ILO8027.4	Understand concepts related to digital campaign management and revenue generation models.
DJ19ILO8028.5	Get a perspective on global digital marketing technology/tools and future trends.

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DJ19ILO8029 - Environmental Management

After completing the course, Student will be able to:	
DJ19ILO8029.1	Identify Environmental issues and get familiarized to the concept of Ecosystem and environmental management.
DJ19ILO8029.2	Know policies and legal aspects and understand EM system standards.
DJ19ILO8029.3	Understand Environment Impact assessment.
DJ19ILO8029.4	Understand Environment Auditing procedures.
DJ19ILO8029.5	Describe Environmental management Techniques

DJ19ILO8030 - Labour and Corporate Law

After completing the course, Student will be able to:	
DJ19ILO8030.1	Illustrate the role of trade union in the industrial setup
DJ19ILO8030.2	Understand the important causes, impact of industrial disputes and settlement procedures.
DJ19ILO8030.3	To provide in-depth understanding of corporate social responsibility.
DJ19ILO8030.4	Apply concepts, principles and theories to understand simple business laws.
DJ19ILO8030.5	Analyse the principle of international business and strategies adopted by firms to expand globally

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M. Tech. Semester I Course Outcomes

DJ19CEPGC101 & DJ19CEPGL101- Advanced Algorithm and Complexity

After completing the course, Student will be able to:	
DJ19CEPGC101.1	Analyze the correctness and running time of the algorithms that are implemented in several domains
DJ19CEPGC101.2	Apply the algorithms and design techniques to formulate the optimized solution
DJ19CEPGC101.3	Understand and apply various advanced data structures to solve computing problems
DJ19CEPGC101.4	Introduce and practice advanced algorithms and programming techniques necessary for developing sophisticated computer application programs

DJ19CEPGC102 - Advanced Soft Computing

After completing the course, Student will be able to:	
DJ19CEPGC102.1	Understand the constituents and characteristics of soft computing.
DJ19CEPGC102.2	Design fuzzy logic controller for various systems.
DJ19CEPGC102.3	Understand and apply fuzzy rough sets.
DJ19CEPGC102.4	Design neural networks for applications using supervised, unsupervised and reinforcement learning.
DJ19CEPGC102.5	Understand and apply hybrid systems to real world problems

DJ19CEPGC103 & DJ19CEPGL103 - Advanced Computer Network and Design

After completing the course, Student will be able to:	
DJ19CEPGC103.1	Understand IPV6 Protocol and advantages over IPV4
DJ19CEPGC103.2	Understand IP multicasting protocols and various TCP techniques
DJ19CEPGC103.3	Analyze various congestion control and avoidance techniques.
DJ19CEPGC103.4	Understand Ethernet networking and design new networking model

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DJ19CEPGC104- Internet of Things

After completing the course, Student will be able to:	
DJ19CEPGC104.1	Comprehend the Internet of Things concepts and investigate the challenges
DJ19CEPGC104.2	Gain knowledge of sensors and Design WSN.
DJ19CEPGC104.3	Develop IoT system prototype with enhanced IoT Technologies
DJ19CEPGC104.4	Use IoT communication models and protocols.
DJ19CEPGC104.5	Implement best practices for IoT Security.
DJ19CEPGC104.6	Design and develop small IoT applications to create smart objects.

DJ19CEPGE101- Ethical Hacking and Digital Forensics

After completing the course, Student will be able to:	
DJ19CEPGE101.1	Understand the basic concept of ethical hacking and various techniques.
DJ19CEPGE101.2	Apply hacking principles for Windows Operating System.
DJ19CEPGE101.3	Acquire knowledge of network and internet forensics.
DJ19CEPGE101.4	Understand and explore mobile for forensics procedures.
DJ19CEPGE101.5	Understand android mobile forensics
DJ19CEPGE101.6	Investigate and analyze android applications and forensics

DJ19CEPGE102- Big Data Infrastructure

After completing the course, Student will be able to:	
DJ19CEPGE102.1	Develop problem solving and critical thinking skills in fundamental enabling techniques like Hadoop and Mapreduce in big data analytics.
DJ19CEPGE102.2	Develop Data management capabilities for large scale data processing by using various bigdata technologies and APIs.
DJ19CEPGE102.3	To work and evaluate Data at scale-Working with Big Data.
DJ19CEPGE102.4	Analysis of statistical data using various analytical tools
DJ19CEPGE102.5	Design and develop cloud based applications with virtualization.

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DJ19CEPGE103- Natural Language Processing

After completing the course, Student will be able to:	
DJ19CEPGE103.1	Design an innovative application using NLP components.
DJ19CEPGE103.2	Implement a rule based system to tackle morphology/syntax of a language.
DJ19CEPGE103.3	Design a tag set to be used for statistical processing for real-time applications.
DJ19CEPGE103.4	Compare and contrast the use of different statistical approaches for different types of NLP applications

DJ19OCEC1021- Cyber Security and Laws

After completing the course, Student will be able to:	
DJ19OCEC1021.1	Understand the concept of cybercrime and its effect on outside world.
DJ19OCEC1021.2	Interpret and apply IT law in various legal issues.
DJ19OCEC1021.3	Distinguish different aspects of cyber law.
DJ19OCEC1021.4	Apply Information Security Standards compliance during software design and development.

DJ19OCEC1022- System Dynamics

After completing the course, Student will be able to:	
DJ19OCEC1022.1	Understand the concept of cybercrime and its effect on outside world.
DJ19OCEC1022.2	Demonstrate understanding of system concepts, system thinking and system archetypes
DJ19OCEC1022.3	Demonstrate understanding of sources of system complexity and counterintuitive behavior.
DJ19OCEC1022.4	Verify and validate selected models.
DJ19OCEC1022.5	Apply system dynamics concepts to real world problems.

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DJ19OCEC1023- Operation Research

After completing the course, Student will be able to:	
DJ19OCEC1023.1	Convert a real-world problem in to a Linear Programming Problem and Interpret the solution obtained using Simplex method or other algorithms.
DJ19OCEC1023.2	Understand reasons of formation of queues, Classify various queuing systems and Apply performance parameters defined for various queuing systems for decision making in real life situations.
DJ19OCEC1023.3	Describe concept of simulation and Apply Monte Carlo Simulation technique to systems such as inventory, queuing and Develop solutions for them.
DJ19OCEC1023.4	Explain the need for replacement of components or machines in most economical way and Infer optimal replacement age.
DJ19OCEC1023.5	Identify the decision situations which vary with time and Analyse them using principle of dynamic programming to real life situations.

DJ19OCEC1024- Wavelets

After completing the course, Student will be able to:	
DJ19OCEC1024.1	Implement multiphase and polyphase representation.
DJ19OCEC1024.2	Classify various wavelet transform and explain importance of it
DJ19OCEC1024.3	Describe Continuous Wavelet Transform (CWT) and Discrete Wavelet Transform (DWT)
DJ19OCEC1023.4	Explain the properties and application of wavelet transform.
DJ19OCEC1024.5	Develop and realize computationally efficient wavelet based algorithms for signal and image processing.

DJ19OCEC1025- Digital Marketing

After completing the course, Student will be able to:	
DJ19OCEC1025.1	Apply B2B and B2C contexts to plan content marketing
DJ19OCEC1025.2	Develop and measure impact of content that works well for your target audience.
DJ19OCEC1025.3	Manage social media presence, and create effective content for each platform.
DJ19OCEC1025.4	Optimize search engine presence through on-site and off-site activities, develop target keyword list, optimize website UX and design, and execute a link building campaign.
DJ19OCEC1025.5	Create, execute, and optimize an effective Ad campaign. Display and set up advertising works.
DJ19OCEC1025.6	Create an email marketing strategy, create and execute email campaigns, and measure the results.

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M. Tech. Semester II Course Outcomes

DJ19CEPGC201- High Performance Computing

After completing the course, Student will be able to:	
DJ19CEPGC201.1	Comprehend the various parallel processing approaches that forms base for high performance computing.
DJ19CEPGC201.2	Design and develop parallel algorithms and programs
DJ19CEPGC201.3	Explore various standard and advanced high-performance computing technologies.
DJ19CEPGC201.4	Analyze the performance measures in high performance computing.

DJ19CEPGC202 &: DJ19CEPGL202 - Secure Coding

After completing the course, Student will be able to:	
DJ19CEPGC202.1	Demonstrate knowledge of the basic elements and concepts related to distributed system technologies
DJ19CEPGC202.2	Illustrate the middleware technologies that support distributed applications such as RPC, RMI and Object based middleware.
DJ19CEPGC202.3	Analyse the various techniques used for clock synchronization and mutual exclusion
DJ19CEPGC202.4	Demonstrate the concepts of Resource and Process management and synchronization algorithms
DJ19CEPGC202.5	Demonstrate the concepts of Consistency and Replication Management

DJ19CEPGC203 & DJ19CEPGL203 - Predictive Analytics

After completing the course, Student will be able to:	
DJ19CEPGC203.1	Prepare raw data for predictive modeling.
DJ19CEPGC203.2	Apply different models to perform predictive modeling
DJ19CEPGC203.3	Compare different models and asses the best model for prediction.

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DJ19CEPGC204 - Data Storage Technology

After completing the course, Student will be able to:	
DJ19CEPGC204.1	Acquire the basic knowledge of storage and Data center
DJ19CEPGC204.2	Analyze various network and infrastructure used for data storage.
DJ19CEPGC204.3	Understand business continuity and various methods of data Back-ups.
DJ19CEPGC204.4	Introduce about storage management and virtualization and storage security.
DJ19CEPGC204.5	Differentiate cloud and network storage visualization.

DJ19CEPGE201 - Business Intelligence

After completing the course, Student will be able to:	
DJ19CEPGE201.1	Understand the characteristics of real world complex business problems
DJ19CEPGE201.2	Know the structure of Adaptive Business Intelligence System
DJ19CEPGE201.3	Analyze different prediction methods and models.
DJ19CEPGE201.4	Analyze different modern optimization techniques.
DJ19CEPGE201.5	Analyze different hybrid systems and adaptability
DJ19CEPGE201.6	Apply adaptive business intelligence in real time environment

DJ19CEPGE201 - Blockchain Technologies

After completing the course, Student will be able to:	
DJ19CEPGE201.1	Acquire the basic knowledge of Blockchain technology.
DJ19CEPGE201.2	Analyze various algorithms used in Blockchain.
DJ19CEPGE201.3	Introduce about cryptocurrency and various regulations.
DJ19CEPGE201.4	Aware about privacy and security issues in Blockchain.
DJ19CEPGE201.5	Design and understand various applications using Blockchain.

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DJ19OPGC2021 - Project Management

After completing the course, Student will be able to:	
DJ19OPGC2021.1	Assess a project by establishing a business case and accordingly prepare a project proposal.
DJ19OPGC2021.2	Develop a project plan
DJ19OPGC2021.3	Identify task inter-dependencies, construct and analyze a network diagram
DJ19OPGC2021.4	Monitorand control the performance of the project.
DJ19OPGC2021.5	Demonstrate Team work and team spirit and resolve conflicts

DJ19OPGC2022- IPR and Patenting

After completing the course, Student will be able to:	
DJ19OPGC2022.1	Understand Intellectual Property assets
DJ19OPGC2022.2	Assist individuals and organizations in capacity building
DJ19OPGC2022.3	Work for development, promotion, protection, compliance, and enforcement of Intellectual Property and Patenting

DJ19OPGC2023- Remote Sensing Concepts

After completing the course, Student will be able to:	
DJ19OPGC2023.1	Comprehend the basics of Remote Sensing
DJ19OPGC2023.2	Describe various Remote Sensing methods and sensors
DJ19OPGC2023.3	Explain various tools used for data extraction in Remote Sensing
DJ19OPGC2023.4	Apply the concepts of Remote Sensing for various applications

DJ19OPGC2024- Product Life Cycle Management

After completing the course, Student will be able to:	
DJ19OPGC2024.1	Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation.
DJ19OPGC2024.2	Illustrate various approaches and techniques for designing and developing products.
DJ19OPGC2024.3	Apply product engineering guidelines / thumb rules in designing products for moulding, machining, sheet metal working etc.
DJ19OPGC2024.4	Acquire knowledge in applying virtual product development tools for components, machining and manufacturing plant.

DJ19OPGC2025- Research Methodology

After completing the course, Student will be able to:	
DJ19OPGC2025.1	Prepare a preliminary research design for projects in their subject matter areas.
DJ19OPGC2025.2	Accurately collect, analyze and report data.
DJ19OPGC2025.3	Present complex data or situations clearly.
DJ19OPGC2025.4	Review and analyze research findings.

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S.Y. B. Tech. Semester III: Course Outcomes

DJS22EC301 & DJS22ET301 Engineering Mathematics III (Theory and Tutorial)	
After completing the course, Student will be able to:	
DJS22EC301.1	Apply the knowledge of Laplace transform and its properties to evaluate specific kind of integrals.
DJS22EC301.2	Apply knowledge of Inverse Laplace transform to solve ordinary, simultaneous differential equations.
DJS22EC301.3	Follow Fourier series expansion of functions which satisfy Dirichlet conditions and Fourier transform.
DJS22EC301.4	Demonstrate an ability to use vector algebra and vector calculus.
DJS22EC301.5	Apply the knowledge of analytic functions to obtain functions, conformal mapping, bilinear transformations.

DJS22EC302 & DJS22EL302 Electronics Circuit Design (Theory and Laboratory)	
After completing the course, Student will be able to:	
DJS22EC302.1	Describe the working principle of semiconductor devices and power devices.
DJS22EC302.2	Design and Analysis of Amplifier using BJT/MOSFET and evaluate frequency response.
DJS22EC302.3	Describe the working principle of Power amplifier, Feedback amplifier and Oscillator.
DJS22EC302.4	Implement different types of single and multistage amplifiers/Oscillator/ with different configuration/components with proper justifications for the results.

DJS22EC303 & DJS22EL303 Digital System Design (Theory and Laboratory)	
After completing the course, Student will be able to:	
DJS22EC303.1	Compute arithmetic operations on signed binary numbers.
DJS22EC303.2	Minimize logic expressions using various reduction techniques.
DJS22EC303.3	Design combinational logic circuits using logic gates.
DJS22EC303.4	Design flip-flops and use them to realize sequential circuits.
DJS22EC303.5	Classify different programmable logic devices and design combinational circuits using PLDs.

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DJS22EC304 & **DJS22ET304 Signals and Systems (Theory and Laboratory)**	
After completing the course, Student will be able to:	
DJ2S2EC304.1	Perform mathematical operations on signals to construct complex signals using basic elementary signals.
DJS22EC304.2	Classify signals and systems on the basis of their properties and analyse their implications in the context of practical signals and systems
DJS22EC304.3	Represent signals in the time and frequency domain using multiple representations and analyse LTI systems using convolution in the frequency domain.
DJS22EC304.4	Compute Fourier series/different transforms for a set of well-defined signals from first principles and apply their appropriate properties for a broader class of signals.

DJS22EL305 Electrical Networks Analysis & Synthesis Laboratory	
After completing the course, Student will be able to:	
DJS22EL305.1	Analyze complex networks involving dependent and independent sources using network theorems
DJS22EL305.2	Apply network topology for analyzing the circuit
DJS22EL305.3	Evaluate time and frequency domain responses for understanding the behavior of electrical circuits and stability using pole zero diagram
DJS22EL305.4	Compute various two port network parameters and to design T and Pi network.
DJS22EL305.5	Synthesize various Network functions in different forms. (RC, RL, LC, RLC)

DJS22EL306 Python Programming Laboratory	
After completing the course, Student will be able to:	
DJS22EL306.1	Describe various data types in Python
DJS22EL306.2	Implement control statements, conditional statements and functions in Pytho
DJS22EL306.3	Carry out file handling operations using Python
DJS22EL306.4	Perform various operations using Numpy, Matplotlib and Pandas in Python
DJS22EL306.5	Perform various operations on database using python

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DJS22IHC1 & DJS22IHT1 Universal Human Values and Tutorial	
After completing the course, Student will be able to:	
DJS22IHC1.1	Become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have better critical ability.
DJS22IHC1.2	Become sensitive to their commitment towards what they have understood (human values, human relationship, and human society).
DJS22IHC1.3	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

DJS22ILLA1 Innovative product development - I	
After completing the course, Student will be able to:	
DJS22ILLA1.1	Conduct a survey of several available literatures.
DJS22ILLA1.2	Demonstrate various approaches to complete a project.
DJS22ILLA1.3	Carry out collaborative project environment by interacting and dividing project work among team members.
DJS22ILLA1.4	Develop and enhance software/ hardware skills associated with the product design.

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S. Y. B. Tech. SEM IV Course Outcomes

DJ19ECC401& DJ19ECT401 Engineering Mathematics IV and Tutorial	
After completing the course, Student will be able to:	
DJS22EC401.1	Apply theory of probability in identifying and solving relevant problems.
DJS22EC401.2	Differentiate random variables through the use of cumulative distribution function (CDF), probability density function (PDF), probability mass function (PMF) as well as joint, marginal and conditional CDF, PDF and PMF.
DJS22EC401.3	Understand major types of probability sampling method and indicate when each is preferred.
DJS22EC401.4	Understand the theory of linear algebra.
DJS22EC401.5	Apply theory of eigensystems to principal component analysis.

DJS22EC402 & DJS22EL402 Integrated Circuits (Theory and Laboratory)	
After completing the course, Student will be able to:	
DJS22EC402.1	Describe the physical operation of integrated circuits using Op-Amp's
DJS22EC402.2	Analyse linear and non-linear Op-Amp applications.
DJS22EC402.3	Design various applications using Op-Amps, Timers, and special IC's.
DJS22EC402.4	Implement different types of applications using various Analog IC's with proper justifications for the results.

DJS22EC403 & DJS22ET403 Electromagnetics and Wave Propagation (Theory and Laboratory)	
After completing the course, Student will be able to:	
DJS22EC403.1	Compute electric and magnetic fields for symmetrical charge and current configurations using basic principles of electromagnetics.
DJS22EC403.2	Explain coupling between electric and magnetic fields through Faraday's law, displacement current and Maxwell's equations.
DJS22EC403.3	Explain Wave Polarization and propagation in different media.
DJS22EC403.4	Determine the parameters of transmission lines for various frequencies.

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DJS22EC404 & DJS22EL404 Microcontroller & Applications – I (Theory and Laboratory)	
After completing the course, Student will be able to:	
DJS22EC404.1	Identify different functionalities and architecture of 8051 microcontroller.
DJS22EC404.2	Identify different hardware components and use relevant software for programming of microcontroller based development system.
DJS22EC404.3	Write assembly language programs for microcontroller-based system using instruction set.
DJS22EC404.4	Interface different input/output devices with microcontroller for industry applications.

DJS22EL405 Data Analytics Laboratory	
After completing the course, Student will be able to:	
DJS22EL405.1	Perform data cleaning and transformations on a given dataset.
DJS22EL405.2	Perform data modeling using regression and classification methods.
DJS22EL405.3	Apply dimensionality reduction on high dimensional datasets.
DJS22EL405.4	Apply the concepts of Neural Network on non-linear datasets.
DJS22EL405.5	Apply ensemble techniques for imbalance datasets.
DJS22EL405.6	Apply clustering techniques for unsupervised datasets.

DJS22EL406 Database Management System Laboratory	
After completing the course, Student will be able to:	
DJS22EL406.1	Analyze a case study and create ER diagram of the scenario and able to create Database schema from this using SQL.
DJS22EL406.2	Write basic SQL queries to apply constraints, insert rows, do basic operations like alter, update and delete, to use basic aggregate functions and retrieve information from databases.
DJS22EL406.3	Write SQL queries to make joins and views on table.
DJS22EL406.4	Perform nested queries and triggers.

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DJS22A2 Constitution of India	
After completing the course, Student will be able to:	
DJS22A2.1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
DJS22A2.2	Understand state and central policies, fundamental duties.
DJS22A2.3	Understand Electoral Process, special provisions.
DJS22A2.4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies.
DJS22A2.5	Understand Engineering ethics and responsibilities of Engineers
DJS22A2.6	Understand Engineering Integrity & Reliability

DJS22ILLA2 Innovative Product Development-II	
After completing the course, Student will be able to:	
DJS22ILLA2.1	Accomplish project-based learning that allows students to identify and transfer existing ideas into new contexts and applications thereby improving individual grooming.
DJS22ILLA2.2	Present their research in the form of a technical report and thereby improve the technical skills.
DJS22ILLA2.3	Demonstrate the ability to work in teams and manage the conduct of the research study
DJS22ILLA2.4	Integrate different perspectives from relevant disciplines which help them to get internships, jobs and admission for higher studies.

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T. Y. B. Tech. SEM V Course Outcomes

DJ19ECC501 & DJ19ECL501: Microprocessor & Microcontroller (Theory and Laboratory)	
After completing the course, Student will be able to:	
DJ19ECC501.1	Identify hardware components, their functionalities and use relevant software for programming of Microprocessor & Microcontroller based development system.
DJ19ECC501.2	Identify microcontroller functionalities and architecture of 8051.
DJ19ECC501.3	Write programs for 8051 microcontroller based systems with the help of appropriate instruction set & structural programming concept.
DJ19ECC501.4	Interface input/output devices with 8051 microcontroller for various applications.
DJ19ECC501.5	Identify functionalities and architecture of ARM 7.

DJ19ECC502 & DJ19ECL502: Digital Signal Processing (Theory and Laboratory)	
After completing the course, Student will be able to:	
DJ19ECC502.1	Solve the efficient computing algorithms of DFT and FFT in finding the response of the system.
DJ19ECC502.2	Design Butterworth, Chebyshev types of IIR filters
DJ19ECC502.3	Design Lowpass, Highpass, Banapass, Bandstop types of FIR filters
DJ19ECC502.4	Examine the effects of Poles and Zeros in design of digital filters
DJ19ECC502.5	Classify the architecture of DSP Processors

DJ19ECC503 & DJ19ECL503: Radio Frequency Circuit Design (Theory and Laboratory)	
After completing the course, Student will be able to:	
DJ19ECC503.1	Analyse the single and Multiport network using ABCD/ S - parameters
DJ19ECC503.2	Analyse the behaviour of inductor, capacitor and resistor at high frequency
DJ19ECC503.3	Compute the parameters of transmission line (reflection coefficient, VSWR, input impedance) using analytical and graphical (smith chart) methods
DJ19ECC503.4	Design matching network using impedance transformers, tapered lines using analytical and graphical (smith chart) methods
DJ19ECC503.5	Design filters for given specifications using insertion loss and image parameter method

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DJ19ECEC5014 & DJ19ECEL5014 :Neural Network & Fuzzy Logic (Theory and Laboratory)	
On completion of the course, learner will be able to:	
DJ19ECEC5014.1	Explain training of Neural Networks using various training rules with consideration of different parameters like overfitting, underfitting,
DJ19ECEC5014.2	Calculate and update the weights of the neural networks to Specify the working and applications of different types of neural networks.
DJ19ECEC5014.3	Design fuzzy sets for various applications and solve fuzzy set theory problems.
DJ19ECEC5014.4	Design various engineering application using Neural Networks/ Fuzzy Logic.

DJ19ECEC5015 & DJ19ECEL5015: Operating Systems (Theory and Laboratory)	
At the end of this course, students will be able to	
DJ19ECEC5015. 1	Understand basic operating system commands, system calls and shell scripts of OS.
DJ19ECEC5015. 2	Explain the management policies adopted by processes, memory, File handling and I/O operations.
DJ19ECEC5015.3	Apply the algorithms used for memory management, CPU scheduling and disk scheduling.
DJ19ECEC5015.4	Apply concepts related to deadlock to solve problems.
DJ19ECEC5015. 5	Analyze the functionalities of OS like Unix, Linux and Real Time Operating Systems

DJ19ECSBC1 & J19ECSBL1 Data Structures and Algorithms (Theory and Laboratory	
At the end of this course, students will be able to:	
DJ19ECSBC1.1	To implement linear data structures using array and linked list.
DJ19ECSBC1.2	To solve problems using non-linear data structures.
DJ19ECSBC1.3	To analyze the performance of sorting and searching algorithms.

DJ19ECSBL2 Database Management System Laboratory	
After completing the course, Student will be able to:	
DJ19ECSBL2.1	Design and draw ER and EER diagram for the real-life problem.
DJ19ECSBL2.2	Create and update database and tables with different DDL and DML statements to integrity constraints.
DJ19ECSBL2.3	Implement and execute queries for performing Aggregate functions, Joints and Views and execute sub queries and Correlated sub queries.
DJ19ECSBL2.4	Analyse and apply concepts of normalization to relational database design and to understand the concept of transaction.

DJ19IHL2:Professional & Business Communication -Laboratory	
After completing the course, Student will be able to:	
DJ19IHL2.1	Plan, organize and write technical documents like reports, proposals and research papers in the prescribed format using appropriate language and style with an understanding of ethics in written communication
DJ19IHL2.2	Apply techniques of writing resume, participating in a group discussion and facing interviews
DJ19IHL2.3	Demonstrate interpersonal skills in professional and personal situations
DJ19IHL2.4	Articulate the documentation process of meetings and conduct meetings in a professional manner
DJ19IHL2.5	Explain communication across cultures and work ethics
DJ19IHL2.6	Design and deliver effective presentations using Power Point

DJ19ILL1 Innovative Product Development III	
Course outcome	CO statement
After completing the course, Student will be able to:	
DJ19ILL1.1	Define problem statement, formulation and solution by reviewing relevant literature
DJ19ILL1.2	Identify alternate approaches to complete a project
DJ19ILL1.3	Apply project management skills by interacting and dividing project work among team members
DJ19ILL1.4	Develop technical, communication, and presentation skills

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T. Y. B. Tech. SEM VI Course Outcomes

DJ19ECC601 & DJ19ECL601: Digital Communication (Theory and Laboratory)	
At the End of this course, learner will be able to:	
DJ19ECC601.1	Understand random variables and random processes of signal.
DJ19ECC601.2	Encode the messages for the given information source and compare various source coding algorithms for the given information source and quantify the average information content of it.
DJ19ECC601.3	Apply different error control coding techniques, design encoders for the given specifications.
DJ19ECC601.4	Compare and analyze various modulation techniques on the basis of signal space representation, power spectral density, spectral efficiency and probability of error
DJ19ECC601.5	Apply appropriate baseband processing and filtering techniques at transmitting and receiving end.

DJ19ECC602 & DJ19ECL602: Radiating Systems (Theory and Laboratory)	
At the end of this course, students will be able to:	
DJ19ECC602.1	Explain and measure basic antenna parameters like radiation pattern, input impedance, gain and polarization.
DJ19ECC602.2	Derive the field equations for the basic radiating elements like linear wire antenna and loop antenna.
DJ19ECC602.3	Design of uniform linear and planar antenna arrays using isotropic and directional Sources.
DJ19ECC602.4	Design regular shape microstrip antennas and aperture antennas.

DJ19ECC603 and DJ19ECL603: Fundamentals of Digital Image Processing (Theory and Laboratory)	
On completion of the course, learner will be able to:	
DJ19ECC603.1	Interpret the fundamental concepts of a digital image processing system.
DJ19ECC603.2	Analyze images in the frequency domain using DFT, DCT, Hadamard transform.
DJ19ECC603.3	Evaluate, compare and contrast the techniques for image enhancement, image restoration and morphology.
DJ19ECC603.4	Interpret and apply image segmentation and representation techniques for object recognition.

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DJ19ECC604 and DJ19ECL604: Computer Networks (Theory and Laboratory)

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

DJ19ECC604.1	Compare OSI layered architecture with TCP/IP protocol suite and differentiate functions of each layer.
DJ19ECC604.2	Define characteristics of physical media and differentiate among multiplexing techniques.
DJ19ECC604.3	Understand responsibilities of the data link layer and explain the datalink layer protocols.
DJ19ECC604.4	Design network and subnetwork and list the commands required to carry out investigations and troubleshooting.
DJ19ECC604.5	Distinguish transport layer protocols based on application.

DJ19ECEC6012 and DJ19ECEL6012: Data Compression & Encryption (Theory and

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

DJ19ECEC6012.1	Describe various lossy and lossless compression techniques.
DJ19ECEC6012.2	Apply various compression techniques for compression of text, image, audio and video.
DJ19ECEC6012.3	Describe public and private cryptosystems and network security related protocols.
DJ19ECEC6012.4	Analyze how the basic design criteria for cryptosystems like confusion, diffusion and number theory are used in cryptographic techniques.

DJ19ECEC6014 and DJ19ECEL6014: Artificial Intelligence & Machine Learning (Theory and Laboratory)

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

DJ19ECEC6014.1	Choose an appropriate problem solving method for an agent to find a sequence of actions to reach the goal state.
DJ19ECEC6014.2	Analyse the strength and weakness of AI approaches to knowledge representation, reasoning.
DJ19ECEC6014.3	Apply supervised learning algorithms for real world applications.
DJ19ECEC6014.4	Apply unsupervised learning algorithms for real world applications.

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DJ19ECESBL3: Microcontroller & Applications Laboratory	
At the end of the course, students will be able to	
DJ19ECESBL3.1	Understand the detailed architecture of LPC2148 microcontroller, Arduino & R-Pi Board.
DJ19ECESBL3.2	Interface peripheral devices to the LPC2148 microcontroller, Arduino & R-Pi Board.
DJ19ECESBL3.3	Write Assembly language & Embedded C programming for microcontrollers.
DJ19ECESBL3.4	Implement hardware circuit using Arduino board for given applications.

DJ19ILL2 Innovative Product Development-IV	
After completing the course, Student will be able to:	
DJ19ILL2.1	Apply engineering knowledge to produce solution of a problem considering cultural, social, environmental, and economic factors using appropriate tools and methods
DJ19ILL2.2	Demonstrate the idea of project based learning by Integrating and synthesizing different perspectives of a project from relevant disciplines.
DJ19ILL2.3	Develop an ability to work in teams and manage the conduct of the research study.

DJ19A5: Environmental Engineering	
At the end of the course, students will be able to	
DJ19A5.1	Understand how human activities affect environment
DJ19A5.2	Understand the various technology options that can make a difference

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B. Tech. SEM VII Course Outcomes

Mobile Communication System (Theory and Laboratory)	
After completing the course, Student will be able to:	
DJ19ECC 701.1	Classify different types of propagation models. Also analyze various propagation models using Simulink.
DJ19ECC701.2	Explain the cellular fundamentals and estimate the coverage and capacity of cellular systems. Also manipulate, simulate a user interface and debugging through MATLAB/Scilab/Python for the cellular concept system design fundamentals
DJ19ECC701.3	Illustrate the fundamentals and system architecture of GSM, 2.5G, IS-95 and UMTS.
DJ19ECC701.4	Elaborate on the concepts and principles of 4G network deployment and optimization.
DJ19ECC701.5	Identify the emerging technologies for upcoming mobile communication systems

DJ19ECC702 and DJ19ECL702: Microwave Engineering (Theory and Laboratory)	
At the end of the course, students will be able to	
DJ19ECC702.1	Analyze the signal propagation through guiding media and Microwave Components.
DJ19ECC702.2	Perform mathematical analysis of microwave tubes (Amplifiers and Oscillators) based on its operation/working principle.
DJ19ECC702.3	Analyze the Microwave Semiconductor devices
DJ19ECC702.4	Understand the Microwave communication systems.
DJ19ECC702.5	Demonstrate Microwave bench set-up for measurements and carry out simulations.

DJ19ECSBL5: Industrial Automation- Laboratory	
At the end of this course, students will be able to:	
DJ19ECSBL5.1	Identify basic components of an Industrial automation system.
DJ19ECSBL5.2	Interface the given input/output devices with appropriate PLC module.
DJ19ECSBL5.3	Prepare PLC ladder program for the given application
DJ19ECSBL5.4	Prepare SCADA programming for various Industrial applications.
DJ19ECSBL5.5	Explain distributed control system used in industry for automation.

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DJ19ECEC7011 & DJ19ECEL7011: Radar Engineering (Theory and Laboratory)

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

DJ19ECEL7011.1	Understand generalized concept of Radar & its applications.
DJ19ECEL7011.2	Analyze Radar range equation in real time atmoshpheric condition.
DJ19ECEL7011.3	Identify pulse radar, continuous wave radar and tracking radar for specific application.
DJ19ECEL7011.4	Evaluate the design constraints for transmitter and receiver like atmospheric condition and unwanted objects clutters.
DJ19ECEL7011.5	Understand the basics of mixer, limiter, displays and servomechnisum used in transmitter/receiver of RADAR.

DJ19ECEC7012 & DJ19ECEL7012: Big Data Analytics (Theory and Laboratory)

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

DJ19ECEC7012. 1	Understand the key issues in big data management and its associated applications for business decisions and strategy
DJ19ECEC7012. 2	Understand and Develop problem solving and critical thinking skills in fundamental enabling techniques like Hadoop and NoSQL in big data analytics
DJ19ECEC7012. 3	Evaluate Big Data processing by using MapReduce
DJ19ECEC7012. 4	Interpret business models and scientific computing paradigms and apply software tools for big data analytics
DJ19ECEC7012. 5	Exploring the capabilities of big data using Apache Spark

DJ19ECSBL4 IoT and Sensor Network Laboratory

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

ECSBL4.1	Identify different components of an IoT and Sensor network system.
ECSBL4.2	Designing and affordability of IoT devices.
ECSBL4.3	To explore the Industrial IoT, Industry 4.0, Connected Car applications.
ECSBL4.4	Use Internet of Things for real time applications

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DJ19ECP701: Project Stage –I	
At the end of this course, students will be able to:	
ECP701.1	Apply the technical knowledge gained from previous courses, Identify problems and design solutions to solve real-life problems
ECP701.2	Apply project management skills (scheduling work, procuring parts, documenting technical and non-technical details and working within the confined deadline).
ECP701.3	Create technical reports, research paper and present the same to the evaluation authorities

DJ19ILO7011: Product lifecycle Management	
At the end of this course, students will be able to :	
DJ19ILO7011.1	Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation.
DJ19ILO7011.2	Illustrate various approaches and techniques for designing and developing products.
DJ19ILO7011.3	Apply product engineering guidelines / thumb rules in designing products for moulding, machining, sheet metal working etc.
DJ19ILO7011.4	Acquire knowledge in applying virtual product development tools for components, machining and manufacturing plant

DJ19ILO7012: Management Information System	
At the end of this course, students will be able to :	
DJ19ILO7012.1	Explain how information systems Transform Business.
DJ19ILO7012.2	Identify the impact information systems have on an organization.
DJ19ILO7012.3	Analyze IT infrastructure, its components and current trends.
DJ19ILO7012.4	Understand the principal tools and techniques for accessing information from databases to improve business performance and decision making
DJ19ILO7012.4	Illustrate the types of systems used for enterprise-wide knowledge management and how they provide value for businesses

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DJ19ILO7013: Operational Research	
At the end of the course the student will be able to	
DJ19ILO7013.1	Understand the theoretical workings of the simplex method, the relationship between a linear program and its dual, including strong duality and complementary slackness.
DJ19ILO7013.2	Perform sensitivity analysis to determine the direction and magnitude of change of a model's optimal solution as the data change.
DJ19ILO7013.3	Solve specialized linear programming problems like the transportation and assignment problems, solve network models like the shortest path, minimum spanning tree, and maximum flow problems.
DJ19ILO7013.4	Understand the applications of integer programming and a queuing model and compute important performance measures.

DJ19ILO7014: Cyber Security and Laws	
At the end of this course, students will be able to :	
DJ19ILO7014.1	.Understand the concept of cybercrime and its effect on outside world.
DJ19ILO7014.2	Interpret and apply IT law in various legal issues.
DJ19ILO7014.3	Distinguish different aspects of cyber law.
DJ19ILO7014.4	Apply Information Security Standards compliance during software design and development.

DJ19ILO7015: Personal Finance Management	
At the end of this course, students will be able to :	
DJ19ILO7015.1	Use a framework for financial planning to understand the overall role finances play in his/her personal life
DJ19ILO7015.2	Compute income from salaries, house property, business/profession, capital gains and income from other sources
DJ19ILO7015.3	Compute the amount of CGST, SGST and IGST payable after considering the eligible input tax credit.
DJ19ILO7015.4	Understand how Microfinance can help in financial inclusion.

DJ19ILO7019: Research Methodology	
At the end of this course, students will be able to :	
DJ19ILO7019.1	Prepare a preliminary research design for projects in their subject matter areas
DJ19ILO7019.2	Accurately collect, analyze and report data
DJ19ILO7019.3	Present complex data or situations clearly
DJ19ILO7019.4	Review and analyze research findings
DJ19ILO7019.5	Write report about findings of research carried out

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B. Tech. SEM VIII Course Outcomes

DJ19ECC801 & DJ19ECL801 Wireless Network Theory and Laboratory	
After completion of the course learner will be able to:	
DJ19ECC801.1	Explain the fundamentals, architecture, design issues and standards and spectrum of various wireless network and compare them.
DJ19ECC801.2	Compute different parameters of wireless networks.
DJ19ECC801.3	Evaluate various wireless systems and deduce some conclusion
DJ19ECC801.4	Simulate various wireless systems using different simulation softwares.
DJ19ECC801.5	Gain ability to work in teams to solve complex problems and communicate effectively with technical reports/ writeups.

DJ19ECC802 & DJ19ECL802 Optical Communication (Theory and Laboratory)	
At the end of this course, students will be able to :	
DJ19ECC802.1	Describe the propagation of light in optical fibers for the ray theory and electromagnetic mode theory.
DJ19ECC802.2	Analyze transmission characteristics (attenuation /dispersion/Nonlinearity) of an optical fiber using differenttechniques.
DJ19ECC802.3	Compare and contrast working principle of optical sources, detectors and components
DJ19ECC802.4	Design optimal optical links by using Link budget and rise time budget and understand basic concepts ofoptical networks.

DJ19ECEC8012 & DJ19ECEL8012: Internet Engineering & Network Security Theory and Laboratory	
On completion of the course, learner will be able to:	
DJ19ECEC8012.1	Use various application layer protocols.
DJ19ECEC8012.2	Understand services of network layer provided by advanced protocols and design networks as per requirements.
DJ19ECEC8012.3	Summarise voice over IP in the context of real-time interactive audio/video service
DJ19ECEC8012.4	Summarise various techniques to implement security mechanisms for network security and security implications on organizations.

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DJ19ECEC8016 & DJ19ECEL8016 Machine Learning for Signal Processing Theory and Laboratory

At the end of this course, students will be able to :	
DJ19ECEC8016.1	Apply fundamentals of machine learning (ML) techniques useful for various signal processing applications.
DJ19ECEC8016.2	Understand various mathematical methods involved in ML for Signal Processing.
DJ19ECEC8016.3	Design models for Speech Recognition and Audio Classification.
DJ19ECEC8016.4	Design efficient models for Image Processing.

DJ19ECP801 Project Stage – II

At the end of this course, students will be able to :	
DJ19ECP801.1	Apply the technical knowledge gained from previous courses, Identify problems and design solutions to solve real-life problems
DJ19ECP801.2	Demonstrate technical skills required in an electronics industry for designing, building, testing electronic circuitry using modern software and hardware tools.
DJ19ECP801.3	Apply project management skills (scheduling work, procuring parts, documenting technical and non-technical details and working within the confined deadline).
DJ19ECP801.4	Develop and demonstrate troubleshooting ability in electronic circuits and systems (including software and hardware part of the systems).
DJ19ECP801.5	Create technical reports, research paper and present the same to the evaluation authorities.

DJ19ILO8021: Project Management

At the end of this course, students will be able to :	
DJ19ILO8021.1	Apply selection criteria and select an appropriate project from different options.
DJ19ILO8021.2	Write work break down structure for a project and develop a schedule based on it.
DJ19ILO8021.3	Identify opportunities and threats to the project and decide an approach to deal with them strategically.
DJ19ILO8021.4	Use Earned value technique and determine & predict status of the project.
DJ19ILO8021.5	Capture lessons learned during project phases and document them for future reference

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DJ19ILO8022: Entrepreneurship Development and Management	
At the end of this course, students will be able to :	
DJ19ILO8022.1	Understand the concept of business plan and ownerships
DJ19ILO8022.2	Interpret key regulations and legal aspects of entrepreneurship in India
DJ19ILO8022.3	Understand government policies for entrepreneurs

DJ19ILO8025 Corporate Finance Management (CSM)	
At the end of this course, students will be able to :	
DJ19ILO8025.1	Understand Indian finance system
DJ19ILO8025.2	Apply concepts of time value money and risk returns to product, services and business.
DJ19ILO8025.3	Understand corporate finance; evaluate and compare performance of multiple firms
DJ19ILO8025.4	Take Investment, finance as well as dividend decisions.

DJ19ILO8026 Logistics and Supply Chain Management (LSCM)	
At the end of this course, students will be able to :	
DJ19ILO8026.1	Demonstrate the functional strategy map of supply chain management.
DJ19ILO8026.2	Analyse the determinants of Supply Chain and Transportation networks design.
DJ19ILO8026.3	Demonstrate the need of coordination and sourcing decisions in supply chain.
DJ19ILO8026.4	Understand pricing, revenue management and role of IT in supply chain.
DJ19ILO8026.5	Understand various sustainability aspects of a supply chain.

DJ19ILO8029: Environmental Management	
At the end of this course, students will be able to :	
DJ19ILO8029.1	Understand the concept of environmental management
DJ19ILO8029.2	Understand ecosystem and interdependence, food chain etc.
DJ19ILO8029.3	Understand and interpret environment related legislation

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M.E EXTC Sem-I Course Outcomes

DJS22EPGC101 Statistical Signal Processing	
At the end of course, a student will be able to:	
DJS22EPGC101.1	Understand basics of linear algebra in communication engineering
DJS22EPGC101.2	Study and apply the concepts of random processes in telecommunication engineering
DJS22EPGC101.3	Develop and evaluate different signal detection and estimation techniques in diverse telecommunication systems.
DJS22EPGC101.4	Compare optimal filtering, linear estimation, and Wiener/Kalman filtering
DJS22EPGC101.5	Construct Wiener and Kalman filters (time discrete) and state space models

DJS22EPGC102 Microstrip Antenna Design	
At the end of course, a student will be able to:	
DJS22EPGC102.1	Design and investigate Microstrip Antennas
DJS22EPGC102.2	Associate the elementary design of Microstrip Antennas to advanced communication applications
DJS22EPGC102.3	To understand the concept of next generation antennas

DJS22EPGL103 Skill Based Laboratory - I	
At the end of course, a student will be able to:	
DJS22EPGL103.1	To provide an in-depth view of the Professional Elective Courses and provide a base for which they can select their Second Year Project

DJS22EPGC111 Advanced VLSI Design	
At the end of course, a student will be able to:	
DJS22EPGC111.1	Design CMOS circuits using different logic styles.
DJS22EPGC111.2	Analyse and design Low power VLSI circuits
DJS22EPGC111.3	Design circuits using Hardware descriptive language.
DJS22EPGC111.4	Design logic circuits using programmable logic devices.

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DJS22EPGC112 Error Correcting Codes	
At the end of course, a student will be able to:	
DJS22EPGC112.1	Design channel codes for the physical layer and storage applications.
DJS22EPGC112.2	Design and analyse channel codes for wired/wireless communication systems

DJS22EPGC113 Next Generation Networks	
At the end of course, a student will be able to:	
DJS22EPGC113.1	Describe technical features and design considerations of the next-generation networks.
DJS22EPGC113.2	Apply the concept of convergence of network services.
DJS22EPGC113.3	Understand the transition of IP networks to NGN.
DJS22EPGC113.4	Demonstrate technologies for next-generation network

DJS22EPGC121 Advanced Image & Video Processing	
At the end of course, a student will be able to:	
DJS22EPGC121.1	Illustrate fundamental concepts related to multidimensional signal processing, feature extraction, pattern analysis.
DJS22EPGC121.2	Recognize geometrical mapping between 2D and 3D world.

DJS22EPGC122 Embedded Systems for Robotics	
At the end of course, a student will be able to:	
DJS22EPGC122.1	Describe the design procedures involved in product development process
DJS22EPGC122.2	Design, implement and test RTOS based embedded system.
DJS22EPGC122.3	Recognize the application of robotic system for industrial automation
DJS22EPGC122.4	Develop programming principles and languages for a robot control system.

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DJS22EPGC123 Optical Networks	
At the end of course, a student will be able to:	
DJS22EPGC123.1	Interpret functions of various optical network components
DJS22EPGC123.2	Compare different multiplexing techniques and optical network architectures.
DJS22EPGC123.3	Understand components and designing aspects of WDM networks
DJS22EPGC123.4	Explain photonic packet switching concepts and access networks
DJS22EPGC123.5	Analyze different network management functions

DJS22EPGL101 Statistical Signal Processing Laboratory	
At the end of course, a student will be able to:	
DJS22EPGL101.1	To gain an in-depth knowledge in the estimation of random signals.
DJS22EPGL101.2	Extrapolate the importance of least squares techniques and decomposition methods in analyzing the signal estimations.

DJS22EPGL102 Microstrip Antenna Design Laboratory	
At the end of course, a student will be able to:	
DJS22EPGL102.1	To gain an in-depth knowledge in the design of Microstrip antennas
DJS22EPGL102.2	Apply various practises predominant for design of Microstrip antenna

DJS22OPGC131 Data Analytics	
At the end of course, a student will be able to:	
DJS22OPGC131.1	Interpret data using descriptive statistics
DJS22OPGC131.2	Demonstrate sampling distributions and estimate statistical parameters
DJS22OPGC131.3	Develop hypothesis based on data and perform testing using various statistical techniques
DJS22OPGC131.4	Perform analysis of variance on data.
DJS22OPGC131.5	Examine relations between data

DJS22OPGC132 Journey from Intellectual Property to Patenting	
At the end of course, a student will be able to:	
DJS22OPGC132.1	Recognize the crucial role of IP for the purposes of product and technology development
DJS22OPGC132.2	Understand how and when to file a patent
DJS22OPGC132.3	Apply the knowledge to understand the entire ecosystem
DJS22OPGC132.4	Derive value from IP and leverage its value in new product and service development

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DJS22OPGC133 Cyber Security and Laws	
At the end of course, a student will be able to:	
DJS22OPGC133.1	Understand the distinct types of cybercrime and security issues E Business.
DJS22OPGC133.2	Analyses distinct types of cyber threats and techniques for security management
DJS22OPGC133.3	Explore the legal requirements and standards for cyber security in various countries to regulate cyberspace.
DJS22OPGC133.4	Impart the knowledge of Information Technology Act and legal framework of right to privacy, data security and data protection

DJS22OPGC134 Agile Frameworks	
At the end of course, a student will be able to:	
DJS22OPGC134.1	Summarize the concepts of agile practices and business objectives
DJS22OPGC134.2	Gain knowledge on the phases of agile development framework.
DJS22OPGC134.3	Have an exposure on the scaling factors and models to be developed for agile projects.
DJS22OPGC134.4	Acquire knowledge on the agile performance measurement.
DJS22OPGC134.5	Develop the product based on agile factors with risk mitigation
DJS22OPGC134.6	Describe the role of agile in enterprise management and incremental delivery

DJS22OPGC135 Design of Experiments	
At the end of course, a student will be able to:	
DJS22OPGC135.1	Plan data collection, to turn data into information and to make decisions that lead to appropriate action
DJS22OPGC135.2	Apply the methods taught to real life situations
DJS22OPGC135.3	Plan, analyze, and interpret the results of experiments

DJS22OPGC136 Operations Research	
At the end of course, a student will be able to:	
DJS22OPGC136.1	Convert a real-world problem in to a Linear Programming Problem and Interpret the solution obtained using Simplex method or other algorithms.
DJS22OPGC136.2	Understand reasons of formation of queues, Classify various queuing systems and Apply performance parameters defined for various queuing systems for decision making in real life situations.
DJS22OPGC136.3	Describe concept of simulation and Apply Monte Carlo Simulation technique to systems such as inventory, queuing and Develop solutions for them.
DJS22OPGC136.4	Solve the Game and explore the optimal strategies.
DJS22OPGC136.5	Identify the decision situations which vary with time and Analyze them using principle of dynamic programming to real life situations.

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ME EXTC Sem-II Course Outcomes

DJS22EPGC201 RF and Microwave Engineering	
At the end of course, a student will be able to:	
DJS22EPGC201.1	Characterize devices at higher frequencies.
DJS22EPGC201.2	Design and analyze RF circuits and components
DJS22EPGC201.3	Design and analyze amplifiers, oscillators and mixers at microwave frequencies
DJS22EPGC201.4	Design and analyze power dividers, couplers at microwave frequencies.
DJS22EPGC201.5	Analyze EMI and EMC in RF circuit.

DJS22EPGC202 Advanced Wireless Communication Networks	
At the end of course, a student will be able to:	
DJS22EPGC202.1	To evaluate multichannel characteristics.
DJS22EPGC202.2	To outline the emerging technologies for upcoming Wireless Communication.
DJS22EPGC202.3	To assess network architecture of 5G.
DJS22EPGC202.4	To identify the need for Software Defined Networks.

DJS22EPGL203 Skill Based Laboratory -II	
At the end of course, a student will be able to:	
DJS22EPGL203.1	To provide an in depth view of the Professional Elective Courses and provide a base for which they can select their Second Year Project

DJS22EPGC211 Wavelets	
At the end of course, a student will be able to:	
DJS22EPGC211.1	Implement adaptive filters for a given application; study and apply the techniques of power spectrum estimation and wavelet theory for various applications.
DJS22EPGC211.2	Apply Signal Processing tools to biomedical signal processing and musical sound processing

DJS22EPGC212 IoT & Sensor Networks	
At the end of course, a student will be able to:	
DJS22EPGC212.1	Identify the IoT networking components with respect to OSI layer.
DJS22EPGC212.2	Design and develop IoT based sensor systems.
DJS22EPGC212.3	Select IoT protocols and software
DJS22EPGC212.4	Evaluate the wireless technologies for IoT.
DJS22EPGC212.5	Design architecture of IoT for various applications.
DJS22EPGC212.6	Appreciate the need for IoT Trust and variants of IoT

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DJS22EPGC213 Network and Cyber Security	
At the end of course, a student will be able to:	
DJS22EPGC213.1	Describe security threats and apply security techniques using cryptosystems
DJS22EPGC213.2	Describe different network security mechanisms
DJS22EPGC213.3	Define cybercrime, cybercriminals, and Intellectual property and discuss security implications on organizations.
DJS22EPGC213.4	Incorporate approaches for incident analysis and response, for risk management and digital evidence collection and evidentiary reporting in forensic acquisition.

DJS22EPGC221 Advanced Signal Analysis and Processing	
At the end of course, a student will be able to:	
DJS22EPGC221.1	Implement adaptive filters for a given application; study and apply the techniques of power spectrum estimation and wavelet theory for various applications.
DJS22EPGC221.2	Apply Signal Processing tools to biomedical signal processing and musical sound processing

DJS22EPGC222 Millimeter Wave Communication	
At the end of course, a student will be able to:	
DJS22EPGC222.1	Explain design constraint in communication systems at microwave and millimeter wave frequencies
DJS22EPGC222.2	Explain design consideration in Millimeter wave communication components and antennas.
DJS22EPGC222.3	Understand diversity over MIMO channels

DJS22EPGC223 Remote Sensing Concepts	
At the end of course, a student will be able to:	
DJS22EPGC223.1	Explain physical principles and sensing process in remote sensing
DJS22EPGC223.2	Describe preprocessing requirements and discuss various Digital Image Processing techniques.
DJS22EPGC223.3	Identify the earth surface features from satellite images
DJS22EPGC223.4	Apply the concepts of remote sensing for ecological applications

DJS22EPGL201 RF and Microwave Engineering Laboratory	
At the end of course, a student will be able to:	
DJS22EPGL201.1	Characterize devices at higher frequencies.
DJS22EPGL201.2	Do parametric study of transmission line and apply it for the design of passive components
DJS22EPGL201.3	Design and analyse amplifiers, oscillators at microwave frequencies.
DJS22EPGL201.4	Design and analyse power dividers, couplers at microwave frequencies.

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DJS22EPGL202 Advanced Wireless Communication Networks Laboratory	
At the end of course, a student will be able to:	
DJS22EPGL202.1	To gain an in-depth knowledge of various Wireless Propagation Models
DJS22EPGL202.2	Extrapolate the importance compression, spread spectrum, filter design for Wireless Networks.

DJS22OPGC231 Machine Learning	
At the end of course, a student will be able to:	
DJS22OPGC231.1	Analyze the applications, which can use Machine Learning Techniques
DJS22OPGC231.2	Understand and Apply regression, classification and clustering methods to the database.
DJS22OPGC231.3	Interpret the difference between supervised and unsupervised learning methods.
DJS22OPGC231.4	Understand the working of Reinforcement learning.
DJS22OPGC231.5	Understand basic concepts of Genetic Algorithms.

DJ22OPGC232 Renewable Energy	
At the end of course, a student will be able to:	
DJ22OPGC232.1	Identify sustainable energy solutions for sustainable development
DJ22OPGC232.2	Analyze renewable energy resources availability and utilization
DJ22OPGC232.3	Demonstrate competency in renewable systems analysis independently

DJS22OPGC233 Digital Marketing	
At the end of course, a student will be able to:	
DJS22OPGC233.1	Apply B2B and B2C contexts to plan content marketing
DJS22OPGC233.2	Develop and measure impact of content that works well for your target audience
DJS22OPGC233.3	Manage social media presence, and create effective content for each platform.
DJS22OPGC233.4	Optimize search engine presence through on-site and off-site activities, develop target keyword list, optimize website UX and design, and execute a link building campaign.
DJS22OPGC233.5	Create, execute, and optimize an effective Ad campaign. Display and set up advertising works.
DJS22OPGC233.6	Create an email marketing strategy, create and execute email campaigns, and measure the results.

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DJS22OPGC234 Project Management	
At the end of course, a student will be able to:	
DJS22OPGC234.1	Assess a project by establishing a business case and accordingly prepare a project proposal.
DJS22OPGC234.2	Develop a project plan
DJS22OPGC234.3	Identify task inter-dependencies, construct and analyze a network diagram
DJS22OPGC234.4	Monitor and control the performance of the project
DJS22OPGC234.5	Demonstrate Team work and team spirit and resolve conflicts

DJS22OPGC235 Research Methodology	
At the end of course, a student will be able to:	
DJS22OPGC235.1	Understand research concepts, types, significance and importance of research profile.
DJS22OPGC235.2	Prepare a preliminary research design for projects in their subject matter areas.
DJS22OPGC235.3	Accurately collect, analyze and report data
DJS22OPGC235.4	Review and analyze research findings.
DJS22OPGC235.5	Prepare the research report.

DJS22OPGC236 Product Life Cycle Management	
At the end of course, a student will be able to:	
DJS22OPGC236.1	Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation
DJS22OPGC236.2	Illustrate various approaches and techniques for designing and developing products
DJS22OPGC236.3	Understand the need for Product Life Cycle Assessment (LCA) and Life Cycle Cost Analysis.
DJS22OPGC236.4	Demonstrate the various PLM Applications, Modules, and virtual product development tools for components, machining and manufacturing plant.
DJS22OPGC236.5	Appreciate the significant effect of effective marketing strategies and integration of PLM with other business modules.

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S. Y. Tech. Semester III Course Outcomes

DJS22ITC301& DJS22ITT301 Discrete Structures

On completion of the course, learner will be able to:	
DJS22ITC301.1	Formulate and solve problems using set theory and use logical equivalence to understand and apply statements for solving problems.
DJS22ITC301.2	Understand the concepts of relations and functions which is required for further topics.
DJS22ITC301.3	Apply concepts of lattice and counting techniques to solve problems
DJS22ITC301.4	Apply the concept of groups for encoding and decoding binary data.

DJS22ITC302 & DJS22ITC302 Data Structures

On completion of the course, learner will be able to:	
DJS22ITC302.1	Understand the concept of time and space complexity for algorithms
DJS22ITC302.2	Assimilate the concept of various linear and non-linear data structures.
DJS22ITC302.3	Solve the problem using appropriate data structure.
DJS2ITC302.4	Implement appropriate searching and sorting technique for a given problem

DJS22ITC303 &DJS22ITL303 Database Management System

On completion of the course, learner will be able to:	
DJS22ITC303.1	Design an optimized database.
DJS22ITC303.2	Construct SQL queries to perform operations on the database.
DJS22ITC303.3	Demonstrate appropriate transaction management and recovery techniques for a given problem.
DJS22ITC303.4	Apply indexing mechanisms for efficient retrieval of information from database.

DJS22ITC304 & DJS22ITL304 Logic Design and Computer Architecture

On completion of the course, learner will be able to:	
DJS22ITC301.1	Design combinational circuits.
DJS22ITC301.2	Design sequential circuits.
DJS22ITC301.3	Understand the architecture and functionality of central processing unit.

DJS22ITC305 & DJS22ITL305 Operating System

On completion of the course, learner will be able to:	
DJS22ITC305.1	Understand the role of Operating System in terms of process, memory, file and I/O management.
DJS22ITC305.2	Apply appropriate process scheduling, memory mapping and disk scheduling methods.
DJS22ITC305.3	Identify the need of concurrency and apply the appropriate method to solve the concurrency or deadlock problem.

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DJS22ITC305.4	Apply and analyse different techniques of file and I/O management.

DJS22ITL306 Advanced Java Programming Laboratory

On completion of the course, learner will be able to:	
DJS22ITC306.1	Modify the behavior of methods, classes, and interfaces at runtime.
DJS22ITC306.2	Develop enterprise applications.

DJS22ITL307 Web Programming Laboratory

On completion of the course, learner will be able to:	
DJS22ITC307.1	Develop web applications.
DJS22ITC307.2	Work effectively as a member of a team.

DJS22ILLA1 Innovative Product Development I

On completion of the course, learner will be able to:	
DJS22ILLA1.1	To acquaint the students with the process of identifying the need (considering a societal requirement) and ensuring that a solution is found out to address the same by designing and developing an innovative product.
DJS22ILLA1.2	To familiarize the students with the process of designing and developing a product, while they work as part of a team.
DJS22ILLA1.3	To acquaint the students with the process of applying basic engineering fundamentals, so as to attempt at the design and development of a successful value added product.
DJS22ILLA1.4	To inculcate the basic concepts of entrepreneurship and the process of self-learning and research required to conceptualize and create a successful product.

DJS22A2 Constitution of India

On completion of the course, learner will be able to:	
DJS22A2.1	To provide basic information about Indian constitution.
DJS22A2.2	To identify individual role and ethical responsibility towards society.
DJS22A2.3	To understand human rights and its implications.

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S. Y. B. Tech. Semester IV Course Outcomes

DJS22ITC401 & DJS22ITT401 Applied Mathematics

On completion of the course, learner will be able to:	
DJS22ITC401.1	Apply the concept of Cayley-Hamilton Theorem on problems of linear equations and to understand the concept of eigen values and vectors.
DJS22ITC401.2	Interpret the concepts of divisibility, prime number, congruence and number theorems and practice on linear congruence and quadratic linear congruence.
DJS22ITC401.3	Explain the concept of a random variable and the probability distributions.
DJS22ITC401.4	Use the simplex method and its variations to solve linear programming models, given a basic feasible point.

DJS22ITC402 & DJS22ITT402 Formal Languages and Automata Theory

On completion of the course, learner will be able to:	
DJS22ITC402.1	Design formal grammar.
DJS22ITC402.2	Design computational model.
DJS22ITC402.3	Apply rigorously formal mathematical methods to prove properties of formal languages.
DJS22ITC402.4	Prove that the certain languages are undecidable.

DJS22ITC403 & DJS22ITL403 Design and Analysis of Algorithms

On completion of the course, learner will be able to:	
DJS22ITC403.1	Analyze the performance of algorithms using asymptotic analysis.
DJS22ITC403.2	Solve the problem using appropriate algorithmic design techniques.
DJS22ITC403.3	Able to prove that certain problems are NP-Complete.

DJS22ITC404 & DJS22ITL404 Computer Networks

On completion of the course, learner will be able to:	
DJS22ITC404.1	Analyze the different types of topologies, network devices and their functions within a network.
DJS22ITC404.2	Analyze key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP and OSI.

DJS22ITL405 Python Programming Laboratory

On completion of the course, learner will be able to:	
DJS22ITL405.1	Develop application with a clean coding standard..
DJS22ITL405.2	Implement basic Machine Learning and Data Science Techniques with visualizations.
DJS22ITL405.3	Work effectively as a member of a team.

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DJS22IHC1 & DJS22IHT1 Universal Human Values

On completion of the course, learner will be able to:

DJS22IHC1.1	Development of a holistic perspective based on self-exploration about themselves (human being), family, society, and nature/existence.
DJS22IHC1.2	Become sensitive to their commitment towards what they have understood (human values, human relationship, and human society).
DJS22IHC1.3	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

DJS22A3 Environmental Studies

On completion of the course, learner will be able to:

DJS22A3.1	Understand environmental issues such as depleting resources, pollution, ecological problems and the renewable energy scenario.
DJS22A3.2	Familiarize environment related legislation

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T. Y. B. Tech. Semester-V Course Outcome

DJ19ITC501 Cryptography and Network Security

Outcomes: On completion of the course, learner will be able to:

DJ19ITC501.1	Design a secure system using appropriate mechanism

DJ19ITC502 Advanced Data Structures

Outcomes: On completion of the course, learner will be able to:

DJ19ITC502.1	Carry out amortized Analysis of algorithms.
DJ19ITC502.2	Solve a problem using appropriate data structure.

DJ19ITC503 Data Warehousing and Mining

Outcomes: On completion of the course, learner will be able to:

DJ19ITC503.1	Design a data warehouse models using dimension-modeling techniques.
DJ19ITC503.2	Analyze the data by applying Online Analytical Processing (OLAP) operations forstrategic decisions.
DJ19ITC503.3	Apply preprocessing techniques for a given raw data.
DJ19ITC503.4	Apply appropriate data mining techniques on data sets to retrieve relevant information.
DJ19ITC503.5	Work effectively as a member of the team.

DJ19ITC504 Artificial Intelligence

Outcomes: On completion of the course, learner will be able to:

DJ19ITC504.1	Solve the problem using appropriate AI techniques.
DJ19ITC504.2	Apply NLP techniques on domain specific problems.
DJ19ITC504.3	Work effectively as a member of the team.

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DJ19ITC505 Professional and Business Communication Laboratory

Outcomes: On completion of the course, learner will be able to:

DJ19ITC505.1	Plan, organize and write technical documents like reports, proposals and research papersin the prescribed format using appropriate language and style with an understanding of ethics in written communication.
DJ19ITC505.2	Apply techniques of writing resume, participating in a group discussion and facinginterviews.
DJ19ITC505.3	Develop interpersonal skills in professional and personal situations.
DJ19ITC505.4	Understand the documentation process of meetings and conduct meetings in a professional manner.
DJ19ITC505.5	Understand communication across cultures and work ethics.
DJ19ITC505.6	Design and deliver effective presentations using Power Point

DJ19ITEC5011 Microcontrollers and Embedded Systems

Outcomes: On completion of the course, learner will be able to:

DJ19ITEC5011.1	Write assembly program for 8051
DJ19ITEC5011.2	Write assembly program for ARM 7.
DJ19ITEC5011.3	Design interfacing for 8051 microcontroller.
DJ19ITEC5011.4	Prioritize tasks in a real-time system using appropriate scheduling algorithms.
DJ19ITEC5011.5	Develop solutions for real world problems using appropriate embedded boards.

DJ19ITEC5012 Human Computer Interaction

Outcomes: On completion of the course, learner will be able to:

DJ19ITEC5012.1	Develop user interface using appropriate HCI design principles.
DJ19ITEC5012.2	Evaluate user interface design.
DJ19ITEC50123	Perform empirical research.
DJ19ITEC5012.4	Work effectively as a member of the team.

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DJ19ITEC5013: Statistical Analysis

Course Outcomes: On completion of the course, learner will be able to:

DJ19ITEC5013.1	Summarize data using suitable diagrams.
DJ19ITEC5013.2	Perform Test of Hypothesis based on independence.
DJ19ITEC5013.3	Perform test of hypothesis for goodness of fit.
DJ19ITEC5013.4	Estimate confidence interval for a population parameter.
DJ19ITEC5013.5	Estimate relationship between two or more variables using appropriate model.

DJ19ILL1 Innovative Product Development-III

Course Outcomes: On completion of the course, learner will be able to:

DJ19ILL1.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL1.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJ19ILL1.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL1.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product.
DJ19ILL1.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ19ILL1.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare them to be successful entrepreneurs.
DJ19ILL1.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication

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T. Y. B. Tech. Semester VI Course Outcomes

DJ19ITC601 Parallel and Distributed Computing

Course Outcomes: On completion of the course, student should be able to:

DJ19ITC601.1	Develop parallel computing solutions to a given problem.
DJ19ITC601.2	Develop distributed applications.
DJ19ITC601.3	Suggest appropriate cloud computing solutions.

DJ19ITC602 Software Engineering

Course Outcomes: On completion of the course, student should be able to:

DJ19ITC602.1	Select suitable software development lifecycle model(s) for software development.
DJ19ITC602.2	Analyze real world problem using software engineering principles.
DJ19ITC602.3	Work effectively as a member of the team

DJ19ITC603 Image Analysis and Computer Vision

Course Outcomes: On completion of the course, student should be able to:

DJ19ITC603.1	Describe fundamentals of computing on images.
DJ19ITC603.2	Apply suitable processing techniques on image.
DJ19ITC603.3	Apply motion analysis on real time problem
DJ19ITC603.4	Build a computer vision application with team members to solve real-time problems.
DJ19ITC603.5	Work effectively as a member of the team.

DJ19ITEC6011 Internet of Things

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC6011.1	Develop IoT applications using suitable enabler technologies.
DJ19ITEC6011.2	Analyze IoT application data stored on cloud.
DJ19ITEC6011.3	Work effectively as a member of the team.

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DJ19ITEC6012 UI/UX

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC6012.1	Identify user requirements.
DJ19ITEC6012.2	Design UI/UX using appropriate methods.
DJ19ITEC6012.3	Generate test report using usability testing.
DJ19ITEC6012.4	Work effectively as a member of the team.

DJ19ITEC6013 Big Data Analytics

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC6013.1	Identify big data applications using its characteristics.
DJ19ITEC6013.2	Explore Hadoop Ecosystem with their roles to solve Big Data problems.
DJ19ITEC6013.3	Apply advanced data mining algorithm for big data analytics

DJ19ITEC6014 Soft Computing

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC6013.1	Analyse a real-life problem.
DJ19ITEC6013.2	Solve real-life problem using appropriate soft computing technique(s)

DJ19ITEC6015 Infrastructure Security

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC6015.1	Evaluate the impact of cybersecurity threats for critical infrastructure protection.
DJ19ITEC6015.2	Apply appropriate security policies and mitigation techniques for protecting the infrastructure components.

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DJ19ITEC6016 Information Systems & IT Governance
Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC6016.1	Identify the necessary support an information system can provide to each functional area of the organization.
DJ19ITEC6016.2	Evaluate the IT investment process.
DJ19ITEC6016.3	Assess IT investment decisions as per the goals and strategies of the organization.

DJ19ILL2 Innovative Product Development-IV
Course Outcomes: On completion of the course, student should be able to:

DJ19ILL2.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL2.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJ19ILL2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL2.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product.
DJ19ILL2.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ19ILL2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare them to be successful entrepreneurs.
DJ19ILL2.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication

DJ19A5 Environmental Studies
Course Outcomes: On completion of the course, student should be able to:

DJ19A5.1	Understand how human activities affect environment
DJ19A5.2	Understand the various technology options that can make a difference

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B. Tech. Semester-VII Course Outcomes

DJ19ITC701 Service Oriented Architecture

Course Outcomes: On completion of the course, student should be able to:

DJ19ITC701.1	Create web services using development tools.
DJ19ITC701.2	Build SOA-based solutions for intra-enterprise and inter-enterprise applications.

DJ19ITC702 Design Thinking

Course Outcomes: On completion of the course, student should be able to:

DJ19ITC702.1	Develop a holistic application using Design Thinking Principles.
DJ19ITC702.2	Work efficiently as a team member.

DJ19ITEC7011 Wireless Sensor Network

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC7011.1	Specify the requirements for the hardware and software solutions for energy-efficient sensor network,
DJ19ITEC7011.2	Analyze various critical parameters in deploying a WSN.
DJ19ITEC7011.3	Apply appropriate algorithms to improve existing or to develop new WSN applications
DJ19ITEC7011.4	Design a WSN for given sensor data using microcontroller, transceiver, middleware and operating system.
DJ19ITEC70115	Work effectively as a member of a team.

DJ19ITEC7012 Augmented and Virtual Reality

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC7012.1	Develop Virtual Reality applications.
DJ19ITEC7012.2	Develop Augmented Reality applications
DJ19ITEC7012.3	Work effectively as a member of a team.

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DJ19ITEC7013 Business Analytics
Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC7013.1	Apply business intelligence methods to various situations.
DJ19ITEC7013.2	Interpret the results
DJ19ITEC7013.3	Identify a problem or an opportunity by taking appropriate courses of action for a given managerial situation.

DJ19ITEC7014 Machine Learning
Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC7014.1	Solve real-world problems using suitable machine learning techniques

DJ19ITEC7015 Blockchain Technology
Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC7015.1	Survey different blockchain platforms, their architectures and applications.
DJ19ITEC7015.2	Develop smart contracts on Ethereum framework using solidity language
DJ19ITEC7015.3	Analyze the real-world problems that can be solved using blockchain technology.

DJ19ITP704 Project-I
Course Outcomes: On completion of the course, student should be able to:

DJ19ITP704.1	Discover potential research areas in the field of IT.
DJ19ITP704.2	Survey several available literatures in the related field of study.
DJ19ITP704.3	Compare the several existing solutions for research challenges.
DJ19ITP704.4	Design the solution for the research plan.
DJ19ITP704.5	Summarize the findings of the study conducted.
DJ19ITP704.6	Work effectively as a member of the team.

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B. Tech. Semester-VIII Course Outcomes

DJ19ITC801 Semantic Web Technology

Course Outcomes: On completion of the course, student should be able to:

DJ19ITC801.1	Model ontologies using Resource Description Framework (RDF) and Web Ontology Language (OWL).
DJ19ITC801.2	Query ontologies using SPARQL.
DJ19ITC801.3	Apply Semantic web technologies to real world applications

DJ19ITC802 Design Patterns

Course Outcomes: On completion of the course, student should be able to:

DJ19ITC802.1	Identify and apply the most suitable design pattern to address a given application design problem

DJ19ITEC8011 Industrial Internet of Things

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC8011.1	Explore Industry 4.0 and IIoT technologies, architectures, standards, and protocols
DJ19ITEC8011.2	Examine the technological developments that will shape the industrial landscape in the future.
DJ19ITEC8011.3	Work effectively as a member of team.

DJ19ITEC8012 Game Design & Gamification

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC8012.1	Design games using gamification principles.
DJ19ITEC8012.2	Work effectively as a member of a team.

DJ19ITEC8013 Predictive Analytics

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC8013.1	Apply prediction modeling techniques to turn data into actionable insights.
DJ19ITEC8013.2	Select a suitable model to carry out the prediction.

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DJ19ITEC8014 Advanced Machine Learning

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC8014.1	Develop an appropriate machine learning model.
DJ19ITEC8014.2	Apply optimization techniques to real world problems.
DJ19ITEC8014.3	Work efficiently as a part of a team.

DJ19ITEC8015 Advanced Security

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC8015.1	Perform appropriate surveillance of IT infrastructure for vulnerabilities.
DJ19ITEC8015.2	Describe how Security Operations Centers (SOC) work as a valuable resource for security incident detection.
DJ19ITEC8015.3	Analyze cybersecurity incidents.
DJ19ITEC80154	Reconstruct the series of events using suitable Incident Response (IR) process.

DJ19ITEC8016 Quantum Computing

Course Outcomes: On completion of the course, student should be able to:

DJ19ITEC8016.1	Design quantum circuits.
DJ19ITEC8016.2	Implement quantum algorithms.

DJ19ITP803 Project-II

Course Outcomes: On completion of the course, student should be able to:

DJ19ITP803.1	Develop the proposed solution using appropriate techniques.
DJ19ITP803.2	Test the developed system for its correctness using appropriate techniques.
DJ19ITP803.3	Work effectively as a member of the team
DJ19ITP803.4	Students will evaluate text processing techniques and operations in information retrieval system.
DJ19ITP803.5	Students will demonstrate and evaluate various indexing and searching techniques.
DJ19ITP803.6	Student will design the user interface for an information retrieval system.

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S. Y. B. Tech. Semester III Course Outcomes

DJS22MEC301 & DJS22MET301 Engineering Mathematics-III

On completion of the course, learner will be able to:	
DJS22MEC301.1	Use Laplace and inverse Laplace Transform to solve the Ordinary Differential Equations.
DJS22MEC301.2	Identify analytic and harmonic functions
DJS22MEC301.3	Solve real integrals using complex integration.
DJS22MEC301.4	Find the Fourier Series of periodic functions and simplify infinite series.
DJS22MEC301.5	Solve certain partial differential equations analytically and numerically
DJS22MEC301.6	Correlate different variables of data

DJS22MEC302 Engineering Thermodynamics

On completion of the course, learner will be able to:	
DJS22MEC302.1	Demonstrate application of the first law of thermodynamics to flow and non-flow system.
DJS22MEC302.2	Analyze thermodynamic cycles including vapour power cycles, refrigeration cycles, and heat-pump
DJS22MEC302.3	Use thermodynamic relations in the evaluation of thermodynamic properties.
DJS22MEC302.4	Use steam table and Mollier chart to compute thermodynamics interactions.
DJS22MEC302.5	Evaluate the performance of air standard cycles
DJS22MEC302.6	Evaluate the performance of single stage and multi stage compress

DJS22MEC303 & DJS22MEL303 (Mechanics of Materials & Mechanics of Materials Laboratory)

On completion of the course, learner will be able to:	
DJS22MEC303.1	Evaluate stresses, strains, deformation, and properties of materials in mechanical components/ structures.
DJS22MEC303.2	Draw SFD and BMD for several types of loads and support conditions for a beam.
DJS22MEC303.3	Compute and plot direct, bending and shear stresses across sections of a given beam.
DJS22MEC303.4	Compute torsional shear stresses and strain energy in mechanical components.
DJS22MEC303.5	Compute deflections and slopes in beams
DJS22MEC303.6	Analyze buckling phenomenon in columns and struts.

DJS22MEC304 Manufacturing Processes

On completion of the course, learner will be able to:	
DJS22MEC304.1	Describe types of machine tools, their classification, specifications, and constructional features, with machining operations to generate cylindrical, and planar components.
DJS22MEC304.2	Identify various metal casting processes, analyze various defects, their probable causes and remedial measures confronted with metal casting.
DJS22MEC304.3	Identify various metal forming, analyze various defects, their probable causes and remedial measures confronted with metal forming

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DJS22MEC304.4	Identify sheet metal operations to build the concepts pertaining to press tools.
DJS22MEC304.5	Calculate various forces, velocities, shear angle, strain, shear stress and power consumption in meta cutting operation
DJS22MEC304.6	Describe various power metallurgy techniques and various polymeric composite manufacturing techniques.

DJS22MEL305 Computer Aided Machine Drawing lab

On completion of the course, learner will be able to:	
DJS22MEL305.1	Visualize and prepare detailed drawing of a given object.
DJS22MEL305.2	Read and interpret the drawing
DJS22MEL305.3	Draw the details and assemblies of different mechanical systems.
DJS22MEL305.4	Convert detailed drawing into assembly drawing using modelling software
DJS22MEL305.5	Convert assembly drawing into detailed drawing using modelling software
DJS22MEL305.6	Prepare a detailed drawing of any given physical object / machine element with actual measurements

DJS22MEL306 Manufacturing Process Laboratory

On completion of the course, learner will be able to:	
DJS22MEL306.1	Demonstrate precautions and safety norms followed in Machine Shop and exhibit interpersonal skills towards working in a team.
DJS22MEL306.2	Understand the construction, working and operation of various conventional machine tools, and various accessories and attachments used. Select cutting parameters like cutting speed, feed, depth of cut, and tooling for various machining operations.
DJS22MEL306.3	Read working drawings, understand operational symbols and execute machining operations.
DJS22MEL306.4	Perform various operations such as plain turning, taper turning, step turning, thread cutting, facing, knurling, internal thread cutting, eccentric turning and estimate cutting time.
DJS22MEL306.5	Perform machining operations such as plain shaping, inclined shaping, keyway cutting, Indexing and Gear cutting and estimate cutting time.
DJS22MEL306.6	Summarize the importance of grinding and super finishing operations.

DJS22IHC1& DJS22IHT1 (Universal Human Values & Universal Human Values Tutorial)

On completion of the course, learner will be able to:	
DJS22IHC1.1	Development of a holistic perspective based on self-exploration about themselves (human being), family, society, and nature/existence.
DJS22IHC1.2	Understanding (or developing clarity) of the harmony in the human being, family, society, and nature/existence.
DJS22IHC1.3	Strengthening of self-reflection.
DJS22IHC1.4	Development of commitment and courage to act.

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DJS22MEL307 Python for Mechanical Engineering Laboratory

On completion of the course, learner will be able to:	
DJS22MEL307.1	Understand the coding environment of Python software
DJS22MEL307.2	Understand the basics of Python
DJS22MEL307.3	To read, analyze, and visualize data.
DJS22MEL307.4	To apply the python skills for Mechanical problems.

DJS22A2 Innovative Product Development I

On completion of the course, learner will be able to:	
DJS22A2.1	Identify the requirement for a product based on societal/research needs
DJS22A2.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team
DJS22A2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product
DJS22A2.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product.
DJS22A2.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJS22A2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJS22A2.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication. Guidelines

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S. Y. B. Tech. Semester IV Course Outcomes

DJ19MEC401 & DJ19MET401 Engineering Mathematics-IV

On completion of the course, learner will be able to:	
DJ19MEC401.1	Identify diagonalizable and derogatory matrices and find functions as a square matrix using eigenvalues and eigenvectors.
DJ19MEC401.2	Understand concepts of solenoidal and conservative fields. Evaluate vector integrals.
DJ19MEC401.3	Use probability to solve real-life engineering problems.
DJ19MEC401.4	Draw conclusions on population based on large and small samples taken. Analyze the variances of multiple variables simultaneously.

DJ19MEC402 & DJ19MEL402 (Fluid Mechanics & Fluid Mechanics Laboratory)

On completion of the course, learner will be able to:	
DJ19MEC402 .1	Explain the key fluid properties, calculate the pressure, hydrostatic pressure force, buoyant force and discuss the stability of floating or submerged bodies.
DJ19MEC402 .2	Identify various flow characteristics based on the velocity field and determine the streamline pattern and acceleration field given a velocity field.
DJ19MEC402 .3	Explain the development, uses, and limitations of the Bernoulli equation and apply the Reynolds transport theorem and the material derivative, analyze certain types of flows using the Navier–Stokes equations.
DJ19MEC402 .4	Identify and understand various characteristics of the flow in pipes, calculate losses in straight portions of pipes as well as those in various pipe system components, apply appropriate equations and principles to analyze a variety of pipe flow situations.
DJ19MEC402 .5	Explain the fundamental characteristics of a boundary layer, including laminar, transitional, and turbulent regimes, calculate boundary layer parameters for flow past a flat plate, provide a description of boundary layer separation.
DJ19MEC402 .6	Understand some important features of different categories of compressible flows of ideal gases, solve useful problems involving isentropic and non-isentropic flows including flows across normal shock waves

DJS22MEC403 & DJS22MEL403 (Kinematics of Machinery & Kinematics of Machinery Laboratory)

On completion of the course, learner will be able to:	
DJS22MEC403.1	Apply the principles of kinetics to solve problems involving rigid bodies
DJS22MEC403.2	Explain the working of various mechanisms and machines.
DJS22MEC403.3	Determine the velocity and acceleration of the mechanism links.
DJS22MEC403.4	Sketch motion graphs for a given follower motion
DJS22MEC403.5	Determine basic design parameters of belt drives and chain drives.
DJS22MEC403.6	Determine basic design parameters of gears and gear trains.

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DJS22MEC404 & DJS22MEL404 (Engineering Materials & Materials Testing Laboratory)

On completion of the course, learner will be able to:	
DJS22MEC404.1	Classify engineering materials and illustrate related fundamental concepts such crystal structure, structure-property-processing-performance correlation, crystal defects, deformation mechanism and strengthening mechanisms.
DJS22MEC404.2	Identify and comprehend failure modes of engineering materials and related issues.
DJS22MEC404.3	Describe alloys and alloy phase diagrams, Iron-Iron Carbide based phase diagram, Microstructural development in steels and cast iron and demonstrate the application of phase rule and lever rule.
DJS22MEC404.4	Select and justify the proper heat treatment process and alloying elements for steel in order to obtain desirable properties to suit application requirements
DJS22MEC404.5	Recognize the need for modern new age materials to cater the engineering application demands

DJS22MEC405 Advanced Manufacturing Processes

On completion of the course, learner will be able to:	
DJS22MEC405.1	Understand the fundamentals of various non-conventional machining processes, and their capabilities with their application areas.
DJS22MEC405.2	Understand MEMS and Non-MEMS based manufacturing techniques
DJS22MEC405.3	Understand the various Nano finishing techniques
DJS22MEC405.4	Reviewing the difference between traditional and additive manufacturing techniques
DJS22MEC405.5	Understand and apply the fundamental principles of various Additive Manufacturing (AM) technologies in solid based, liquid-based and powder-based techniques.

DJS22MEC406 & DJS22MEL406 (Mechanical Measurements and Metrology & Mechanical Measurements and Metrology Laboratory)

On completion of the course, learner will be able to:	
DJS22MEC406.1	Classify various types of static characteristics and types of errors occurring in the system.
DJS22MEC406.2	Classify and select proper measuring instrument for displacement, strain, pressure and temperature measurement
DJS22MEC406.3	Classify and select proper measuring instrument for linear and angular measurement
DJS22MEC406.4	Demonstrate inspection methods and design of different limit gauges.
DJS22MEC406.5	Demonstrate characteristics of surface texture, screw threads, and gear measurements.

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DJS22MEL407 Advance Manufacturing Processes Laboratory

On completion of the course, learner will be able to:	
DJS22MEL407.1	Demonstrate the various CNC control and calculate technological data for CNC machining.
DJS22MEL407.2	Prepare programs, demonstrate, simulate, and operate CNC machines for various machining operations
DJS22MEL407.3	Apply engineering knowledge, techniques, and modern tools to analyze problems in additive manufacturing
DJS22MEL407.4	Develop a working model using additive manufacturing (3D Printing) Processes.
DJS22MEL407.5	Engage in lifelong learning adhering to professional, ethical, legal, safety, environmental and societal aspects for career excellence.

DJS22A3 Constitution of India

On completion of the course, learner will be able to:	
DJS22A3.1	Have general knowledge and legal literacy and thereby take up competitive examinations
DJS22A3.2	Understand state and central policies, fundamental duties
DJS22A3.3	Understand Electoral Process, special provisions.
DJS22A3.4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies
DJS22A3.5	Understand Engineering ethics and responsibilities of Engineers
DJS22A3.6	Understand Engineering Integrity & Reliability.

DJS22A4 Innovative Product Development II

On completion of the course, learner will be able to:	
DJS22A4.1	Identify the requirement for a product based on societal/research needs.
DJS22A4.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJS22A4.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJS22A4.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product.
DJS22A4.5	Develop interpersonal skills, while working as a member of the team or as the leader
DJS22A4.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs
DJS22A4.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication

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T. Y. B. Tech. Semester V Course Outcomes

DJ19MEC501 & DJ19MEL501 (Automotive Prime Movers & Automotive Prime Movers Laboratory

On completion of the course, learner will be able to:	
DJ19MEC501.1	Explain the construction and working of internal combustion engines.
DJ19MEC501.2	Demonstrate the working systems of spark ignition & compression ignition engines.
DJ19MEC501.3	Demonstrate the engine cooling, lubrication and super-charging systems.
DJ19MEC501.4	Analyse various engine performance parameters.
DJ19MEC501.5	Describe the different hybrid and electric powertrain systems.

DJ19MEL502 & DJ19MEL502 (Heat Transfer & Heat Transfer Laboratory)

On completion of the course, learner will be able to:	
DJ19MEL502.1	Explain the mechanism of heat transfer by conduction and analyse various types of one dimensional heat conduction problems.
DJ19MEL502.2	Explain the mechanism of heat transfer by convection and analyse free and forced convection problems.
DJ19MEL502.3	Find the rate of heat transfer by radiation and analyse the effect of radiation shield in radiation exchange between two surfaces.
DJ19MEL502.4	Explain different types of heat exchangers and analyse heat exchanger using LMTD & NTU method.

DJ19MEC503 & DJ19MEL503 (Mechanical Vibrations & Mechanical Vibrations Laboratory)

On completion of the course, learner will be able to:	
DJ19MEC503.1	Develop mathematical model to represent dynamic system 2
DJ19MEC503.2	Evaluate natural frequency of mechanical element / system
DJ19MEC503.3	Analyze response of mechanical element / system, executing free and forced vibration
DJ19MEC503.4	Estimate the values of various elements of vibrating systems, required to achieve vibration isolation and control
DJ19MEC503.5	Analyze working of vibration measuring instruments

DJ19MEC504 & DJ19MEL504 (Industrial Electronics and Control & Industrial Electronics and Control Laboratory)

On completion of the course, learner will be able to:	
DJ19MEC504.1	Illustrate construction, working principles and applications of power electronic switches
DJ19MEC504.2	Identify rectifiers and inverters for dc and ac motor speed control
DJ19MEC504.3	Develop circuits using OPAMP and timer IC555
DJ19MEC504.4	Identify digital circuits for industrial applications
DJ19MEC504.5	Design mathematical model of system/process for standard input responses
DJ19MEC504.6	Analyze error and differentiate various types of control systems and time domain

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DJ19MEC5011 Machine Tool Engineering

On completion of the course, learner will be able to:	
DJ19MEC5011.1	Analyse various single and multipoint cutting tools with tool nomenclature as per standards and their design principles.
DJ19MEC5011.2	Analyse tool life and economics of machining.
DJ19MEC5011.3	Understand design principles of press tool components for piercing and blanking operation.
DJ19MEC5011.4	Illustrate design principles of press tool components in bending and drawing operation.
DJ19MEC5011.5	Understand appropriate combination of tools, jigs and fixture, suitable for a particular machining operation.

DJ19MEC5012 Renewable Energy Systems

On completion of the course, learner will be able to:	
DJ19MEC5012.1	Explain the need of different renewable energy sources.
DJ19MEC5012.2	Discuss importance of renewable energy sources.
DJ19MEC5012.3	Discuss various renewable energy sources in Indian context.
DJ19MEC5012.4	Calculate and analyse utilization of solar and wind energy.
DJ19MEC5012.5	Illustrate design of biogas plant.
DJ19MEC5012.6	Explain basics of hydrogen energy

DJ19MEC5013 Quality Engineering

On completion of the course, learner will be able to:	
DJ19MEC5013.1	Explain the importance of Quality for survival and growth of any business.
DJ19MEC5013.2	Prepare and interpret the control charts for variables and attributes.
DJ19MEC5013.3	Evaluate Process capability and determine tolerance limits.
DJ19MEC5013.4	Apply ANOVA test and determine the degree of relation between independent variables.
DJ19MEC5013.5	Elaborate significance of quality and application of Six Sigma in service sector

DJ19MEL505 Python for Mechanical Engineering

On completion of the course, learner will be able to:	
DJ19MEL505.1	Understand the coding environment of Python software.
DJ19MEL505.2	Understand the basics of Python
DJ19MEL505.3	To read, analyse and visualize data.
DJ19MEL505.4	To apply the python skills for Mechanical problems

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DJ19IHL2 Professional and Business Communication Laboratory

On completion of the course, learner will be able to:	
DJ19IHL2.1	Plan, organize and write technical documents like reports, proposals and research papers in the prescribed format using appropriate language and style with an understanding of ethics in written communication
DJ19IHL2.2	Apply techniques of writing resume, participating in a group discussion and facing interviews
DJ19IHL2.3	Develop interpersonal skills in professional and personal situations
DJ19IHL2.4	Understand the documentation process of meetings and conduct meetings in a professional manner
DJ19IHL2.5	Understand communication across cultures and work ethics
DJ19IHL2.6	Design and deliver effective presentations using Power Point
DJ19IHL2.7	

DJ19ILL1 Innovative Product Development III

On completion of the course, learner will be able to:	
DJ19ILL1.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL1.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJ19ILL1.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL1.4	Draw proper inferences through theoretical/ experimental/simulations and analyse the impact of the proposed method of design and development of the product.
DJ19ILL1.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ19ILL1.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJ19ILL1.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication

DJ19MEC601 & DJ19MEL601 (Machine Design I & Machine Design I Laboratory)

On completion of the course, learner will be able to:	
DJ19MEC601.1	Use design data books in designing various components.
DJ19MEC601.2	Illustrate basic principles of machine design.
DJ19MEC601.3	Demonstrate understanding of various design considerations, theories of failures, Standards/Codes.
DJ19MEC601.4	Design machine elements for static as well as dynamic loading.
DJ19MEC601.5	Design machine elements on the basis of strength/ rigidity concepts

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T. Y. B. Tech. Semester VI Course Outcomes

DJ19MEC602 & DJ19MEL602 (Refrigeration and Air Conditioning & Refrigeration and Air Conditioning Laboratory)

On completion of the course, learner will be able to:	
DJ19MEC602.1	Apply the fundamentals of thermodynamics to refrigeration systems and calculate the coefficient of performance of reversed Carnot cycle, Bell-Coleman cycle and Aircraft refrigeration systems.
DJ19MEC602.2	Analyse the vapour compression refrigeration systems, components and interpret the importance of refrigerant properties and its selection criteria.
DJ19MEC602.3	Analyse the psychometric properties, processes, charts and principles of air-conditioning.
DJ19MEC602.4	Design air-conditioning systems using cooling load calculations and duct design principles.
DJ19MEC602.5	Discuss the applications and controls of various refrigeration and air-conditioning systems

DJ19MEC603 & DJ19MEL603 (Mechatronics & Mechatronics Laboratory)

On completion of the course, learner will be able to:	
DJ19MEC603.1	Represent Mechatronics system with block diagrams
DJ19MEC603.2	Identify the suitable sensor and actuator for a given mechatronics system
DJ19MEC603.3	Distinguish and analyse various circuits for signal conditioning and their interfacing with microcontrollers
DJ19MEC603.4	Design hydraulic/pneumatic circuits
DJ19MEC603.5	Analyse continuous control logics (P, PI, PD and PID) for standard input conditions
DJ19MEC603.6	Develop ladder logic programming.

DJ19MEC604 & DJ19MEL604 (Power Engineering & Power Engineering Laboratory

On completion of the course, learner will be able to:	
DJ19MEC604.1	Understand working of different types of boilers and analyze steam generator, steam turbine performance.
DJ19MEC604.2	Explain basic concepts in the case of centrifugal compressors and analyze their performance.
DJ19MEC604.3	Describe working of axial flow compressors and analyze their performance.
DJ19MEC604.4	Explain basic difference between impulse and reaction water turbines, determine various parameters and design turbine runners.
DJ19MEC604.5	Describe operating principles of reciprocating and centrifugal pumps and evaluate their performance.

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DJMEC6011 Smart Materials

On completion of the course, learner will be able to:	
DJMEC6011.1	Understand working of smart materials and their application as actuator and sensor.
DJMEC6011.2	Select an appropriate smart material for a given application.
DJMEC6011.3	Identify applicability of smart materials for new prospective smart structures.

DJ19MEC6012 Design of Heat Exchanger Equipment

On completion of the course, learner will be able to:	
DJ19MEC6012.1	Classify different HX and understand the methodologies for its design.
DJ19MEC6012.2	Design double pipe HX
DJ19MEC6012.3	Design SHTX
DJ19MEC6012.4	Design Compact HX
DJ19MEC6012.5	Understand the heat transfer enhancement techniques and performance evaluation

DJ19MEC6013 Reliability Engineering

On completion of the course, learner will be able to:	
DJ19MEC6013.1	Apply the laws of Probability to engineering problems.
DJ19MEC6013.2	Analyze failure data and apply various reliability concepts to calculate different reliability parameters.
DJ19MEC6013.3	Evaluate the system reliability of simple and complex systems.
DJ19MEC6013.4	Apply redundancy techniques to improve the system Reliability.
DJ19MEC6013.5	Apply a Failure Mode Effect and Criticality Analysis, Fault tree analysis and Event tree analysis to analyze complex systems

DJ19MEL605 Database Management System Laboratory

On completion of the course, learner will be able to:	
DJ19MEL605.1	Understand the fundamentals of a database system and design an optimized database.
DJ19MEL605.2	Design and draw ER and EER diagram for the real-life problem.
DJ19MEL605.3	Create and populate a Relational Database and retrieve any type of information from the database by formulating SQL queries.
DJ19MEL605.4	Analyze and apply concepts of normalization to relational database design.
DJ19MEL605.5	Understand the concept of transaction, concurrency and recovery.

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DJ19ILL2 Innovative Product Development IV

On completion of the course, learner will be able to:	
DJ19ILL2.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL2.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJ19ILL2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL2.4	Draw proper inferences through theoretical/ experimental/simulations and analyse the impact of the proposed method of design and development of the product.
DJ19ILL2.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ19ILL2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJ19ILL2.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication.

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B. Tech. Semester VII Course Outcomes

DJ19MEC701 & DJ19MEL701 (Machine Design –II & Machine Design -II Laboratory)

On completion of the course, learner will be able to:	
DJ19MEC701.1	Select appropriate gears for power transmission on the basis of given power and speed.
DJ19MEC701.2	Design gears based on the given conditions.
DJ19MEC701.3	Select bearings for a given application from the manufacturer's catalogue.
DJ19MEC701.4	Design the flywheel for given applications.
DJ19MEC701.5	Design cam and follower mechanisms.
DJ19MEC701.6	Design clutches and brakes.

DJ19MEC702 & DJ19MEL702 (Production Planning and Control & Production Planning and Control Laboratory)

On completion of the course, learner will be able to:	
DJ19MEC702.1	Summarize the basics of finite element analysis.
DJ19MEC702.2	Evaluate differential equations using weak and Non-weak form methods.
DJ19MEC702.3	Implement the basic finite element formulation techniques to solve one dimensional engineering problems using elements such as bar/beam/link element.
DJ19MEC702.4	Implement the basic finite element formulation techniques to solve two dimensional engineering problems using elements such as triangular and quadrilateral elements.
DJ19MEC702.5	Implement the basic finite element formulation techniques to find natural frequency of dynamic system.
DJ19MEC702.6	Use commercial FEA software, to solve problems related to mechanical engineering

DJ19MEC703 & DJ19MEL703 (Finite Element Analysis & Finite Element Analysis Laboratory)

On completion of the course, learner will be able to:	
DJ19MEC703.1	Summarize the basics of finite element analysis.
DJ19MEC703.2	Evaluate differential equations using weak and Non-weak form methods.
DJ19MEC703.3	Implement the basic finite element formulation techniques to solve one dimensional engineering problems using elements such as bar/beam/link element.
DJ19MEC703.4	Implement the basic finite element formulation techniques to solve two dimensional engineering problems using elements such as triangular and quadrilateral elements.
DJ19MEC703.5	Implement the basic finite element formulation techniques to find natural frequency of dynamic system.
DJ19MEC703.6	Use commercial FEA software, to solve problems related to mechanical engineering.

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DJ19MEC7011 Additive Manufacturing

On completion of the course, learner will be able to:	
DJ19MEC7011.1	Understand importance of Rapid Prototyping in product development.
DJ19MEC7011.2	Apply basic knowledge of additive manufacturing to decide type of additive manufacturing process and material according components design requirement.
DJ19MEC7011.3	To calculate and justify the cost of a typical additive manufacturing operation including labour costs, overhead costs, and consumable costs.
DJ19MEC7011.4	Evaluate the different post processing techniques used on AM parts, including those required for removal of support structures, improvement of surface characteristics and structural integrity.
DJ19MEC7011.5	Conduct research work and research writing in the field of additive manufacturing

DJ19MEC7012 Computational Fluid Dynamics

On completion of the course, learner will be able to:	
DJ19MEC7012.1	Explain the working of a CFD code
DJ19MEC7012.2	Understand the various Governing Equations
DJ19MEC7012.3	Understand turbulence modelling and various algorithms used in numerical techniques
DJ19MEC7012.4	Apply Finite Volume Method to solve numerical problems
DJ19MEC7012.5	Understanding the software used for simulation of numerical problems

DJ19MEC7013 Machine Health Monitoring Management

On completion of the course, learner will be able to:	
DJ19MEC7013.1	Understand basics of machine health monitoring management.
DJ19MEC7013.2	Apply basic Instrumentation and signal processing technique in machine health monitoring management.
DJ19MEC7013.3	Recognize pattern in problems involved in machine health monitoring.
DJ19MEC7013.4	Gain knowledge about the application of artificial intelligence techniques in Condition Monitoring
DJ19MEC7013.5	Gain knowledge about the application of Machine learning techniques in Condition Monitoring

DJ19MEC7014 Big Data Analytics

On completion of the course, learner will be able to:	
DJ19MEC7014.1	Understand the key issues in big data management.
DJ19MEC7014.2	Acquire fundamental enabling techniques using tools in big data analytics.
DJ19MEC7014.3	Achieve adequate perspectives of big data analytics in various applications like sensor, recommender systems, social media applications etc.

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DJ19MEC7015 Robotics

On completion of the course, learner will be able to:	
DJ19MEC7015.1	Demonstrate the basic functioning of a robot
DJ19MEC7015.2	Identify various components of robots
DJ19MEC7015.3	Carryout kinematic analysis, workspace analysis, and trajectory planning for a robot
DJ19MEC7015.4	Identify suitable sensors/actuators for robot
DJ19MEC7015.5	Select an appropriate robot for given industrial inspection and material handling systems.

DJ19MEC7016 Tribology

On completion of the course, learner will be able to:	
DJ19MEC7016.1	Apply the principles of lubrication, lubrication regimes, and theories of hydrodynamic, elasto-hydrodynamic and mixed / boundary lubrication.
DJ19MEC7016.2	Understand the principles of design considerations, principles of bearing selection and arrangement in machines.
DJ19MEC7016.3	Design of mechanical components from the aspect of friction, wear and lubrication.
DJ19MEC7016.4	Understand the principles for selecting compatible materials for minimizing friction and wear in machinery

DJ19MEC7017 Automobile Engineering

On completion of the course, learner will be able to:	
DJ19MEC7017.1	Describe the types and working of clutch and transmission system.
DJ19MEC7017.2	Illustrate the working of steering and braking systems.
DJ19MEC7017.3	Describe the role of vehicle suspension systems and vehicle body.
DJ19MEC7017.4	Describe the different automotive electrical systems.
DJ19MEC7017.5	Acquaint with recent developments in automobiles

DJ19MEP704 Project – I

On completion of the course, learner will be able to:	
DJ19MEP704.1	Apply basic engineering fundamentals in the domain of practical applications.
DJ19MEP704.2	Identify the engineering problems based on literature review.
DJ19MEP704.3	Attempt a problem solution with systematic approach and ethics.
DJ19MEP704.4	Develop the habit of working in a team, and communicate efficiently with engineering community and society.
DJ19MEP704.5	Apply the principles of project management and financial aspects in multidisciplinary environments.
DJ19MEP704.6	Recognize the need for lifelong learning activities to cope up with technological changes.

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B. Tech. Semester VIII Course Outcomes

DJ19MEC801 & DJ19MEL801 (Design of Mechanical Systems & Design of Mechanical Systems Laboratory)

On completion of the course, learner will be able to:	
DJ19MEC801.1	Design gearboxes for a given machine tool application.
DJ19MEC801.2	Design hoisting mechanism of an Electric overhead traveling crane.
DJ19MEC801.3	Design belt conveyor systems.
DJ19MEC801.4	Design engine components such as cylinder, piston, connecting rod and crankshaft.
DJ19MEC801.5	Design pumps for a given application.

DJ19MEC802 Industrial Engineering

On completion of the course, learner will be able to:	
DJ19MEC802.1	Illustrate the need for optimization of resources and its significance.
DJ19MEC802.2	Develop ability in integrating knowledge of design along with other aspects of value addition in the conceptualization and manufacturing stage of various products.
DJ19MEC802.3	Demonstrate the concept of value analysis and its relevance.
DJ19MEC802.4	Manage and implement different concepts involved in method study and understanding of work content in different situations.
DJ19MEC802.5	Describe different aspects of work system design and facilities design pertinent to manufacturing industries.
DJ19MEC802.6	Illustrate concepts of Agile manufacturing, Lean manufacturing and Flexible manufacturing

DJ19MEC803 & DJ19MEL803 (CAD/CAM/CIM & CAD/CAM/CIM Laboratory)

On completion of the course, learner will be able to:	
DJ19MEC803.1	Understand basics of computer graphics and computer modelling technique.
DJ19MEC803.2	Transform, manipulate objects and computer assisted generation of tool path
DJ19MEC803.3	Apply Artificial Intelligence concept to Design and manufacturing.
DJ19MEC803.4	Apply and replace conventional manufacturing process by additive manufacturing process
DJ19MEC803.5	Apply computer integrated machining for product design and manufacturing.

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DJ19MEC8011 Smart Industries

On completion of the course, learner will be able to:	
DJ19MEC8011.1	Understand the basic principles behind smart industry.
DJ19MEC8011.2	Identify smart industry key levers and drivers.
DJ19MEC8011.3	Understand the supporting technologies for Smart factories.
DJ19MEC8011.4	Learn from leading industries and develop smart factory roadmaps.

DJ19MEC8012 Energy Audit and Management

On completion of the course, learner will be able to:	
DJ19MEC8012.1	Know the present energy scenario, global environmental concern, and importance of sustainable energy management.
DJ19MEC8012.2	Analyze energy trends in energy intensive sectors and carry out energy action plan.
DJ19MEC8012.3	Understanding the energy economy of the energy intensive sectors.
DJ19MEC8012.4	Analyze the energy utilization in thermal and electrical utilities.
DJ19MEC8012.5	Evaluate the efficiency of boilers, steam systems, furnace, HVAC and refrigeration systems

DJ19MEC8013 Industrial Waste Management

On completion of the course, learner will be able to:	
DJ19MEC8013.1	Know the sources of pollution from industries.
DJ19MEC8013.2	Understand the characteristics of pollution.
DJ19MEC8013.3	Analyze the effects and hazardless of the industrial pollution.
DJ19MEC8013.4	Plan to minimize of industrial wastes.
DJ19MEC8013.5	Design facilities for the processing and reclamation of industrial waste water.

DJ19MEC8014 Big Data Analytics

On completion of the course, learner will be able to:	
DJ19MEC8014.1	Apply Base SAS programming.
DJ19MEC8014.2	Understand and demonstrate visual analytics.
DJ19MEC8014.3	Design the report using reporter
DJ19MEC8014.4	View various reports using different media devices

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DJ19MEC8015 IoT and Applications

On completion of the course, learner will be able to:	
DJ19MEC8015.1	Understanding of IoT value chain structure (device, data cloud), application areas and technologies involved
DJ19MEC8015.2	Understand IoT sensors and technological challenges faced by IoT devices, with a focus on wireless, energy, power, and sensing modules.
DJ19MEC8015.3	Market forecast for IoT devices with a focus on sensors.
DJ19MEC8015.4	Explore and learn about Internet of Things with the help of preparing projects designed for Raspberry Pi.

DJ19MEC8016 Process Equipment Design

On completion of the course, learner will be able to:	
DJ19MEC8016.1	Understand the basics of process equipment design
DJ19MEC8016.2	Design a reaction vessel to meet the given requirements
DJ19MEC8016.3	Design a storage tank as per industrial standards
DJ19MEC8016.4	Design a shell and tube heat exchanger for single phase heat transfer
DJ19MEC8016.5	Design vertical towers like distillation columns

DJ19MEC8017 Motor Sports Engineering

On completion of the course, learner will be able to:	
DJ19MEC8017.1	Define selection criteria and specifications of metallic and non-metallic materials.
DJ19MEC8017.2	Analyze modelling and simulation results with respect to structural responses behavior.
DJ19MEC8017.3	Distinguish the complex relationships between competition vehicle design aspects and competition vehicle performance.
DJ19MEC8017.4	Evaluate the matching of engine, transmission, and vehicle chassis for motorsport applications.
DJ19MEC8017.5	Understand application of aerodynamics in motorsports.
DJ19MEC8017.6	Design, evaluate and optimize data systems based on fundamental principles of electrical and digital information transfer.

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DJ19MEC8018 Advanced Quantitative Techniques

On completion of the course, learner will be able to:	
DJ19MEC8018.1	Explain significance of sensitivity analysis of LPP and perform sensitivity analysis on various parameters involved in LP model.
DJ19MEC8018.2	Recognize the limitations of simplex method in deriving integer solution to LPP and employ suitable algorithm to obtain integer solution.
DJ19MEC8018.3	Identify real-world problems as special cases of Linear Programming Problem and Solve the decision problem by choosing appropriate algorithm.
DJ19MEC8018.4	Analyse various decision-making situations, outline decision alternatives and select the best alternative.
DJ19MEC8018.5.6	Describe a real-world problem as a Non-Linear Programming Problem and Distinguish local, global extreme points and point of inflection

DJ19MEP804 Project – II

On completion of the course, learner will be able to:	
DJ19MEP804.1	Apply basic engineering fundamentals in the domain of practical applications.
DJ19MEP804.2	Identify, formulate and analyse the engineering problems based on literature review.
DJ19MEP804.3	Attempt a problem solution with systematic approach and ethics.
DJ19MEP804.4	Correlate the theoretical and experimental / simulations results and draw the proper inferences.
DJ19MEP804.5	Develop the habit of working in a team and communicate efficiently with engineering community and society.
DJ19MEP804.6	Recognize the need for lifelong learning activities to cope up with technological changes

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M. Tech. Semester I- Course Outcomes

Course: Computer Integrated Manufacturing Systems **Course Code: DJS22MPGC101**	
On completion of the course, learner will be able to:	
DJS22MPGC101.1	Understand the basic principles of CIM and its elements
DJS22MPGC101.2	Distinguish different types of inspection methods.
DJS22MPGC101.3	Emphasise the importance of group technology and cellular manufacturing systems
DJS22MPGC101.4	Design automated material handling and storage systems for a typical production system
DJS22MPGC101.5	Understand the importance of data communications in CIM environment

Course: Quality Engineering **Course Code: DJS22MPGC102**	
On completion of the course, learner will be able to:	
DJS22MPGC102.1	Demonstrate the understanding of modern quality concepts.
DJS22MPGC102.2	Demonstrate the understanding of statistical quality control charts.
DJS22MPGC102.3	Apply standard sampling plans.
DJS22MPGC102.4	Analyse modern management trends in quality improvement.
DJS22MPGC102.5	Apply concepts of TQM.

Course: New Product Design & Development **Course Code: DJS22MPGC111**	
On completion of the course, learner will be able to:	
DJS22MPGC111.1	Understand the generic product design & development process, tools and methodologies.
DJS22MPGC111.2	Get familiarised with product life cycle & product life cycle assessment
DJS22MPGC111.3	Get familiarised with various software solutions and choose appropriate design approaches.
DJS22MPGC111.4	Understand product costing approach and economic feasibility of the product.
DJS22MPGC111.5	Get conversant with I.P rights & patenting procedure.

Course: Smart Materials **Course Code: DJS22MPGC112**	
On completion of the course, learner will be able to:	
DJS22MPGC112.1	Understand working of smart materials and their application as actuator and sensor.
DJS22MPGC112.2	Select an appropriate smart material for a given application.
DJS22MPGC112.3	Identify applicability of smart materials for new prospective smart structures.

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Course: World Class Manufacturing **Course Code: DJS22MPGC113**	
On completion of the course, learner will be able to:	
DJS22MPGC113.1	Understand the relevance and basics of World Class Manufacturing.
DJS22MPGC113.2	Design and develop a roadmap for world class manufacturing
DJS22MPGC113.3	Meet the challenges that the Indian manufacturer's faces, as it evolves from a domestic to a world class global manufacturer status

Course: Manufacturing Planning and Control **Course Code: DJS22MPGC121**	
On completion of the course, learner will be able to:	
DJS22MPGC121.1	Analyse various aspects of good manufacturing planning and control framework.
DJS22MPGC121.2	Design demand management scheme using demand forecasting methods and prepare aggregate plan.
DJS22MPGC121.3	Develop the plan for scheduling and sequencing of manufacturing operations
DJS22MPGC121.4	Create a logical approach to Line balancing in various production systems

Course: Reliability Engineering **Course Code: DJS22MPGC122**	
On completion of the course, learner will be able to:	
DJS22MPGC122.1	Understand and apply the theory and laws of Probability to solve engineering problems.
DJS22MPGC122.2	Apply various reliability concepts to calculate different reliability parameters.
DJS22MPGC122.3	Estimate the system reliability of simple and complex systems and improve the reliability of system with various techniques
DJS22MPGC122.4	Apply the Reliability concepts in Maintenance of device/equipment.
DJS22MPGC122.5	Apply a Failure Mode Effect and Criticality method to carry out Reliability analysis.

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Course: Micro and Nano manufacturing **Course Code: DJS22MPGC123**	
On completion of the course, learner will be able to:	
DJS22MPGC123.1	Get an awareness of different techniques used in micro and nano manufacturing.
DJS22MPGC123.2	Get in-depth idea of the conventional techniques used in micro manufacturing.
DJS22MPGC123.3	Become aware about non-conventional micro-nano manufacturing and finishing approaches.
DJS22MPGC123.4	Get awareness on micro and nano finishing processes.
DJS22MPGC123.5	Understand micro and nanofabrication techniques and other processing routes in micro and nano manufacturing.
DJS22MPGC123.6	Know about different techniques used in micro joining and the metrology tools in micro and nano manufacturing.

Course: Data Analytics	**Course Code: DJS22OPGC131**
On completion of the course, learner will be able to:	
DJS22OPGC131.1	Interpret data using descriptive statistics.
DJS22OPGC131.2	Demonstrate sampling distributions and estimate statistical parameters.
DJS22OPGC131.3	Develop hypothesis based on data and perform testing using various statistical techniques
DJS22OPGC131.4	Perform analysis of variance on data.
DJS22OPGC131.5	Examine relations between data

Course: Journey from Intellectual Property to Patenting	**Course Code: DJS22OPGC132**
On completion of the course, learner will be able to:	
DJS22OPGC132.1	Recognize the crucial role of IP for the purposes of product and technology development
DJS22OPGC132.2	Understand how and when to file a patent
DJS22OPGC132.3	Apply the knowledge to understand the entire ecosystem
DJS22OPGC132.4	Derive value from IP and leverage its value in new product and service development

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Course: Cyber Security and Laws	Course Code: DJS22OPGC133
On completion of the course, learner will be able to:	
DJS22OPGC133.1	Understand the distinct types of cybercrime and security issues E Business
DJS22OPGC133.2	Analyses distinct types of cyber threats and techniques for security management
DJS22OPGC133.3	Explore the legal requirements and standards for cyber security in various countries to regulate cyberspace
DJS22OPGC133.4	Impart the knowledge of Information Technology Act and legal framework of right to privacy, data security and data protection

Course: Agile Frameworks	Course Code: DJS22OPGC134
On completion of the course, learner will be able to:	
DJS22OPGC134.1	Summarize the concepts of agile practices and business objectives.
DJS22OPGC134.2	Gain knowledge on the phases of agile development framework.
DJS22OPGC134.3	Have an exposure on the scaling factors and models to be developed for agile projects.
DJS22OPGC134.4	Acquire knowledge on the agile performance measurement.
DJS22OPGC134.5	Develop the product based on agile factors with risk mitigation.
DJS22OPGC134.6	Describe the role of agile in enterprise management and incremental delivery.

Course: Design of Experiments	Course Code: DJS22OPGC135
On completion of the course, learner will be able to:	
DJS22OPGC135.1	Plan data collection, to turn data into information and to make decisions that lead to appropriate action
DJS22OPGC135.2	Apply the methods taught to real life situations.
DJS22OPGC135.3	Plan, analyze, and interpret the results of experiments

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Course: Operations Research	**Course Code: DJS22OPGC136**

On completion of the course, learner will be able to:

DJS22OPGC136.1	Convert a real-world problem in to a Linear Programming Problem and Interpret the solution obtained using Simplex method or other algorithms.
DJS22OPGC136.2	Understand reasons of formation of queues, Classify various queuing systems and Apply performance parameters defined for various queuing systems for decision making in real life situations.
DJS22OPGC136.3	Describe concept of simulation and Apply Monte Carlo Simulation technique to systems such as inventory, queuing and Develop solutions for them.
DJS22OPGC136.4	Solve the Game and explore the optimal strategies.
DJS22OPGC136.5	Identify the decision situations which vary with time and Analyze them using principle of dynamic programming to real life situations

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M. Tech. Semester II- Course Outcomes

Course: Industrial Automation	
Course Code: DJS22MPGC201	
On completion of the course, learner will be able to:	
DJS22MPGC201.1	Students shall be able to understand the working of automation systems and shall acquire the insight to build the automation systems
DJS22MPGC201.2	Illustrates the use of PLC in Automation

Course: Advanced Quantitative Techniques	
Course Code: DJS22MPGC202	
On completion of the course, learner will be able to:	
DJS22MPGC202.1	Explain significance of sensitivity analysis of LPP and Perform sensitivity analysis on various parameters involved in LP model.
DJS22MPGC202.2	Recognize the limitations of simplex method in deriving integer solution to LPP and Employ suitable algorithm to obtain integer solution
DJS22MPGC202.3	Analyse various decision-making situations, Outline decision alternatives and Select the best alternative
DJS22MPGC202.4	Describe a real-world problem as a Non-Linear Programming Problem and Distinguish local, global extreme points and point of inflection.
DJS22MPGC202.5	Explain significance of Markov Analysis to predict the state of a system

Course: Manufacturing Simulation Lab	
Course Code: DJS22MPGL203	
On completion of the course, learner will be able to:	
DJS22MPGL203.1	Identify Understand, simulate and optimize the processes under consideration
DJS22MPGL203.2	Simulate and work for cost reduction in any given process

Course: Strategic Manufacturing for Sustainability	
Course Code: DJS22MPGC211	
On completion of the course, learner will be able to:	
DJS22MPGC211.1	Identify and deal with economic, social and technological concerns in sustainable manufacturing front
DJS22MPGC211.2	Pursue eco-friendly approaches in managing various forms of waste including hazardous waste
DJS22MPGC211.3	Apply environment friendly options in design and manufacturing operations to bring down carbon foot prints
DJS22MPGC211.4	Get adequate exposure to energy efficient initiatives and energy management
DJS22MPGC211.5	Get exposure to environmental standards/legislations and develop capability in assessing environment impact

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Course: Additive Manufacturing and Rapid Prototyping **Course Code: DJS22MPGC212**	
On completion of the course, learner will be able to:	
DJS22MPGC212.1	Understand importance of Rapid Prototyping in product development
DJS22MPGC212.2	Apply basic knowledge of additive manufacturing to decide type of additive manufacturing process and material according components design requirement
DJS22MPGC212.3	To calculate and justify the cost of a typical additive manufacturing operation including labour costs, overhead costs, and consumable costs
DJS22MPGC212.4	Evaluate the different post processing techniques used on AM parts, including those required for removal of support structures, improvement of surface characteristics and structural integrity
DJS22MPGC212.5	Conduct research work and research writing in the field of additive manufacturing
Course: Manufacturing Systems Design **Course Code: DJS22MPGC213**	
On completion of the course, learner will be able to:	
DJS22MPGC213.1	Understand and appreciate the capabilities and limitations of various manufacturing systems
DJS22MPGC213.2	Identify and select appropriate manufacturing systems for specific applications.
DJS22MPGC213.3	Design and implement appropriate model of manufacturing systems in specific contexts
DJS22MPGC213.4	Cope up with the ongoing demands of the industry, specifically on the manufacturing front
Course: Logistics and Supply Chain Management **Course Code: DJS22MPGC221**	
On completion of the course, learner will be able to:	
DJS22MPGC221.1	Demonstrate the functional strategy map of supply chain management.
DJS22MPGC221.2	Analyze the determinants of Supply Chain and Transportation networks design.
DJS22MPGC221.3	Demonstrate the need of coordination and sourcing decisions in supply chain
DJS22MPGC221.4	Understand pricing, revenue management and role of IT in supply chain
DJS22MPGC221.5	Understand various sustainability aspects of a supply chain

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Course: Machine Health Monitoring Management Course Code: DJS22MPGC222	
On completion of the course, learner will be able to:	
DJS22MPGC222.1	Understand basics of machine health monitoring management
DJS22MPGC222.2	Apply basic Instrumentation and signal processing technique in machine health monitoring management
DJS22MPGC222.3	Recognize pattern in problems involved in machine health monitoring
DJS22MPGC222.4	Gain knowledge about the application of artificial intelligence techniques in Condition monitoring.
DJS22MPGC222.5	Gain knowledge about the application of Machine learning techniques in Condition monitoring.

Course: Project management Course Code: DJS22OPGC234	
On completion of the course, learner will be able to:	
DJS22OPGC234.1	Assess a project by establishing a business case and accordingly prepare a project proposal.
DJS22OPGC234.2	Develop a project plan.
DJS22OPGC234.3	Identify task inter-dependencies, construct and analyze a network diagram
DJS22OPGC234.4	Monitor and control the performance of the project.
DJS22OPGC234.5	Demonstrate Team work and team spirit and resolve conflicts

Course: Machine Learning Course Code: DJS22OPGC231	
On completion of the course, learner will be able to:	
DJS22OPGC231.1	Analyze the applications, which can use Machine Learning Techniques.
DJS22OPGC231.2	Understand and Apply regression, classification and clustering methods to the database
DJS22OPGC231.3	Interpret the difference between supervised and unsupervised learning methods
DJS22OPGC231.4	Understand the working of Reinforcement learning.
DJS22OPGC231.5	Understand basic concepts of Genetic Algorithms

Course: Renewable Energy Course Code: DJS22OPGC232	
On completion of the course, learner will be able to:	
DJS22OPGC232.1	Identify sustainable energy solutions for sustainable development.
DJS22OPGC232.2	Analyze renewable energy resources availability and utilization.
DJS22OPGC232.3	Demonstrate competency in renewable systems analysis independently

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Course: Digital Marketing **Course Code: DJS22OPGC233**	
On completion of the course, learner will be able to:	
DJS22OPGC233.1	Apply B2B and B2C contexts to plan content marketing
DJS22OPGC233.2	Develop and measure impact of content that works well for your target audience.
DJS22OPGC233.3	Manage social media presence, and create effective content for each platform.
DJS22OPGC233.4	Optimize search engine presence through on-site and off-site activities, develop target keyword list, optimize website UX and design, and execute a link building campaign
DJS22OPGC233.5	Create, execute, and optimize an effective Ad campaign. Display and set up advertising works
DJS22OPGC233.6	Create an email marketing strategy, create and execute email campaigns, and measure the results

Course: Smart Industries **Course Code: DJS22MPGC223**	
On completion of the course, learner will be able to:	
DJS22MPGC223.1	Understand the basic principles behind smart industry
DJS22MPGC223.2	Identify smart industry key levers and drivers
DJS22MPGC223.3	Understand the supporting technologies for Smart factories
DJS22MPGC223.4	Learn from leading industries and develop smart factory roadmaps

Course: Product Life Cycle Management **Course Code: DJS22OPGC236**	
On completion of the course, learner will be able to:	
DJS22OPGC236.1	Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation
DJS22OPGC236.2	Illustrate various approaches and techniques for designing and developing products
DJS22OPGC236.3	Understand the need for Product Life Cycle Assessment (LCA) and Life Cycle Cost Analysis
DJS22OPGC236.4	Demonstrate the various PLM Applications, Modules, and virtual product development tools for components, machining and manufacturing plant.
DJS22OPGC236.5	Appreciate the significant effect of effective marketing strategies and integration of PLM with other business modules

Course: Research Methodology **Course Code: DJS22OPGC235**	
On completion of the course, learner will be able to:	
DJS22OPGC235.1	Understand research concepts, types, significance and importance of research profile
DJS22OPGC235.2	Prepare a preliminary research design for projects in their subject matter areas
DJS22OPGC235.3	Accurately collect, analyze and report data.
DJS22OPGC235.4	Review and analyze research findings.
DJS22OPGC235.5	Prepare the research report

Department of Computer Science and Engineering (Data Science)
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S.Y. B. Tech. Semester III: Course Outcomes

DJS22DSC301& DJS22DST301 - Mathematics for Intelligent Systems and Mathematics for Intelligent Systems – Tutorial

After completing the course, Student will be able to:	
DJS22DSC301.1	Analyze probability of random variable and probability distributions
DJS22DSC301.2	Demonstrate knowledge of linear algebra
DJS22DSC301.3	Apply concepts of matrix theory
DJS22DSC301.4	Demonstrate concepts of calculus
DJS22DSC301.5	Analyze different optimization techniques

DJS22DSC302 & DJS22DSL302 - Data Structures and Algorithms and Data Structures and Algorithms Laboratory

After completing the course, Student will be able to:	
DJS22DSC302.1	Understand the concept of time and space complexity for algorithms.
DJS22DSC302.2	Assimilate the concept of various linear and non-linear data structures.
DJS22DSC302. 3	Solve the problem using appropriate data structure.
DJS22DSC302. 4	Implement appropriate searching and sorting techniques for a given problem.

DJ22DSC303 & DJ22DSL303 - System Fundamentals and System Fundamentals Laboratory

After completing the course, Student will be able to:	
DJ22DSC303 .1	Describe the fundamental organization of a computer system.
DJ22DSC303 .2	Apply appropriate memory mapping, process scheduling and disk scheduling methods.
DJ22DSC303 .3	Identify the need of concurrency and apply appropriate method to solve the concurrency or deadlock problem.
DJ22DSC303 .4	Differentiate between various processor architecture.

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DJS22DSC304 & DJS22DSL304 - Database Management Systems and Database Management Systems Laboratory

After completing the course, Student will be able to:	
DJS22DSC304 .1	Design an optimized database.
DJS22DSC304 .2	Construct SQL queries to perform operations on the database.
DJS22DSC304 .3	Demonstrate appropriate transaction management and recovery techniques for a given problem.
DJS22DSC304 .4	Apply indexing mechanisms for efficient retrieval of information from database

DJS22DSL305 - Programming with Python Laboratory

After completing the course, Student will be able to:	
DJS22DSL305.1	Demonstrate basic data types, data structures and the concepts of Object-oriented programming in python.
DJS22DSL305.2	Implement file handling and text processing concepts in python.
DJS22DSL305.3	Develop an application using Tkinter, database connectivity and client-server communication using python.
DJS22DSL305.4	Apply various advanced modules of Python for data analysis.

DJS22DSL306 - Web Engineering Laboratory

After completing the course, Student will be able to:	
DJS22DSL306 .1	Design a website as per the requirements.
DJS22DSL306 .2	Apply the concepts of cloud computing to improve the efficiency of web development.
DJS22DSL306 .3	Evaluate the requirement of the problem and select appropriate method of web development

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DJS22ILLA1 - Innovative Product Development-I

After completing the course, Student will be able to:	
DJS22ILLA1.1	Identify the requirement for a product based on societal/research needs.
DJS22ILLA1.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJS22ILLA1.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJS22ILLA1.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product.
DJS22ILLA1.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJS22ILLA1.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJS22ILLA1.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication.

DJS22A2 - Constitution of India

After completing the course, Student will be able to:	
DJS22ILLA1.1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
DJS22ILLA1.2	Understand state and central policies, fundamental duties.
DJS22ILLA1.3	Understand Electoral Process, special provisions.
DJS22ILLA1.4	Understand powers and functions of Municipalities, Panchayat's and Co-operative Societies,
DJS22ILLA1.5	Understand Engineering ethics and responsibilities of Engineers
DJS22ILLA1.6	Understand Engineering Integrity & Reliability

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S.Y. B. Tech. Semester IV-Course Outcome

DJS22DSC401 & DJS22DSL401 - Statistics for Data Science and Statistics for Data Science Laboratory

After completing the course, Student will be able to:	
DJS22DSC401.1	Interpret data using descriptive statistics
DJS22DSC401.2	Demonstrate sampling distributions and estimate statistical parameters
DJS22DSC401.3	Develop hypothesis based on data and perform testing using various statistical techniques.
DJS22DSC401.4	Perform analysis of variance on data
DJS22DSC401.5	Examine relations between data

DJS22DSC402 & DJS22DSL402 - Machine Learning –I and Machine Learning - I Laboratory

After completing the course, Student will be able to:	
DJS22DSC402 .1	Classify given problems into classification, clustering and regression problems
DJS22DSC402 .2	Apply machine learning techniques for a given problem
DJS22DSC402 .3	Examine the dataset, choose appropriate algorithm and evaluate the results.
DJS22DSC402 .4	Design applications using machine learning algorithms

DJS22DSC403 & DJS22DSL403 - Design and Analysis of Algorithms and Design and Analysis of Algorithms Laboratory

After completing the course, Student will be able to:	
DJS22DSC403.1	Analyze the performance of algorithms using asymptotic analysis.
DJS22DSC403.2	Solve the problem using appropriate algorithmic design techniques.
DJS22DSC403.3	Able to prove that certain problems are NP-Complete.

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DJS22DSC404 & DJS22DSL404 - Computer Communication and Networks and Computer Communication and Networks Laboratory

After completing the course, Student will be able to:	
DJS22DSC404.1	Develop a strong foundational understanding of computer networks, including the principles and concepts of network communication, protocols, and architectures.
DJS22DSC404.2	Acquire knowledge and practical experience in the design and implementation of IoT architectures.
DJS22DSC404.3	Explore the diverse applications of networking in the modern world, with a specific focus on interconnecting smart objects using IP.

DJS22DSL405 - Data Engineering and Visualization Laboratory

After completing the course, Student will be able to:	
DJS22DSL405.1	Apply visualization techniques to understand Data.
DJS22DSL405.2	Apply ETL and perform OLAP operation.
DJS22DSL405.3	Apply appropriate techniques to enhance data quality
DJS22DSL405.4	Perform feature engineering to get data ready for modelling.

DJS22IHC1 & DJS22IHT1- Universal Human Values and Universal Human Values Tutorial

After completing the course, Student will be able to:	
DJS22IHC1.1	Become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have better critical ability
DJS22IHC1.2	Become sensitive to their commitment towards what they have understood (human values, human relationships, and human society).
DJS22IHC1.3	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

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DJS22ILLA2 - **Innovative Product Development-II**

After completing the course, Student will be able to:	
DJS22ILLA2.1	Identify the requirement for a product based on societal/research needs.
DJS22ILLA2.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJS22ILLA2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJS22ILLA2.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product.
DJS22ILLA2.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJS22ILLA2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJS22ILLA2.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication.

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T.Y. B. Tech. Semester V-Course Outcome

DJ19DSC501 & DJ19DSL501- Machine Learning -II (Deep Learning) & Machine Learning -II Laboratory

After completing the course, Student will be able to:	
DJ19DSC501.1	Analyze different neural network architectures and their learning algorithms.
DJ19DSC501.2	Implement deep network training and design concepts.
DJ19DSC501.3	Build solution using appropriate neural network models.
DJ19DSC501.4	Illustrate performance of deep learning models using Explainable AI.

DJ19DSC502 & DJ19DSL502 - Artificial Intelligence & Artificial Intelligence Laboratory

After completing the course, Student will be able to:	
DJ19DSC502.1	Classify given problem and identify the need of intelligent agent.
DJ19DSC502.2	Apply appropriate search-based method for a given problem.
DJ19DSC502.3	Analyze various AI approaches to knowledge– intensive problem solving, reasoning and planning.
DJ19DSC502.4	Design an expert system for a given AI problem.

DJ19DSC503 & DJ19DSL503- Information Security & Information Security Laboratory

After completing the course, Student will be able to:	
DJ19DSC503.1	Illustrate fundamentals of network design and cryptography.
DJ19DSC503.2	Apply appropriate algorithms to ensure Information security during data transmission.
DJ19DSC503.3	Identify various security vulnerabilities in an existing system.

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DJ19DSL504 - JAVA and Scala Laboratory

After completing the course, Student will be able to:	
DJ19DSL504.1	Implement Java and Scala program to provide solution for a given Problem.
DJ19DSL504.2	Select suitable programming language depending on the scalability of an application.

DJ19DSC5011& DJ19DSL5011 - Distributed Computing & Distributed Computing Laboratory

After completing the course, Student will be able to:	
DJ19DSC5011.1	Demonstrate Interprocess Communication and Synchronization in a Distributed System.
DJ19DSC5011.2	Apply appropriate Resource, Process management, File and Memory technique in a given Distributed Environment for efficient processing.
DJ19DSC5011.3	Apply suitable methods to improve data availability in a system.

DJ19DSC5012 & DJ19DSL5012 - Time Series Analysis & Time Series Analysis Laboratory

After completing the course, Student will be able to:	
DJ19DSC5012.1	Interpret a correlogram and a sample spectrum.
DJ19DSC5012.2	Apply appropriate model for a time series dataset.
DJ19DSC5012.3	Compute forecasts for a variety of linear and non-linear methods and models.

DJ19DSC5013 & DJ19DSL5013 - Digital System Design & Digital System Design Laboratory

After completing the course, Student will be able to:	
DJ19DSC5013.1	Explain different digital codes and their conversions.
DJ19DSC50132	Minimize logic expressions using various reduction techniques
DJ19DSC5013.3	Analyze and design combinational logic circuits.
DJ19DSC5013.4	Design flip-flops using logic gates and use them to realize different sequential circuits
DJ19DSC5013.5	Classify different programmable logic devices.

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DJ19DSC5014 & DJ19DSL5014 - Probabilistic Graph Models & Probabilistic Graph Models

After completing the course, Student will be able to:	
DJ19DSC5014.1	Explain the basic fundamentals of probabilistic graph theory.
DJ19DSC5014.2	Illustrate various principles of graph theory and algorithms.
DJ19DSC5014.3	Integrate core theoretical knowledge of graph theory to solve problems.

DECL505 - Environmental Studies

After completing the course, Student will be able to:	
DECL505.1	Understand how human activities affect environment .
DECL505.2	Understand the various technology options that can make a difference

DJ19CEL506 - Innovative Product Development - III

After completing the course, Student will be able to:	
DJ19CEL506.1	Identify the requirement for a product based on societal/research needs.
DJ19CEL506.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJ19CEL506.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19CEL506.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product.
DJ19CEL506.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ19CEL506.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJ19CEL506.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication.

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T.Y. B. Tech. Semester VI-Course Outcome

DJ19DSC601 & DJ19DSL601- Machine Learning -III (Reinforcement Learning) & Machine Learning -III Laboratory

After completing the course, Student will be able to:	
DJ19DSC601.1	Explain basic and advanced Reinforcement Learning techniques.
DJ19DSC601.2	Identify suitable learning tasks to which Reinforcement learning and Deep Reinforcement Learning techniques can be applied.
DJ19DSC601.3	Apply appropriate Reinforcement Learning method to solve a given problem.

DJ19DSC602 & DJ19DSL602 - Computational Linguistics & Computational Linguistics Laboratory

After completing the course, Student will be able to:	
DJ19DSC602.1	Understand the pre-processing required for linguistic data types.
DJ19DSC602.2	Apply appropriate pre-processing technique on linguistic data.
DJ19DSC602.3	Relate the pre-processing techniques for linguistic data to real world problems
DJ19DSC602.4	Develop applications based on natural language processing.

DJ19DSC603 & DJ19DSL603- Image Processing and Computer Vision - I & Image Processing and Computer Vision – I Laboratory

After completing the course, Student will be able to:	
DJ19DSC603.1	Identify the need of different image and video pre-processing.
DJ19DSC603.2	Apply different image and video corrections.
DJ19DSC603.3	Compare different image and video processing methods.

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DJ19DSL604 - Big Data Engineering Laboratory

After completing the course, Student will be able to:	
DJ19DSL604.1	Relate to the need of different types of data preprocessing tools/methods.
DJ19DSL604.2	Use appropriate tool/method for a specific Data Engineering task.

DJ19DSC6011& DJ19DSL6011 - Cloud Computing & Cloud Computing Laboratory

After completing the course, Student will be able to:	
DJ19DSC6011.1	Differentiate between different visualization methods and cloud computing technologies.
DJ19DSC6011.2	Evaluate the need of cloud migration and available infrastructure for cloud deployment.
DJ19DSC6011.3	Deploy secure cloud-based applications.
DJ19DSC6011.4	Evaluate the risk in various cloud deployments.

DJ19DSC6012 & DJ19DSL6012 - Recommender systems & Recommender systems Laboratory

After completing the course, Student will be able to:	
DJ19DSC6012.1	Compare different types of Recommender Systems.
DJ19DSC6012.2	Understand various issues related to recommender system development
DJ19DSC6012.3	Design a recommender system for a given problem.
DJ19DSC6012.4	Relate data collected from a recommender system to understand user preferences and/or behavior.

DJ19DSC6013 & DJ19DSL6013 - Embedded Systems & RTOS & Embedded Systems & RTOS Laboratory

After completing the course, Student will be able to:	
DJ19DSC6013 .1	Identify and describe various characteristic features and applications of embedded systems.
DJ19DSC6013 .2	Analyze and identify hardware for embedded system implementations.
DJ19DSC6013 .3	Analyze and identify various software issues involved in embedded systems for real timerequirements.
DJ19DSC6013 .4	Analyze and explain the design life-cycle for embedded system implementation.

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DJ19DSC6014 & DJ19DSL6014 - Cognitive Neuroscience & Cognitive Neuroscience Laboratory

After completing the course, Student will be able to:	
DJ19DSC6014.1	Analyse the methods of knowledge representation in cognitive processing.
DJ19DSC6014.2	Design cognitive architectures.
DJ19DSC6014.3	Understand the connection between brain and cognition.
DJ19DSC6014.4	Apply neural network models to cognition
DJ19DSC6014.5	Apply reasoning & decision making to design dynamic systems.

DJ19ILL2 - Innovative Product Development-IV

After completing the course, Student will be able to:	
DJ19ILL2.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL2.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJ19ILL2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL2.4	Draw proper inferences through theoretical/ experimental/simulations and analyzed the impact of the proposed method of design and development of the product.
DJ19ILL2.5	Develop interpersonal skills, while working as a member of the team or as thel eader.
DJ19ILL2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJ19ILL2.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication.

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B.Tech. Semester VII: Course Outcomes

DJ19DSC701 & DJ19DSL701 - Machine Learning - IV and Machine Learning - IV Laboratory

After completing the course, Student will be able to:	
DJ19DSC701.1	Evaluate the need of MapReduce framework.
DJ19DSC701.2	Apply appropriate method to handle big data.
DJ19DSC701.3	Apply suitable analysis method to draw conclusions from given big data.

DJ19DSC702 & DJ19DSL702 - Image Processing and Computer Vision – II and
Image Processing and Computer Vision – II Laboratory

After completing the course, Student will be able to:	
DJ19DSC702.1	Understand various data capturing methods.
DJ19DSC702.2	Apply appropriate object detection and object segmentation methods.
DJ19DSC702.3	Apply suitable method to analyze complex vision data.
DJ19DSC702.4	Develop suitable vision model for prediction.

DJ19DSL703 - Applied Data Science Laboratory

After completing the course, Student will be able to:	
DJ19DSL703.1	Relate to production systems available in the industry.
DJ19DSL703.2	Debug various problems occurred in a data science production system.

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DJ19DSC7011 & DJ19DSL7011 - Parallel Computing and Parallel Computing Laboratory

After completing the course, Student will be able to:	
DJ19DSC7011.1	Understand different structures of Parallel Computers.
DJ19DSC7011.2	Apply parallel algorithms in problem solving.

DJ19DSC7012 & DJ19DSL7012 - Advanced Computational Linguistics and

Advanced Computational Linguistics Laboratory

After completing the course, Student will be able to:	
DJ19DSC7012.1	Apply classification techniques on linguistic data.
DJ19DSC7012.2	Apply machine Learning and deep learning techniques to build language model.
DJ19DSC7012.3	Develop applications based on natural language processing.

DJ19DSC7013 & DJ19DSL7013 - IoT Network Enterprise and IoT Network Enterprise Laboratory

After completing the course, Student will be able to:	
DJ19DSC7013.1	Outline application & link layer services for wired and wireless applications.
DJ19DSC7013.2	Design & optimize – sensors, power modules and actuation for constrained environment applications.
DJ19DSC7013.3	Comprehend and evaluate the mechanism needed for network security of application environment.
DJ19DSC7013.4	Demonstrate the use of SaaS, PaaS and IaaS services.

DJ19DSC7014 & DJ19DSL7014 - Adversarial Machine Learning and

Adversarial Machine Learning Laboratory

After completing the course, Student will be able to:	
DJ19DSC7014.1	Outline the different categories of adversarial attacks and defenses against conventional machine learning models and deep learning models.
DJ19DSC7014.2	Identify the unique characteristics of adversarial machine learning attacks in the cybersecurity domain.
DJ19DSC7014.3	Understand the basics of adversarial privacy attacks and privacy-preserving defense methods.

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DJ19ILO7011 - Product Life Cycle Management

After completing the course, Student will be able to:	
DJ19ILO7011.1	Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation.
DJ19ILO7011.2	Illustrate various approaches and techniques for designing and developing products.
DJ19ILO7011.3	Apply product engineering guidelines / thumb rules in designing products for moulding, machining, sheet metal working etc.
DJ19ILO7011.4	Acquire knowledge in applying virtual product development tools for components, machining and manufacturing plant.

DJ19ILO7012 - Management Information System

After completing the course, Student will be able to:	
DJ19ILO7012 .1	Explain how information systems Transform Business.
DJ19ILO7012 .2	Identify the impact information systems have on an organization.
DJ19ILO7012 .3	Describe IT infrastructure and its components and its current trends.
DJ19ILO7012 .4	Understand the principal tools and technologies for accessing information from databases to improve business performance and decision making.
DJ19ILO7012 .5	Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses.

DJ19ILO7013 - Operations Research

After completing the course, Student will be able to:	
DJ19ILO7013.1	Convert a real-world problem in to a Linear Programming Problem and analyse the solution obtained using Simplex method or other algorithms.
DJ19ILO7013.2	Identify real-world problems as Transportation Problem and Assignment Problem and Solve the decision problem by choosing appropriate algorithm.
DJ19ILO7013.3	Identify the decision situations which vary with time and analyse them using principle of dynamic programming to real life situations.
DJ19ILO7013.4	Explain reasons of formation of queues, classify various queuing systems and apply parameters defined for various queuing systems for decision making in real life situations.

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DJ19ILO7013.5	Understand the concept of decision making in situation of competition and recommend strategies in case of two-person zero sum games.
DJ19ILO7013.6	Describe concept of simulation and apply Monte Carlo Simulation technique to systems such as inventory, queuing and recommend solutions for them
DJ19ILO7013.7	Understand need for right replacement policy and determine optimal replacement age.

DJ19ILO7014 - Cyber Security and Laws

After completing the course, Student will be able to:	
DJ19ILO7014.1	Understand the different types of cybercrime and security issues E Business.
DJ19ILO7014.2	Analyse different types of cyber threats and techniques for security management.
DJ19ILO7014.3	Describe IT infra Explore the legal requirements and standards for cyber security in various countries to regulate cyberspace.
DJ19ILO7014.4	Impart the knowledge of Information Technology Act and legal framework of right to privacy, data security and data protection.
DJ19ILO7014.5	Identify the types of systems used for enterprise-wide knowledge management and how they provide value for businesses.

DJ19ILO7015 - Personal Finance Management

After completing the course, Student will be able to:	
DJ19ILO7015.1	Use a framework for financial planning to understand the overall role finances play in his/her personal life.
DJ19ILO7015.2	Compute income from salaries, house property, business/profession, capital gains and income from other sources.
DJ19ILO7015.3	Compute the amount of CGST, SGST and IGST payable after considering the eligible input tax credit.
DJ19ILO7015.4	Understand how Microfinance can help in financial inclusion.

DJ19ILO7016 - Energy Audit and Management

After completing the course, Student will be able to:	
DJ19ILO7016.1	To identify and describe present state of energy security and its importance.
DJ19ILO7016.2	To identify and describe the basic principles and methodologies adopted in energy audit of a utility.

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DJ19ILO7016.3	To describe the energy performance evaluation of some common electrical installations and identify the energy saving opportunities.
DJ19ILO7016.4	To describe the energy performance evaluation of some common thermal installations and identify the energy saving opportunities.
DJ19ILO7016.5	To analyze the data collected during performance evaluation and recommend energy saving measures.

DJ19ILO7017 - Disaster Management and Mitigation Measures

After completing the course, Student will be able to:	
DJ19ILO7017.1	Know natural as well as manmade disaster and their extent and possible effects on the economy.
DJ19ILO7017.2	Know the institutional framework and organization structure in India for disaster management and get acquainted with government policies, acts and various emergency laws.
DJ19ILO7017.3	Get to know the simple dos and don'ts in such extreme events and build skills to respond accordingly.
DJ19ILO7017.4	Understand the importance of disaster prevention and various mitigation measure with the exposure to disasters hotspots across the globe

DJ19ILO7018 - Science of Well-being

After completing the course, Student will be able to:	
DJ19ILO7018.1	Describe concepts of holistic health and well-being, differentiate between its true meaning and misconceptions and understand the benefits of well-being.
DJ19ILO7018.2	Recognize meaning of happiness, practice gratitude and self-compassion and analyze incidents from one's own life
DJ19ILO7018.3	Understand the causes and effects of stress, identify reasons for stress in one's own surrounding and self.
DJ19ILO7018.4	Recognize the importance of physical health and fitness, assess their life style and come up with limitations or effectiveness.
DJ19ILO7018.5	Inspect one's own coping mechanism, assess its effectiveness, develop and strategize for betterment and execute it.

DJ19ILO7019 - Research Methodology

After completing the course, Student will be able to:	
DJ19ILO7019.1	Prepare a preliminary research design for projects in their subject matter areas.
DJ19ILO7019.2	Accurately collect, analyze and report data.
DJ19ILO7019.3	Present complex data or situations clearly

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DJ19ILO7019.4	Review and analyze research findings
DJ19ILO7019.5	Write report about findings of research carried out

DJ19ILO7020 - Public Systems and Policies

After completing the course, Student will be able to:	
DJ19ILO7020.1	Understand the importance of public systems in a fast-changing environment in the global context.
DJ19ILO7020.2	Analyze the transformations in public systems with emphasis on current initiatives and emerging challenges in the field.
DJ19ILO7020.3	Explain public policy and its operations with special focus on policy relating to Government finance
DJ19ILO7020.4	Make policies and know about the happenings in the world, in the nation and those in their locality.
DJ19ILO7020.5	Analyze and evaluate the impact of the public policy on firms and economy at large and work under various fields as policymakers.

DJ19DSP704 - Project Stage - I

After completing the course, Student will be able to:	
DJ19DSP704.1	Discover potential research areas in the field of IT.
DJ19DSP704.2	Survey several available literatures in the related field of study.
DJ19DSP704.3	Compare the several existing solutions for research challenges.
DJ19DSP704.4	Design the solution for the research plan.
DJ19DSP704.5	Summarize the findings of the study conducted.
DJ19DSP704.6	Work effectively as a member of the team.

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DJ19DSC801 & DJ19DST801 - Data Ethics and Data Ethics Tutorial

After completing the course, Student will be able to:	
DJ19DSC801.1	Describe the basic concepts related to Data Ethics and data driven business model.
DJ19DSC801.2	Explain the concept of Bias and Privacy in relation to Data Ethics.
DJ19DSC801.3	Discuss various digital trust and data governance in different applications.

DJ19DSC802 & DJ19DSL802 - High Performance Computing and
High Performance Computing Laboratory

After completing the course, Student will be able to:	
DJ19DSC802.1	Develop a deep understanding of the architecture and capabilities of GPUs, and they will be able to explain the relevance of GPUs in data science.
DJ19DSC802.2	Optimize GPU-based applications and identify and address performance bottlenecks, make efficient use of GPU memory, and apply parallel programming patterns to solve data science problems.
DJ19DSC802.3	Implement GPU-accelerated solutions for data processing and machine learning tasks, ultimately improving the speed and efficiency of data-driven decision-making processes.

DJ19DCL8011 & DJ19DSL8011 - Introduction to Quantum and
Introduction to Quantum Computing Laboratory

After completing the course, Student will be able to:	
DJ19DCL8011.1	To identify and analyse Quantum Building Blocks.
DJ19DCL8011.2	Apply advanced quantum computation algorithms for a real-world problem statement.

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DJ19DCL8012 & DJ19DSL8012 - Geo-Spatial Data Science & Geo-Spatial Data Science Laboratory

After completing the course, Student will be able to:	
DJ19DCL8012.1	Apply tools and techniques used to analyze and visualize geospatial data.
DJ19DCL8012.2	Applying data science methods to solve real-world problems with geospatial data.
DJ19DCL8012.3	Analyze geospatial large data models and ethical issues.

DJ19DCL8013 & DJ19DSL8013 - Advanced Networking Technology & Advanced Networking Technology Laboratory

After completing the course, Student will be able to:	
DJ19DCL8013.1	Evaluate/ Design Small – Medium Scale Networks from access layer to backbone layer.
DJ19DCL8013.2	Design for Emerging areas such as Iot and IIoT.
DJ19DCL8013.3	Migrate designs to new technologies that are high speed-high security-high QoS Networks.

DJ19DCL8014 & DJ19DSL8014 - Social Network Analysis & Social Network Analysis Laboratory

After completing the course, Student will be able to:	
DJ19DCL8014.1	Analyze a social network using various visualization tools.
DJ19DCL8014.2	Illustrate large-scale network data and mechanisms used for network growth models.
DJ19DCL8014.3	Examine social networks analysis and prediction using case studies.
DJ19DCL8014.4	Apply appropriate anomaly detection and graph representation method on a network.

DJ19ILO8021 - Project Management

After completing the course, Student will be able to:	
DJ19ILO8021.1	Explain project management life cycle and the various project phases as well as the role of project manager.
DJ19ILO8021.2	Apply selection criteria and select an appropriate project from different options.

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DJ19ILO8021.3	Create a work breakdown structure for a project and develop a schedule based on it. Manage project risk strategically.
DJ19ILO8021.4	Use Earned value technique and determine & predict status of the project.
DJ19ILO8021.5	Capture lessons learned during project phases and document them for future reference.

DJ19ILO8022 - Entrepreneurship Development and Management

After completing the course, Student will be able to:	
DJ19ILO8022.1	Develop idea generation, creative and innovative skills.
DJ19ILO8022.2	Prepare a Business Plan
DJ19ILO8022.3	Compare different entrepreneur supporting institutions
DJ19ILO8022.4	Correlate suitable MSME scheme for an entrepreneur
DJ19ILO8022.5	Interpret financial and legal aspects of a business.

DJ19ILO8023 - Corporate Social Responsibility

After completing the course, Student will be able to:	
DJ19ILO8023.1	Understand the key characteristics of Corporate Social Responsibility (CSR) in the context of present-day management.
DJ19ILO8023.2	Apprise regarding business decision-making which is informed by ethical values and respect for people, communities and the environment.
DJ19ILO8023.3	Become aware of creating a strategic plan that enables an organization to reach out to its internal and external stakeholders with consistent messages.
DJ19ILO8023.4	Understand critical issues of Corporate Social Responsibility (CSR) in a cross-cultural setting.

DJ19ILO8024 - Human Resource Management

After completing the course, Student will be able to:	
DJ19ILO8024.1	Understand the concepts, aspects, techniques and practices of the human resource management
DJ19ILO8024.2	Understand the Human resource management (HRM) processes, functions, changes and challenges in today's emerging organizational perspective.
DJ19ILO8024.3	Gain knowledge about the latest developments and trends in HRM.
DJ19ILO8024.4	Apply the knowledge of behavioral skills learnt and integrate it with in inter personal and intergroup environment emerging as future stable engineers and managers.

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DJ19ILO8025 - Corporate Finance Management

After completing the course, Student will be able to:	
DJ19ILO8025.1	Understand Indian finance system.
DJ19ILO8025.2	Apply concepts of time value money and risk returns to product, services and business.
DJ19ILO8025.3	Understand corporate finance; evaluate and compare performance of multiple firms.
DJ19ILO8025.4	Take Investment, finance as well as dividend decisions.

DJ19ILO8026 - Logistics and Supply Chain Management

After completing the course, Student will be able to:	
DJ19ILO8026.1	Demonstrate the functional strategy map of supply chain management
DJ19ILO8026.2	Analyze the determinants of Supply Chain and Transportation networks design.
DJ19ILO8026.3	Demonstrate the need of coordination and sourcing decisions in supply chain.
DJ19ILO8026.4	Understand pricing, revenue management and role of IT in supply chain.
DJ19ILO8026.5	Understand various sustainability aspects of a supply chain.

DJ19ILO8027 - IPR and Patenting

After completing the course, Student will be able to:	
DJ19ILO8027.1	Recognize the crucial role of IP for the purposes of product and technology development.
DJ19ILO8027.2	Understand how and when to file a patent
DJ19ILO8027.3	Apply the knowledge to understand the entire ecosystem
DJ19ILO8027.4	Derive value from IP and leverage its value in new product and service development

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DJ19ILO8028 - Digital Marketing Management

After completing the course, Student will be able to:	
DJ19ILO8028.1	Understand the digital marketing framework & model and consumer behaviour.
DJ19ILO8028.2	Develop digital marketing strategy roadmap
DJ19ILO8028.3	Explain the terminology and concepts for developing web-specific media plans
DJ19ILO8028.4	Understand concepts related to digital campaign management and revenue generation models.
DJ19ILO8028.5	Get a perspective on global digital marketing technology/tools and future trends

DJ19ILO8029 - Environmental Management

After completing the course, Student will be able to:	
DJ19ILO8029.1	Understand and identify environmental issues relevant to India and global concerns.
DJ19ILO8029.2	Learn concepts of ecology
DJ19ILO8029.3	Familiarise environment related legislations
DJ19ILO8029.4	Understand Environmental Auditing Procedures.

DJ19ILO8030 - Labour and Corporate Law

After completing the course, Student will be able to:	
DJ19ILO8030.1	Illustrate the role of trade union in the industrial setup
DJ19ILO8030.2	Understand the important causes, impact of industrial disputes and settlement procedures.
DJ19ILO8030.3	To provide in-depth understanding of corporate social responsibility.
DJ19ILO8030.4	Apply concepts, principles and theories to understand simple business laws.
DJ19ILO8030.5	Analyse the principle of international business and strategies adopted by firms to expand globally.

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DJ19DSP803 - Project-II

After completing the course, Student will be able to:	
DJ19DSP803.1	Develop the proposed solution using appropriate techniques.
DJ19DSP803.2	Test the developed system for its correctness using appropriate techniques
DJ19DSP803.3	Work effectively as a member of the team.

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S.Y. B. Tech. Semester III Course Outcomes

DJS22AMC301 & DJS22AMT301 Engineering Mathematics-III

On completion of the course, learner will be able to:	
DJS22AMC301.1	Learn the basic notation of vector spaces and subspaces.
DJS22AMC301.2	Apply the concept of inner product spaces to the engineering problems.
DJS22AMC301.3	Apply the concept of vector spaces using linear transformations which is used in computer graphics and inner product spaces.
DJS22AMC301.4	Apply the concepts of eigenvalue and eigenvectors and diagonalization in linear systems.
DJS22AMC301.5	Apply the concept of Linear & Non-Linear Programming Problem to the engineering problems.

DJS22AMC302 & DJS22AML302 Data Structures & Data Structures Laboratory

On completion of the course, learner will be able to:	
DJS22AMC302.1	Understand the concept of time and space complexity for algorithms
DJS22AMC302.2	Assimilate the concept of various linear and non-linear data structures.
DJS22AMC302.3	Solve the problem using appropriate data structure.
DJS22AMC302.4	Implement appropriate searching and sorting technique for a given problem

DJS22AMC303 & DJS22AML303 Database Management Systems

On completion of the course, learner will be able to:	
DJS22AMC303.1	Design an optimized database.
DJS22AMC303.2	Construct SQL queries to perform operations on the database.
DJS22AMC303.3	Demonstrate appropriate transaction management and recovery techniques for a given problem.
DJS22AMC303.4	Apply indexing mechanisms for efficient retrieval of information from database.

DJS22AMC304 & DJS22AML304 Operating Systems

On completion of the course, learner will be able to:	
DJS22AMC304.1	Understand the role of Operating System in terms of process, memory, file and I/O management.
DJS22AMC304.2	Apply appropriate process scheduling, memory mapping and disk scheduling methods.
DJS22AMC304.3	Identify the need of concurrency and apply the appropriate method to solve the concurrency or deadlock problem.
DJS22AMC304.4	Apply and analyze different techniques of file and I/O management.

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DJS22AML305 Programming Laboratory – I (Python Programming)

On completion of the course, learner will be able to:	
DJS22AML305.1	Understand basic and object-oriented concepts, data structure implementation in python.
DJS22AML305.2	Apply file, directory handling and text processing concepts in python.
DJS22AML305.3	Apply database connectivity, client-server communication using python.
DJS22AML305.4	Develop python-based application (web/Desktop) using Django web framework/Tkinter

DJS22IHC1 & DJS22IHT1 Universal Human Values

On completion of the course, learner will be able to:	
DJS22IHC1.1	Become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have better critical ability
DJS22IHC1.2	Become sensitive to their commitment towards what they have understood (human values, human relationship, and human society).
DJS22IHC1.3	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

DJS22ILLA1 Innovative Product Development-I

On completion of the course, learner will be able to:	
DJS22ILLA1.1	Identify the requirement for a product based on societal/research needs.
DJS22ILLA1.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJS22ILLA1.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJS22ILLA1.4	Draw proper inferences through theoretical/ experimental/simulations and analyse the impact of the proposed method of design and development of the product.
DJS22ILLA1.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJS22ILLA1.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJS22ILLA1.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication

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S.Y. B. Tech. Semester IV Course Outcomes

DJS22AMC401 & DJS22AML401 Statistics for Engineers

On completion of the course, learner will be able to:	
DJS22AMC401.1	Apply the concepts of probability and distributions to some case studies.
DJS22AMC401.2	Interpret and predict the basic statistical model for given data using simple linear regression.
DJS22AMC401.3	Demonstrate sampling distributions and estimate statistical parameters.
DJS22AMC401.4	Develop hypothesis based on data and perform testing using various statistical techniques.
DJS22AMC401.5	Perform analysis of variance on data
DJS22AMC401.6	Apply the concept of Markov Process.

DJS22AMC402 & DJS22AML402 Artificial Intelligence

On completion of the course, learner will be able to:	
DJS22AMC402.1	Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
DJS22AMC402.2	Understanding about the basic concepts of Intelligent agent's ad representation of knowledge
DJS22AMC402.3	Demonstrate awareness and a fundamental understanding of various applications of AI techniques.
DJS22AMC402.4	Apply basic principles of AI in solutions that require problem solving, knowledge representation, and learning

DJS22AMC403 & DJS22AML403 Data Mining and Analytics

On completion of the course, learner will be able to:	
DJS22AMC403.1	Apply data preprocessing techniques to clean and prepare datasets for machine learning
DJS22AMC403.2	Conduct exploratory data analysis to understand data distributions, relationships, and outliers.
DJS22AMC403.3	Effectively use graphical representations to visualize data and communicate insights.
DJS22AMC403.4	Implement dimensionality reduction techniques to manage and analyze high-dimensional data.

DJS22AMC404 & DJS22AML404 Design and Analysis of Algorithms

On completion of the course, learner will be able to:	
DJS22AMC404.1	Analyze the performance of algorithms using asymptotic analysis.
DJS22AMC404.2	Solve the problem using appropriate algorithmic design techniques.
DJS22AMC404.3	Able to prove that certain problems are NP-Complete.

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DJS22AML405 Programming Laboratory-II (Web Development)

On completion of the course, learner will be able to:	
DJS22AML405.1	Implement interactive web page(s) using HTML5, CSS3 and Bootstrap.
DJS22AML405.2	Apply JavaScript to add functionality to web page and construct front end development using React JS
DJS22AML405.3	Construct back-end development using Django
DJS22AML405.4	Apply the knowledge of different libraries to establish connections with databases and perform CRUD operations.
DJS22AML405.5	Implement API endpoints, handle incoming requests, validate data, and generate suitable responses.

DJS22AML406 Design Thinking Laboratory

On completion of the course, learner will be able to:	
DJS22AML406.1	Develop an application using fundamentals of Design Thinking.
DJS22AML406.2	Acquire hands-on proficiency in applying design thinking methodologies, processes
DJS22AML406.3	Develop a proactive attitude towards addressing societal challenges using design thinking
DJS22AML406.4	Work efficiently as a team member.

DJS22A2 Constitution of India

On completion of the course, learner will be able to:	
DJS22A2.1	Have general knowledge and legal literacy and thereby take up competitive examinations.
DJS22A2.2	Understand state and central policies, fundamental duties.
DJS22A2.3	Understand Electoral Process, special provisions.
DJS22A2.4	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies.
DJS22A2.5	Understand Engineering ethics and responsibilities of Engineers.
DJS22A2.6	Understand Engineering Integrity & Reliability.

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T.Y. B. Tech. Semester V Course Outcomes

DJ19AMC501 & DJ19AML501 Digital Signal and Image Processing

On completion of the course, learner will be able to:	
DJ19AMC501.1	Classify signals and systems on the basis of their properties and analyze the implications in the context of practical signals and systems.
DJ19AMC501.2	Represent signals in the time and frequency domain using multiple representations and analyze LTI systems using convolution in the frequency domain.
DJ19AMC501.3	Implement image enhancement techniques in spatial and frequency domain
DJ19AMC501.4	Interpret and apply image segmentation and representation techniques for object recognition.

DJ19AMC502 & DJ19AMl502 Machine Learning-II (Deep Learning)

On completion of the course, learner will be able to:	
DJ19AMC502.1	Understand the fundamentals of deep learning
DJ19AMC502.2	Apply supervised deep learning algorithms
DJ19AMC502.3	Apply unsupervised deep learning algorithms
DJ19AMC502.4	Understand the fundamentals of adversarial networks

DJ19AMC503 & DJ19AMC503 Devops

On completion of the course, learner will be able to:	
DJ19AMC503.1	Apply software engineering principles for application development.
DJ19AMC503.2	Apply various principles, phases and activities of agile as well as scrum methodology
DJ19AMC503.3	Understand and implement Devops principles for CI/CD.
DJ19AMC503.4	Apply testing process for application development
DJ19AMC503.5	Apply Configuration Management Tools using Containerization

DJ19AML504 Programming Laboratory-III (Full Stack Development using Python)

On completion of the course, learner will be able to:	
DJ19AML504.1	Analyze and evaluate different approaches for building front-end web applications.
DJ19AML504.2	Utilize the Flask framework to build a web server that can handle HTTP requests
DJ19AML504.3	Apply the knowledge of different libraries to establish connections with databases and perform CRUD operations
DJ19AML504.4	Implement API endpoints, handle incoming requests, validate data, and generate suitable responses..

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DJ19AMEC5011 & DJ19AMEL5011 Cloud Computing

On completion of the course, learner will be able to:	
DJ19AMEC501.1	Understand the fundamental concepts and principles of cloud computing.
DJ19AMEC501.2	Use virtualization technologies and tools
DJ19AMEC501.3	Understand the concept of identity and access management in cloud computing.
DJ19AMEC501.4	Utilize big data processing frameworks such as Hadoop, Spark, and Flink to process and analyze large datasets.

DJ19AMEC5012 & DJ19AMEL5012 : Advanced Data Structures and Algorithm

On completion of the course, learner will be able to:	
DJ19AMEC5012.1	Analyze the chosen algorithm.
DJ19AMEC5012.2	Choose appropriate data structure and algorithm for given problem statement
DJ19AMEC5012.3	Apply best suitable algorithms for a specific task.
DJ19AMEC5012.4	Classify the algorithms based on the complexity
DJ19AMEC5012.5	Design the algorithm

DJ19AMEC5013 & DJ19AMEL5013: Recommendation Systems

On completion of the course, learner will be able to:	
DJ19AMEC5013.1	Compare different types of Recommender Systems.
DJ19AMEC5013.2	Understand various issues related to recommender system development.
DJ19AMEC5013.3	Design a recommender system for a given problem..
DJ19AMEC5013.4	Relate data collected from a recommender system to understand user preferences and/or behavior.

DJ19A5: Environmental Studies

On completion of the course, learner will be able to:	
DJ19A5.1	Understand how human activities affect environment
DJ19A5.2	Understand the various technology options that can make a difference

DJ19ILL1: Innovative Product Development-III

On completion of the course, learner will be able to:	
DJ19ILL1.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL1.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJ19ILL1.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.

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DJ19ILL1.4	Draw proper inferences through theoretical/ experimental/simulations and analyse the impact of the proposed method of design and development of the product.
DJ19ILL1.5	Develop interpersonal skills, while working as a member of theteam or as theleader.
DJ19ILL1.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJ19ILL1.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication

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T. Y. B. Tech. Semester VI Course Outcomes

DJ19AMC601 & DJ19AML601 Computer Vision

On completion of the course, learner will be able to:	
DJ19AMC601.1	Analyze and explain the core concepts of computer vision, principles of imaging geometry, radiometry, and digitization.
DJ19AMC601.2	Recognize key image features, implement techniques for modeling noise and feature extraction effectively.
DJ19AMC601.3	Apply clustering, classification, and dimensionality reduction methods in pattern recognition and understand the significance of classifiers and their practical applications in pattern recognition.
DJ19AMC601.4	Utilize motion analysis techniques to track moving objects in videos. Implement spatio-temporal analysis and dynamic stereo methods in motion analysis and action detection

DJ19AMC602 & DJ19AML602 Natural Language Processing

On completion of the course, learner will be able to:	
DJ19AMC602.1	Understand the Principles and Process of Natural Languages and real-world applications.
DJ19AMC602.2	Demonstrate understanding of state-of-the-art algorithms and techniques for text-based processing of natural language with respect to morphology.
DJ19AMC602.3	Perform POS tagging for a given natural language and select a suitable language modelling technique based on the structure of the language.
DJ19AMC602.4	Check the syntactic and semantic correctness of sentences using grammars and labelling.

DJ19AMC603 & DJ19AML603 Machine Learning Operations (ML Ops)

On completion of the course, learner will be able to:	
DJ19AMC603.1	Automate the deployment of ML models into the core software system or as a service component
DJ19AMC603.2	Deploy machine learning models in a production environment.
DJ19AMC603.3	Implement model monitoring and performance evaluation.
DJ19AMC603.4	Manage and scale machine learning infrastructure.

DJ19AML604 Design Thinking Laboratory

On completion of the course, learner will be able to:	
DJ19AML604.1	Develop an application using fundamentals of Design Thinking.
DJ19AML604.2	Acquire hands-on proficiency in applying design thinking methodologies, processes
DJ19AML604.3	Develop a proactive attitude towards addressing societal challenges using design thinking
DJ19AML604.4	Work efficiently as a team member.

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DJ19AMEC6011 IoT Foundations

On completion of the course, learner will be able to:	
DJ19AMEC6011.1	Understand the basic architecture and organization of processor and controller..
DJ19AMEC6011.2	Discover embedded systems design principles and concepts.
DJ19AMEC6011.3	Appraise the role of IoT protocols for efficient network communication.
DJ19AMEC6011.4	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry

DJ19AMC6012 & DJ19AML6012 Time Series Analysis

On completion of the course, learner will be able to:	
DJ19AMC6012.1	To understand the basics of Time series Analysis.
DJ19AMC6012.2	To apply statistical smoothening methods for the time series data
DJ19AMC6012.3	To forecast the time series data using traditional methods
DJ19AMC6012.4	To analyze and explore the deep learning techniques for forecasting the time series data

DJ19AMC6013 & DJ19AML6013 Human Machine Interaction

On completion of the course, learner will be able to:	
DJ19AMC6013.1	Identify the various design principles used for interacting between human and machine.
DJ19AMC6013.2	Apply human psychology of everyday actions and UI design processes for real world applications.
DJ19AMC6013.3	Implement mobile, windows, and web-based application
DJ19AMC6013.4	Evaluate and justify UI design and Create an application for a social and technical task.

DJ19IHL2 Professional and Business Communication Laboratory

On completion of the course, learner will be able to:	
DJ19IHL2.1	Prepare technical documents using appropriate style, format, and language
DJ19IHL2.2	Use employability skills to optimize career opportunities
DJ19IHL2.3	Employ storytelling techniques in corporate situations
DJ19IHL2.4	Conduct effective meetings and document the process
DJ19IHL2.5	Demonstrate interpersonal skills in professional and personal situations
DJ19IHL2.6	Describe cultural differences, etiquettes, and the concept of professional ethics

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DJ19ILL2: Innovative Product Development-IV

On completion of the course, learner will be able to:	
DJ19ILL2.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL2.2	Apply knowledge and skills required to solve a societal need by conceptualising a product, especially while working in a team.
DJ19ILL2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL2.4	Draw proper inferences through theoretical/ experimental/simulations and analyse the impact of the proposed method of design and development of the product
DJ19ILL2.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ19ILL2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs
DJ19ILL2.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication.

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S.Y. B. Tech. Semester III Course Outcomes

DJ22ADC301 & DJ22ADT301 Engineering Mathematics - III & Engineering Mathematics - III Tutorial

On completion of the course, learner will be able to:	
DJ22ADC301.1	Learn the basic notation of vector spaces and subspaces.
DJ22ADC301.2	Apply the concept of vector spaces using linear transformations which is used in computer graphics and inner product spaces.
DJ22ADC301.3	Apply the concepts of eigenvalue and eigenvectors and diagonalization in linear systems.
DJ22ADC301.4	Expand the periodic function by using Fourier series and complex form of Fourier series.
DJ22ADC301.5	Apply the concept of Linear & Non-Linear Programming Problem to the engineering problems.

DJ22ADC302 & DJ22ADL302 Data Structures & Data Structures Laboratory

On completion of the course, learner will be able to:	
DJ22ADC302.1	Understand the concept of time complexity for algorithms.
DJ22ADC302.2	Assimilate the concept of various linear and non-linear data structures.
DJ22ADC302.3	Solve the problem using appropriate data structure.
DJ22ADC302.4	Implement appropriate searching and sorting algorithms for a given problem.

DJ22ADC303 & DJ22ADL303 Database Management Systems & Database Management Systems Laboratory

On completion of the course, learner will be able to:	
DJ22ADC303.1	Design an optimized database.
DJ22ADC303.2	Construct SQL queries to perform operations on the database.
DJ22ADC303.3	Demonstrate appropriate transaction management and recovery techniques for a given problem
DJ22ADC303.4	Apply indexing mechanisms for efficient retrieval of information from database

DJ22ADC304 & DJ22ADL304 Operating Systems & Operating Systems Laboratory

On completion of the course, learner will be able to:	
DJ22ADC304.1	Understand the role of Operating System in terms of process, memory, file and I/O management
DJ22ADC304.2	Apply appropriate process scheduling, memory mapping and disk scheduling methods.
DJ22ADC304.3	Identify the need of concurrency and apply the appropriate method to solve the concurrency or deadlock problem.
DJ22ADC304.4	Apply and analyze different techniques of file and I/O management.

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DJ22ADL305 Programming Laboratory – I (Python Programming)

On completion of the course, learner will be able to:	
DJ22ADL305.1	Understand basic and object-oriented concepts, data structure implementation in
DJ22ADL305.2	Apply file, directory handling and text processing concepts in python.
DJ22ADL305.3	Apply database connectivity, client-server communication using python.
DJ22ADL305.4	Develop python-based application (web/Desktop) using Django web

DJ22IHC1 & DJ22IHT1 Universal Human Values

On completion of the course, learner will be able to:	
DJ22IHC1.1	Become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have
DJ22IHC1.2	Become sensitive to their commitment towards what they have understood (human values, human relationship, and human society).
DJ22IHC1.3	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

DJ22A1 Innovative Product Development-I (A)

On completion of the course, learner will be able to:	
DJ22A1.1	Identify the requirement for a product based on societal/research needs.
DJ22A1.2	Apply knowledge and skills required to solve a societal need by conceptualising a product, especially while working in a team.
DJ22A1.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ22A1.4	Draw proper inferences through theoretical/ experimental/simulations and analyse the impact of the proposed method of design and development of the product.
DJ22A1.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ22A1.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs
DJ22A1.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral

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S.Y. B. Tech. Semester IV Course Outcomes

DJ22ADC401 & DJ22ADL401 Statistics for Engineers & Statistics for Engineers Laboratory

On completion of the course, learner will be able to:	
DJ22ADC401.1	Interpret data using descriptive statistics.
DJ22ADC401.2	Demonstrate sampling distributions and estimate statistical parameters.
DJ22ADC401.3	Develop hypothesis based on data and perform testing using various statistical techniques.
DJ22ADC401.4	Perform analysis of variance on data.
DJ22ADC401.5	Examine relations between data

DJ22ADC402 & DJ22ADL402 Artificial Intelligence & Artificial Intelligence Laboratory

On completion of the course, learner will be able to:	
DJ22ADC402.1	Classify given problem and identify the need of intelligent agent.
DJ22ADC402.2	Apply appropriate search-based method for a given problem.
DJ22ADC402.3	Analyze various AI approaches to knowledge– intensive problem solving, reasoning and planning.
DJ22ADC402.4	Design an expert system for a given AI problem.

DJ22ADC403 & DJ22ADL403 Data Mining and Analytics & Data Mining and Analytics Laboratory

On completion of the course, learner will be able to:	
DJ22ADC403.1	Apply data preprocessing techniques to clean and prepare datasets for machine learning.
DJ22ADC403.2	Conduct exploratory data analysis to understand data distributions, relationships, and outliers.
DJ22ADC403.3	Effectively use graphical representations to visualize data and communicate insights.
DJ22ADC403.4	Implement dimensionality reduction techniques to manage and analyze high-dimensional data.

DJ22ADC404 & DJ22ADL404 Design and Analysis of Algorithms & Design and Analysis of Algorithms Laboratory

On completion of the course, learner will be able to:	
DJ22ADC404.1	Analyze the performance of algorithms using asymptotic analysis.
DJ22ADC404.2	Solve the problem using appropriate algorithmic design techniques.
DJ22ADC404.3	Able to prove that certain problems are NP-Complete.

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DJ22ADL405 Design Thinking Lab

On completion of the course, learner will be able to:	
DJ22ADC405.1	Develop an application using fundamentals of Design Thinking.
DJ22ADC405.2	Acquire hands-on proficiency in applying design thinking methodologies, processes
DJ22ADC405.3	Develop a proactive attitude towards addressing societal challenges using design thinking
DJ22ADC405.4	Work efficiently as a team member.

DJ22ADL406 Full Stack Development Laboratory

On completion of the course, learner will be able to:	
DJ22ADC406.1	Implement interactive web page(s) using HTML5, CSS3 and Bootstrap.
DJ22ADC406.2	Apply JavaScript to add functionality to web page and Construct front end development using React JS
DJ22ADC406.3	Construct back end development using Django
DJ22ADC406.4	Apply the knowledge of different libraries to establish connections with databases and perform CRUD operations
DJ22ADC406.4	Implement API endpoints, handle incoming requests, validate data, and generate suitable responses.

DJS22ILLA2 Innovative Product Development-II

On completion of the course, learner will be able to:	
DJS22ILLA2.1	Identify the requirement for a product based on societal/research needs.
DJS22ILLA2.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJS22ILLA2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJS22ILLA2.4	Draw proper inferences through theoretical/ experimental/simulations and analyses the impact of the proposed method of design and development of the product.
DJS22ILLA2.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJS22ILLA2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs.

DJS22A2 Constitution of India

On completion of the course, learner will be able to:	
DJS22A2.1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
DJS22A2.2	Understand state and central policies, fundamental duties.
DJS22A2.3	Understand Electoral Process, special provisions.
DJS22A2.4	Understand powers and functions of Municipalities, Panchayats and Co- operative Societies.
DJS22A2.5	Understand Engineering ethics and responsibilities of Engineers.
DJS22A2.6	Understand Engineering Integrity & Reliability.

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T.Y. B. Tech. Semester-V Course Outcomes

DJ19ADC501 & DJ19ADL501 Machine Learning & Machine Learning Laboratory

On completion of the course, learner will be able to:	
DJ19ADC501.1	Classify given problems into classification, clustering and regression problems
DJ19ADC501.2	Apply machine learning techniques for a given problem
DJ19ADC501.3	Examine the dataset, choose appropriate algorithm and evaluate the results.
DJ19ADC501.4	Design applications using machine learning algorithms

DJ19ADC502 & DJ19ADL502 Advance Algorithms & Advance Algorithms Laboratory

On completion of the course, learner will be able to:	
DJ19ADC502.1	Analyze the algorithm.
DJ19ADC502.2	Select appropriate data structure and algorithm for given problem statement.
DJ19ADC502.3	Apply best suitable algorithms for a specific task.
DJ19ADC502.4	Classify the algorithms based on the complexity.

DJ19ADC503 & DJ19ADL503 Cloud Computing & Cloud Computing Laboratory

On completion of the course, learner will be able to:	
DJ19ADC503.1	Understand the evolution, principles, and benefits of Cloud Computing in order to assess existing cloud infrastructures to choose an appropriate architecture that meets business needs.
DJ19ADC503.2	Analyze various cloud computing service models and implement them to solve the given problems.
DJ19ADC503.3	Understand virtualization foundations to cater the needs of elasticity, portability and resilience by cloud service providers.
DJ19ADC503.4	Understand containerizing applications and services, testing them using Docker, and deploying them on a Kubernetes cluster
DJ19ADC503.5	Understand the fundamental concepts of deploying and operating in the AWS Cloud
DJ19ADC503.6	Design a cloud framework with appropriate resource management policies and mechanism.

DJ19ADL504 Data Engineering & Visualisation Lab

On completion of the course, learner will be able to:	
DJ19ADC504.1	Describe big data and use cases from selected business domains.
DJ19ADC504.2	Use Hadoop related tools such as HBase, Cassandra, Pig, and Hive for big data Analytics
DJ19ADC504.3	Build and maintain reliable, scalable, distributed systems using Apache Spark.
DJ19ADC504.4	Design and build MongoDB based Big Data Applications and learn MongoDB query language.
DJ19ADC504.5	Students will be able to demonstrate proficiency in using Tableau and Power BI to create visually compelling and interactive data visualizations on complex data sets
DJ19ADC504.6	Students will be able to communicate data-driven insights and stories through visually engaging presentations using Tableau and Power BI.

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DJ19ADC5011 & DJ19ADL5011 Devops & Devops Laboratory

On completion of the course, learner will be able to:	
DJ19ADC5011.1	Apply software engineering principles for application development.
DJ19ADC5011.2	Students will be to interpret and apply various principles, phases and activities of Agile as well as scrum methodology
DJ19ADC5011.3	Be able to understand and implement Devops principles for CI/CD
DJ19ADC5011.4	Apply testing process for application development.
DJ19ADC5011.5	Students will be able to apply Configuration Management Tools using Containerization

DJ19ADC5012 & DJ19ADL5012 Spatial Data Analytics & Spatial Data Analytics Laboratory

On completion of the course, learner will be able to:	
DJ19ADC5012.1	Demonstrate a solid understanding of the principles and theories of underlying spatial data analytics.
DJ19ADC5012.2	Apply various techniques to pre-process, clean, and manage spatial datasets.
DJ19ADC5012.3	Perform spatial analysis operations such as spatial queries and spatial indexing
DJ19ADC5011.4	Utilize GIS software and programming languages to conduct spatial data analysis.
DJ19ADC5012.5	Interpret and communicate the results of spatial data analysis effectively and apply spatial data analytics to address real-world problems and scenarios.

DJ19ADC5013 & DJ19ADL5013 Computer Graphics Virtual Reality & Computer Graphics Virtual Reality Laboratory

On completion of the course, learner will be able to:	
DJ19ADC5013.1	Implement various algorithms to generate lines, circles, curves, fractals, polygons and color them.
DJ19ADC5013.2	Apply 2D and 3D Transformations, viewing and projections on a given object.
DJ19ADC5013.3	Design an animation sequence.
DJ19ADC5013.4	Design a Virtual Reality application.

DJ19ADC5014 & DJ19ADL5014 Web Programming & Web Programming Laboratory

On completion of the course, learner will be able to:	
DJ19ADC5014.1	Implement interactive web page(s) using HTML5, CSS3 and Bootstrap
DJ19ADC5014.2	Apply JavaScript to add functionality to web pages.
DJ19ADC5014.3	Design Web Applications using Typescript.
DJ19ADC5014.4	Construct front end applications using React
DJ19ADC5014.5	Construct back end applications using Node.js/Express
DJ19ADC5014.6	Create REST Web services using MongoDB

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DJ19A3 Environmental Studies

On completion of the course, learner will be able to:	
DJ19A3.1	Understand how human activities affect environment
DJ19A3.2	Understand the various technology options that can make a difference

DJ19ILL1 Innovative Product Development-III (C)

On completion of the course, learner will be able to:	
DJ19ILL1.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL1.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJ19ILL1.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL1.4	Draw proper inferences through theoretical/ experimental/simulations and analyse the impact of the proposed method of design and development of the product.
DJ19ILL1.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ19ILL1.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs
DJ19ILL1.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral

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T.Y. B. Tech. Semester-VI Course Outcomes

DJ19ADC601 & DJ19ADL601 Deep Learning & Deep Learning Laboratory

On completion of the course, learner will be able to:	
DJ19ADC601.1	Apply supervised and unsupervised deep learning algorithms
DJ19ADC601.2	Implement deep network training and design concepts
DJ19ADC601.3	Build solution using appropriate neural network models
DJ19ADC601.4	Illustrate performance of deep learning models

DJ19ADC602 & DJ19ADL602 Natural Language Processing & Natural Language Processing Laboratory

On completion of the course, learner will be able to:	
DJ19ADC602.1	Understand the principles and Process the Human Languages Such as English and other Indian Languages using computers.
DJ19ADC602.2	Creating CORPUS linguistics based on digestive approach (Text Corpus method)
DJ19ADC602.3	Demonstrate understanding of state-of-the-art algorithms and techniques for text-based processing of natural language with respect to morphology.
DJ19ADC602.4	Perform POS tagging for a given natural language and select a suitable language modelling technique based on the structure of the language.
DJ19ADC602.5	Check the syntactic and semantic correctness of sentences using grammar and labelling.
DJ19ADC602.6	Develop Computational Methods for Real World Applications and explore deep learning-based NL

DJ19ADC603 & DJ19ADL603 Computer Vision & Computer Vision Laboratory

On completion of the course, learner will be able to:	
DJ19ADC603.1	Summarize the core concepts of computer vision and recognize its diverse applications.
DJ19ADC603.2	Analyze and explain the principles of imaging geometry, radiometry, and digitization.
DJ19ADC603.3	Recognize key image features and understand their importance in computer vision applications.
DJ19ADC603.4	Implement techniques to analyze and process images effectively
DJ19ADC603.5	Apply methods in pattern recognition, understand the significance of classifiers and their practical applications.
DJ19ADC603.6	Utilize motion analysis techniques to track dynamic actions of objects in videos

DJ19ADL604 Web and social Media Analytics Lab

On completion of the course, learner will be able to:	
DJ19ADL604.1	Identify and explain key metrics used in social and web analytics
DJ19ADL604.2	Gain proficiency in collecting and preprocessing data from various sources, including social media platforms and websites, using tools and techniques such as APIs and web scraping.
DJ19ADL604.3	Analyze web and social media performance data, interpret trends, and assess the effectiveness of online content and campaigns.
DJ19ADL604.4	Develop the ability to make informed decisions based on analytics insights, including optimizing content strategies, improving user experience, and enhancing social media engagement.

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DJ19ADC6011 & DJ19ADL6011 MLops & MLops Laboratory

On completion of the course, learner will be able to:	
DJ19ADC6011.1	Automate the deployment of ML models into the core software system or as a service component
DJ19ADC6011.2	Deploy machine learning models in a production environment.
DJ19ADC6011.3	Implement model monitoring and performance evaluation.
DJ19ADC6011.4	Manage and scale machine learning infrastructure.
DJ19ADC6011.5	Apply industry best practices for MLOps and DevOps in data science.

DJ19ADC6012 & DJ19ADL6012 Secure Software Systems & Secure Software Systems Laboratory

On completion of the course, learner will be able to:	
DJ19ADC6012.1	Conduct a comprehensive code review, identifying and remediating security vulnerabilities in a given codebase
DJ19ADC6012.2	Design and implement secure input validation and output encoding practices in a sample application.
DJ19ADC6012.3	Integrate multi-factor authentication into a sample authentication system and demonstrate a clear understanding of various authentication mechanisms.
DJ19ADC6012.4	Design and implement role-based access control (RBAC) for a sample application, ensuring the principle of least privilege.

DJ19ADC6013 & DJ19ADL6013 Distributed and Parallel Processing & Distributed and Parallel Processing

On completion of the course, learner will be able to:	
DJ19ADC6013.1	Students will be able to analyze and design distributed systems, understanding the principles of distributed computing, communication protocols, and synchronization mechanisms.
DJ19ADC6013.2	They will apply parallel programming techniques to improve the performance of algorithms and solve computationally intensive problems, demonstrating proficiency in developing scalable and efficient parallel solutions
DJ19ADC6013.3	Students will be able to design and implement distributed applications using parallel programming that are reliable, fault-tolerant, and scalable

DJ19ADC6014 & DJ19ADL6014 IoT and Fog Computing & IoT and Fog Computing Laboratory

On completion of the course, learner will be able to:	
DJ19ADC6014.1	Gain a comprehensive understanding of the Internet of Things (IoT) ecosystem, including key concepts, architectures, and communication protocols.
DJ19ADC6014.2	Examine the principles and advantages of edge computing in the IoT context, understanding its role in enhancing data processing efficiency and reducing latency.
DJ19ADC6014.3	Investigate and develop the unique security challenges of IoT devices and edge computing, including vulnerabilities, privacy concerns, and potential attack vectors.

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DJ19IHL2 Professional and Business Communication Lab

On completion of the course, learner will be able to:	
DJ19IHL2.1	Plan, organize and write technical documents like reports, proposals and research papers in the prescribed format using appropriate language and style with an understanding of ethics in written communication
DJ19IHL2.2	Apply techniques of writing resume, participating in a group discussion and facing interviews
DJ19IHL2.3	Demonstrate interpersonal skills in professional and personal situations
DJ19IHL2.4	Articulate the documentation process of meetings and conduct meetings in a professional manner
DJ19IHL2.5	Explain communication across cultures and work ethics
DJ19IHL2.6	Design and deliver effective presentations using Power Point

DJ19ILL2 Innovative Product Development-IV (D)

On completion of the course, learner will be able to:	
DJ19ILL2.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL2.2	Apply knowledge and skills required to solve a societal need by conceptualising a product, especially while working in a team.
DJ19ILL2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL2.4	Draw proper inferences through theoretical/ experimental/simulations and analyse the impact of the proposed method of design and development of the product.
DJ19ILL2.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ19ILL2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare themselves to be successful entrepreneurs
DJ19ILL2.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral

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Semester III Course Outcomes

DJS22ICC301 & DJS22ICT301 Engineering Mathematics - III

On completion of the course, learner will be able to:	
DJS22ICC301.1	Learn the basic notation of vector spaces and subspaces.
DJS22ICC301.2	Apply the concept of inner product spaces to the engineering problems.
DJS22ICC301.3	Apply the concept of vector spaces using linear transformations which is used in computer graphics and inner product spaces.
DJS22ICC301.4	Apply the concepts of eigenvalue and eigenvectors and diagonalization in linear systems.
DJS22ICC301.5	Apply the concept of Linear & Non-Linear Programming Problem to the engineering problems.

DJS22ICC302 & DJS22ICL302 Data Structures

On completion of the course, learner will be able to:	
DJS22ICC302.1	Understand the concept of time and space complexity for algorithms
DJS22ICC302.2	Assimilate the concept of various linear and non-linear data structures.
DJS22ICC302.3	Solve the problem using appropriate data structure.
DJS22ICC302.4	Implement appropriate searching and sorting technique for a given problem

DJS22ICC303 & DJS22ICL303 Database Management Systems

On completion of the course, learner will be able to:	
DJS22ICC303.1	Design an optimized database.
DJS22ICC303.2	Construct SQL queries to perform operations on the database.
DJS22ICC303.3	Demonstrate appropriate transaction management and recovery techniques for a given problem.
DJS22ICC303.4	Apply indexing mechanisms for efficient retrieval of information from database.

DJS22ICC304 & DJS22ICL304 Operating Systems

On completion of the course, learner will be able to:	
DJS22ICC304.1	Understand the role of Operating System in terms of process, memory, file and I/O management.
DJS22ICC304.2	Apply appropriate process scheduling, memory mapping and disk scheduling methods.
DJS22ICC304.3	Identify the need of concurrency and apply the appropriate method to solve the concurrency or deadlock problem.
DJS22ICC304.4	Apply and analyze different techniques of file and I/O management.

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DJS22ICL306 Programming Laboratory – I

On completion of the course, learner will be able to:	
DJS22ICL306.1	Understand basic and object-oriented concepts, data structure implementation in python.
DJS22ICL306.2	Apply file, directory handling and text processing concepts in python.
DJS22ICL306.3	Apply database connectivity, client-server communication using python.
DJS22ICL306.4	Develop python-based application (web/Desktop) using Django web framework/Tkinter.

DJS22ILLA1 Innovative Product Development-I (A)

On completion of the course, learner will be able to:	
DJS22ILLA1.1	Identify the requirement for a product based on societal/research needs.
DJS22ILLA1.2	Apply knowledge and skills required to solve a societal need by conceptualising a product, especially while working in a team.
DJS22ILLA1.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJS22ILLA1.4	Draw proper inferences through theoretical/ experimental/simulations and analyse the impact of the proposed method of design and development of the product.
DJS22ILLA1.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJS22ILLA1.6	Demonstrate capabilities of self-learning as part of the team, leading to life- long learning, which could eventually prepare themselves to be successful entrepreneurs.
DJS22ILLA1.7	Demonstrate product/project management principles during the design and development work and also excel in written (Technical paper preparation) as well as oral communication

DJS22IHC1 & DJS22IHT1 Universal Human Values

On completion of the course, learner will be able to:	
DJS22IHC1.1	Become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have better critical ability.
DJS22IHC1.2	Become sensitive to their commitment towards what they have understood (human values, human relationship, and human society).
DJS22IHC1.3	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

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S.Y. B. Tech. SEM IV Course Outcomes

DJS22ICC401 & DJS22ICL401 Statistics for Engineers

On completion of the course, learner will be able to:	
DJS22ICC401.1	Apply the concepts of probability and distributions to some case studies.
DJS22ICC401.2	Interpret and predict the basic statistical model for given data using simple linear regression.
DJS22ICC401.3	Demonstrate sampling distributions and estimate statistical parameters.
DJS22ICC401.4	Develop hypothesis based on data and perform testing using various statistical techniques.
DJS22ICC401.5	Perform analysis of variance on data.
DJS22ICC401.6	Apply the concept of Markov Process.

DJS22ICC402 & DJS22ICL402 Computer Networks

On completion of the course, learner will be able to:	
DJS22ICC402.1	Demonstrate the concepts of data communication at physical layer and compare ISO - OSI model & TCP/IP model.
DJS22ICC402.2	Exemplify the working of networking protocols at data link layer.
DJS22ICC402.3	Design the network using IP addressing and subnetting / supernetting schemes.
DJS22ICC402.4	Compare and analyze the transport layer protocols and various congestion control algorithms.
DJS22ICC402.5	Recognition of different Application layer protocols.
DJS22ICC402.6	Explore the concepts of Wireless technologies.

DJS22ICC403 & DJS22ICL403 Applied Cryptography

On completion of the course, learner will be able to:	
DJS22ICC403.1	Understand the system security goals and concepts, acquire the fundamental knowledge of modular arithmetic and number theory.
DJS22ICC403.2	Acquire the knowledge of various cryptographic techniques.
DJS22ICC403.3	Apply different encryption and decryption techniques to solve problems related to confidentiality.
DJS22ICC403.4	Learn and demonstrate the security concepts of public-key cryptography.
DJS22ICC403.5	Understand and effectively apply diverse hashing techniques to address authentication challenges.
DJS22ICC403.6	Attain proficiency in digital signature schemes and digital certificates, facilitating their effective application in secure communication systems.

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DJS22ICC404 & DJS22ICL404 Design & Analysis of Algorithms

On completion of the course, learner will be able to:	
DJS22ICC404.1	Analyze the performance of algorithms using asymptotic analysis.
DJS22ICC404.2	Solve the problem using appropriate algorithmic design techniques.
DJS22ICC404.3	Able to prove that certain problems are NP-Complete.

DJS22ICC405 & DJS22ICL405 Embedded System and IoT

On completion of the course, learner will be able to:	
DJS22ICC405.1	Understand the architecture of 8051 microcontrollers.
DJS22ICC405.2	Implement interfacing with ARM, Arduino and Raspberry Pi.
DJS22ICC405.3	Understand Internet of Things fundamentals.
DJS22ICC405.4	Explore applications in areas of IoT using sensors and actuators.
DJS22ICC405.5	Use IoT communication models and protocols.
DJS22ICC405.6	Utilize Edge analytics to perform data stream mining.

DJS22ICL406 Web Application Development Laboratory

On completion of the course, learner will be able to:	
DJS22ICL406.1	Understand Web Programming fundamental.
DJS22ICL406.2	Apply technologies required for web applications.
DJS22ICL406.3	Design and develop responsive and user-friendly web applications.
DJS22ICL406.4	Build dynamic and interactive web applications.
DJS22ICL406.5	Design and Validate web applications for conformance to latest W3C markup and accessibility standards.
DJS22ICL406.6	Apply new web development frameworks to develop mini project.

DJS22A2 Constitution of India

On completion of the course, learner will be able to:	
DJS22A2.1	Have general knowledge and legal literacy and thereby to take up competitive examinations.
DJS22A2.2	Understand state and central policies, fundamental duties.
DJS22A2.3	Understand Electoral Process, special provisions.
DJS22A2.4	Understand powers and functions of Municipalities, Panchayats and Co- operative Societies
DJS22A2.5	Understand Engineering ethics and responsibilities of Engineers.
DJS22A2.6	Understand Engineering Integrity & Reliability.

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DJS22ILLA2 Innovative Product Development II

On completion of the course, learner will be able to:	
DJS22ILLA2.1	Identify the requirement for a product based on societal/research needs.
DJS22ILLA2.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJS22ILLA2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJS22ILLA2.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product
DJS22ILLA2.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJS22ILLA2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare them to be successful entrepreneurs
DJS22ILLA2.7	Demonstrate product/project management principles during the design and development work and excel in written (Technical paper preparation) as well as oral communication

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SEM-V T.Y. B. Tech. Course Outcomes

DJ19ICC501 & DJ19ICL501 Microcontroller and Embedded Systems

On completion of the course, learner will be able to:	
DJ19ICC501.1	Identify and describe various characteristic features and applications of embedded systems.
DJ19ICC501.2	Understand AVR microcontroller architecture.
DJ19ICC501.3	Compose AVR microcontroller assembly language Programming and understand its Interface.
DJ19ICC501.4	Analyze and explain the design of Real Time Operating System (RTOS).

DJ19ICC502 & DJ19ICL502 Applied Cryptography

On completion of the course, learner will be able to:	
DJ19ICC502.1	Understand the system security goals and concepts, acquire the fundamental knowledge of modular arithmetic and number theory.
DJ19ICC502.2	Acquire the knowledge of various cryptographic techniques.
DJ19ICC502.3	Apply different encryption and decryption techniques to solve problems related to confidentiality.
DJ19ICC502.4	Understand and apply various hashing techniques, message authentication techniques and Digital Signature techniques to design secure application.

DJ19ICC503 & DJ19ICL503 Introduction to Blockchain Technology

On completion of the course, learner will be able to:	
DJ19ICC503.1	Acquire basic knowledge of Blockchain technology
DJ19ICC503.2	Understand methods for securing blockchain networks, including cryptography and consensus protocols.
DJ19ICC503.3	Use various tools for Blockchain implementation.
DJ19ICC503.4	Analyse the real-world applications of Blockchain technology.

DJ19ICC504 & DJ19ICL504 Artificial Intelligence

On completion of the course, learner will be able to:	
DJ19ICC504.1	Develop a basic understanding of AI building blocks presented in intelligent agents.
DJ19ICC504.2	Design an appropriate problem-solving method for an agent to find a sequence of actions to reach the goal state.
DJ19ICC504.3	Analyse various AI approaches to knowledge– intensive problem solving, reasoning and planning.
DJ19ICC504.4	Understand the applications of Artificial Intelligence in Semantic Web, Cyber Security and IoT.

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DJ19ICEC5011 & DJ19ICL5011 Digital Forensics

On completion of the course, learner will be able to:	
DJ19ICEC5011.1	Discuss the phases of Digital Forensics and methodology to handle the computer security incident.
DJ19ICEC5011.2	Describe the process of identification, duplication, and collection of the digital evidence.
DJ19ICEC5011.3	Describe the process of investigation and analysis of the acquired digital evidence.
DJ19ICEC5011.4	Summarize the steps involved in Evidence Handling and produce an unambiguous investigation report.
DJ19ICEC5011.5	Acquire adequate perspectives of digital forensic investigation in mobile devices.
DJ19ICEC5011.6	Explore various tools to analyze malwares and perform browser and email content authentication.

DJ19ICEC5012 & DJ19ICL5012 Network Security

On completion of the course, learner will be able to:	
DJ19ICEC5012.1	Understand the basics of Internet and OS Security.
DJ19ICEC5012.2	Study and describe different Network attacks in Internet Security.
DJ19ICEC5012.3	Study and implement different security protocols.
DJ19ICEC5012.4	Identify the function of an IDS and firewall for the system security
DJ19ICEC5012.5	Acquire adequate perspectives of digital forensic investigation in mobile devices.
DJ19ICEC5012.6	Study different mobile and cloud security mechanism.

DJ19ICEC5013 & DJ19ICL5013 Vulnerability Assessment & Penetration Testing

On completion of the course, learner will be able to:	
DJ19ICEC5013.1	To understand the basic principles for Information Gathering and Detecting Vulnerabilities in the system.
DJ19ICEC5013.2	Understand the basic of vulnerability assessment & penetration testing.
DJ19ICEC5013.3	Apply various tools and techniques to find vulnerabilities in the system.
DJ19ICEC5013.4	Aware of the various ways through which hackers' attempts to compromise an Application.

DJ19ICL506 Web Application Development Laboratory

On completion of the course, learner will be able to:	
DJ19ICL506.1	Design and develop responsive and user-friendly web applications
DJ19ICL506.2	Build dynamic and interactive web applications.
DJ19ICL506.3	Design and Validate web applications for conformance to latest W3C markup and accessibility standards.
DJ19ICL506.4	Explore new web development technologies and frameworks

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DJ19ILL1 Innovative Product Development II

On completion of the course, learner will be able to:	
DJ19ILL1.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL1.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJ19ILL1.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL1.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product
DJ19ILL1.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ19ILL1.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare them to be successful entrepreneurs
DJ19ILL1.7	Demonstrate product/project management principles during the design and development work and excel in written (Technical paper preparation) as well as oral communication

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T.Y. B.Tech. SEM-VI Course Outcomes

DJ19ICC601 & DJ19ICL601 Security in Computing

On completion of the course, learner will be able to:	
DJ19ICC601.1	Understand the system security goals and concepts.
DJ19ICC601.2	Learn programming oversight as well as various types of malicious code along with their mitigation techniques.
DJ19ICC601.3	Articulate the need of operating system security
DJ19ICC601.4	Analyze different attacks on networks and apply preventive measures on them.
DJ19ICC601.5	Identify contemporary practices of web security against web attack.
DJ19ICC601.6	Demonstrate understanding of security requirements and access controls of Database

DJ19ICC602 & DJ19ICL602 Cryptocurrency Technology

On completion of the course, learner will be able to:	
DJ19ICC601.1	Understand evolution, principles and benefits of Cryptocurrencies.
DJ19ICC601.2	Infer the various bitcoin related security and privacy issues.
DJ19ICC601.3	Analyze the real-world cryptocurrency ecosystem.
DJ19ICC601.4	Develop and deploy auction-based smart contracts on the Ethereum blockchain
DJ19ICC601.5	Design cryptocurrency with appropriate policies and mechanisms
DJ19ICC601.6	Explore applications beyond traditional cryptocurrencies.

DJ19ICEC6011 & DJ19ICL6011 Machine Learning

On completion of the course, learner will be able to:	
DJ19ICEC6011.1	Understand the types of machine learning
DJ19ICEC6011.2	Apply regression analysis to real-world problems and datasets
DJ19ICEC6011.3	Construct decision trees using different algorithms.
DJ19ICEC6011.4	Make optimal decisions based on Bayesian principles.
DJ19ICEC6011.5	Identify patterns in data and classify or cluster information into distinct categories.
DJ19ICEC6011.6	Analyze different SVM techniques.

DJ19ICEC6012 & DJ19ICL6012 Mobile Security and Forensics

On completion of the course, learner will be able to:	
DJ19ICEC6012.1	Understand the types of machine learning
DJ19ICEC6012.2	Apply regression analysis to real-world problems and datasets
DJ19ICEC6012.3	Construct decision trees using different algorithms.
DJ19ICEC6012.4	Make optimal decisions based on Bayesian principles.
DJ19ICEC6012.5	Identify patterns in data and classify or cluster information into distinct categories.
DJ19ICEC6012.6	Analyze different SVM techniques.

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DJ19ICEC6013 & DJ19ICL6013 IoT Architecture and Protocols

On completion of the course, learner will be able to:	
DJ19ICEC6013.1	Describe the IoT Characteristics and Conceptual Framework.
DJ19ICEC6013.2	Differentiate between the levels of the IoT architectures.
DJ19ICEC6013.3	Interpret sensor network and its components.
DJ19ICEC6013.4	Analyze the IoT access technologies.
DJ19ICEC6013.5	Illustrate various protocols at network layer and application layer for IoT.
DJ19ICEC6013.6	Analyze and evaluate security issues in IoT and risk analysis structure.

DJ19IHC1 & DJ19IHT1 Universal Human Values

On completion of the course, learner will be able to:	
DJ19IHC1.1	Become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have better critical ability.
DJ19IHC1.2	Become sensitive to their commitment towards what they have understood (human values, human relationship, and human society).
DJ19IHC1.3	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

DJ19IHL2 Professional and Business Communication Laboratory

On completion of the course, learner will be able to:	
DJ19IHL2.1	Prepare technical documents using appropriate style, format, and language
DJ19IHL2.2	Use employability skills to optimize career opportunities
DJ19IHL2.3	Employ storytelling techniques in corporate situations
DJ19IHL2.4	Conduct effective meetings and document the process
DJ19IHL2.5	Demonstrate interpersonal skills in professional and personal situations
DJ19IHL2.6	Describe cultural differences, etiquettes, and the concept of professional ethics

DJ19ICL603 Skill Based Course Laboratory (UI/UX Lab)

On completion of the course, learner will be able to:	
DJ19ICL603.1	Identify user requirements.
DJ19ICL603.2	Design UI/UX using appropriate methods.
DJ19ICL603.3	Generate test report using usability testing.
DJ19ICL603.4	Work effectively as a member of the team.

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DJ19ILL2 Innovative Product Development II

On completion of the course, learner will be able to:	
DJ19ILL2.1	Identify the requirement for a product based on societal/research needs.
DJ19ILL2.2	Apply knowledge and skills required to solve a societal need by conceptualizing a product, especially while working in a team.
DJ19ILL2.3	Use standard norms of engineering concepts/practices in the design and development of an innovative product.
DJ19ILL2.4	Draw proper inferences through theoretical/ experimental/simulations and analyze the impact of the proposed method of design and development of the product
DJ19ILL2.5	Develop interpersonal skills, while working as a member of the team or as the leader.
DJ19ILL2.6	Demonstrate capabilities of self-learning as part of the team, leading to life-long learning, which could eventually prepare them to be successful entrepreneurs
DJ19ILL2.7	Demonstrate product/project management principles during the design and development work and excel in written (Technical paper preparation) as well as oral communication

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B. Tech. Semester-VII Course Outcomes

Course: Process Dynamics & Control (DJ19CHC701) & Process Dynamics & Control Laboratory (DJ19CHL701)

On completion of the course, learner will be able to:	
DJ19CHC701.1	The student will be able to model dynamical systems
DJ19CHC701.2	Will be able to study their responses in Time, Laplace and Frequency domains.
DJ19CHC701.3	The student will be able to design stable controllers, for important chemical processes

Course: Process Engineering (DJ19CHC702) & Process Engineering Laboratory(DJ19CHL702)

On completion of the course, learner will be able to:	
DJ19CHC702.1	The student should be able to select the relevant Chemical Process for the economic and technological condition of the country
DJ19CHC702.2	The student should be able to evolve a Process Flow diagram for a chemical process by doing a research on the pathways to the selected compound.
DJ19CHC702.3	The student should be able to size the chemical equipment after solve the process flow sheet for mass and energy
DJ19CHC702.4	The student should be aware of Process Simulator.

Course: Nanotechnology (DJ19CHEC7011)

On completion of the course, learner will be able to:	
DJ19CHEC7011.1	Understand the essential concepts used in nanotechnology
DJ19CHEC7011.2	Gain knowledge of fabrication and characterization methods in nanotechnology.
DJ19CHEC7011.3	Gain knowledge of structure, properties, applications, and preparation techniques of nano-scale materials like Fullerenes and Carbon Nano Tubes
DJ19CHEC7011.4	Gain knowledge about importance and applications of nanotechnology in the field of biology, medicines.

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Course: Heterogeneous Catalysis (DJ19CHEC7012)

On completion of the course, learner will be able to:	
DJ19CHEC7012.1	To apply the knowledge they have gained to find the model equation and use this model to design the reactors used for heterogeneous reactions taking place in isothermal or non-isothermal conditions.

Course: Department Elective III- High Performance Leadership (DJ19CHEC7013)

On completion of the course, learner will be able to:	
DJ19CHEC7013.1	Improve one's self leadership skills through effective emotion regulation and emotional intelligence.
DJ19CHEC7013.2	Apply concepts of leadership and effective communication to individuals, groups, and organizations

Course: Food Technology: (DJ19CHEC7014)

On completion of the course, learner will be able to:	
DJ19CHEC7014.1	Understand knowledge of food essential nutrients and the various causes of food deterioration.
DJ19CHEC7014.2	Identification of appropriate processing, preservation, and packaging method.
DJ19CHEC7014.3	Students should be able to analyze product quality and effect of processing technique on it.
DJ19CHEC7014.4	They should Identify important species of pathogenic microbes and describe factors that affect their growth in various types of food.
DJ19CHEC7014.5	Analysis of food related hazards and HACCP method

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Course Outcomes of SEMESTER-VIII

Course: Modelling and Simulation (DJ19CHC801) & Modelling and Simulation Laboratory (DJ19CHL801)

On completion of the course, learner will be able to:	
DJ19CHC801.1	Form and solve linear models for Major Unit Operations and Unit Processes.
DJ19CHC801.2	Form and solve nonlinear models for few Unit Operations.
DJ19CHC801.3	Carry out sequential and equation-oriented simulation of complete flowsheets.

Course: Environmental Engineering (DJ19CHC802) & Environmental Engineering Laboratory (DJ19CHL802)

On completion of the course, learner will be able to:	
DJ19CHC802.1	To understand Importance of environmental pollution, such as air, water, solid, noise. Various pollutants sources, adverse effects, Environmental Legislation
DJ19CHC802.2	To understand meteorological aspects air pollutant dispersion. Sampling and measurement, Control Methods and Equipment:
DJ19CHC802.3	To understand Sampling, measurement of various water pollutants.
DJ19CHC802.4	To understand and design various Waste Water Treatments

Course: Petroleum Refining and Technology (Department Elective) (DJ19CHEC8011)

On completion of the course, learner will be able to:	
DJ19CHEC8011.1	Characterize crude petroleum and petroleum refinery
DJ19CHEC8011.2	Fractionate crude petroleum into useful fractions
DJ19CHEC8011.3	Measure important physical properties of petroleum products
DJ19CHEC8011.4	Apply refinery processes to maximize desired petro products
DJ19CHEC8011.5	Use treatment techniques to purify petro products
DJ19CHEC8011.6	Knowledge about Bio –Refinery & alternate source of energy

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Course: Advanced Separation Processes (DJ19CHEC8012)

On completion of the course, learner will be able to:	
DJ19CHEC8012.1	Learn various adsorption processes and designs.
DJ19CHEC8012.2	Learn supercritical extraction and modern distillation process.
DJ19CHEC8012.3	Learn foam fractionation process and typical applications.
DJ19CHEC8012.4	Learn liquid chromatographic processes with applications.
DJ19CHEC8012.5	Learn membrane processes, characterization of membranes and membrane modules.

Course: Project Engineering & Entrepreneurship Management (DJ19CHEC8013)

On completion of the course, learner will be able to:	
DJ19CHEC8013.1	To prepare students for an exciting, challenging and rewarding managerial career.
DJ19CHEC8013.2	To insight students in identifying opportunities, creating and starting a venture, financing and managing the venture.

Course: Instrumentation (DJ19CHEC8014)

On completion of the course, learner will be able to:	
DJ19CHEC8014.1	The student will be able to calculate the output of various measuring schemes
DJ19CHEC8014.2	The student will be able to select a DAQ card for any given application
DJ19CHEC8014.3	The student will be able to select the appropriate type of instrument for any application
DJ19CHEC8014.4	The student will be able to prepare a basic control scheme for process units
DJ19CHEC8014.5	The student will be able to write programs for a PLC.

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B. Tech. Semester: VII Course Outcomes

DJ19ELXC701 & DJ19ELXL701-Artificial Intelligence and Machine Learning & Artificial Intelligence and Machine Learning Laboratory

After completing the course, Student will be able to:	
DJ19ELXC701.1	Develop a basic understanding of AI building blocks presented in intelligent agents.
DJ19ELXC701.2	Design appropriate problem solving method for an agent to find a sequence of actions to reach goal state.
DJ19ELXC701.3	Analyze various AI approaches to knowledge intensive problem solving, reasoning and planning.
DJ19ELXC701.4	Gain knowledge about basic concepts of Machine Learning 5. Solve the problems using various machine learning techniques

DJ19ELXC702 & DJ19ELXL702- IoT Enterprise Network & IoT Enterprise Network Laboratory

After completing the course, Student will be able to:	
DJ19ELXC702.1	Outline application & link layer services for wired and wireless applications
DJ19ELXC702.2	Design & optimize – sensors, power modules and actuation for constrained environment applications
DJ19ELXC702.3	Comprehend and evaluate the mechanism needed for network security of application environment
DJ19ELXC702.4	Demonstrate the use of SaaS, PaaS and IaaS services

DJ19ELEC7031 & DJ19ELEL7031-Advanced Digital Signal Processing & Advanced Digital Signal Processing Laboratory

After completing the course, Student will be able to:	
DJ19ELEC7031.1	Analyze the effect of hardware limitations on performance of digital filters.
DJ19ELEC7031.2	Implement multistage sampling rate conversion.
DJ19ELEC7031.3	Analyze linear prediction methods and optimum linear filters
DJ19ELEC7031.4	Implement adaptive filters for given applications.
DJ19ELEC7031.5	Analyze wavelet theory for various applications

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DJ19ELEC7032 & DJ19ELEC7032-Cloud Computing & Cloud Computing Laboratory

After completing the course, Student will be able to:	
DJ19ELEC7032.1	Implement Virtualization using different types of hypervisors.
DJ19ELEC7032.2	Provide the appropriate cloud computing solutions.
DJ19ELEC7032.3	Design & develop backup strategies for cloud data.

DJ19ELEC7033 & DJ19ELEL7033-Satellite and Optical Fiber Communication & Satellite and Optical Fiber Communication Laboratory

After completing the course, Student will be able to:

DJ19ELEC7033.1	Differentiate satellite orbits and orbital parameters.
DJ19ELEC7033.2	Describe different satellite sub-systems operation and earth station technology.
DJ19ELEC7033.3	Elaborate various applications of satellite communications.
DJ19ELEC7033.4	Describe the fundamentals and transmission characteristics of optical fiber Communication.
DJ19ELEC7033.5	Analyze various optical sources, detectors and fiber optic components.
DJ19ELEC7033.6	Analyze the optical link budget.

DELXP704-Project - I

After completing the course, Student will be able to:	
DELXP704.1	Do literature survey/industrial visit and identify the problem
DELXP704.2	Apply basic engineering fundamental in the domain of practical applications.
DELXP704.3	Cultivate the habit of working in a team
DELXP704.4	Attempt a problem solution in a right approach
DELXP704.5	Correlate the theoretical and experimental/simulations results and draw the proper inferences.
DELXP704.6	Prepare report as per the standard guidelines

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B. Tech. Semester VIII Course Outcomes

DJ19ELXC801 & DJ19ELXL801-Robotics and Industrial Automation & Robotics and Industrial Automation Laboratory

After completing the course, Student will be able to:	
DJ19ELXC801.1	To understand various robot parameters and its applications.
DJ19ELXC801.2	To apply knowledge of D-H algorithms for robot model representation
DJ19ELXC801.3	To analyze kinematics of robots.
DJ19ELXC801.4	Distinguish different path and trajectory.
DJ19ELXC801.5	Analyze the controller parameters for discrete or continuous type
DJ19ELXC801.6	Design the process controller (electronic) for a given process or application

DJ19ELXC802 & DJ19ELXL802- Digital Image Processing & Digital Image Processing Laboratory

After completing the course, Student will be able to:	
DJ19ELXC802.1	Illustrate & make use of the fundamental concepts and basic elements of digital image processing.
DJ19ELXC802.2	Apply image enhancement in spatial domain, frequency domain and using histogram modeling.
DJ19ELXC802.3	Apply different image segmentation and representation techniques on images.
DJ19ELXC802.4	Examine different morphological operations used in binary image processing.
DJ19ELXC802.5	Analyze image in frequency domain through different transforms.
DJ19ELXC802.6	Analyze different image compression techniques

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DJ19ELEC8041 & DJ19ELEL8041-IC and Bio-MEMS Technology & IC and Bio-MEMS Technology Laboratory

After completing the course, Student will be able to:	
DJ19ELEC8041.1	Demonstrate a clear understanding of various MOS fabrication processes & CMOS fabrication flow.
DJ19ELEC8041.2	Develop or modify the MEMS processes for a simple MEMS device in order to reduce the fabrication time.
DJ19ELEC8041.3	Analyze micro total analysis system with designing of its components
DJ19ELEC8041.4	Demonstrate working principles of different types of Bio Nano-sensors and drug delivery devices along with their fabrication process.

DJ19ELEC8042 & DJ19ELEL8042-Big Data Analytics & Big Data Analytics Laboratory

After completing the course, Student will be able to:	
DJ19ELEC8042.1	Understand the key issues in big data management.
DJ19ELEC8042.2	Acquire fundamental enabling techniques using tools in big data analytics.
DJ19ELEC8042.3	Achieve adequate perspectives of big data analytics in various applications like sensor, recommender systems, social media applications etc.

DJ19ELEC8043 & DJ19ELEC8043-Advanced Networking Technologies & Advanced Networking Technologies Laboratory

After completing the course, Student will be able to:	
DJ19ELEC8043.1	Evaluate/ Design Small – Medium Scale Networks from access layer to backbone layer
DJ19ELEC8043.2	Design for Emerging areas such as Iot and IIoT
DJ19ELEC8043.3	Migrate designs to new technologies that are high speed-high security-high QoS Networks

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DJ19ILO8021-Project Management

After completing the course, Student will be able to:	
DJ19ILO8021.1	Explain project management life cycle and the various project phases as well as the role of project manager.
DJ19ILO8021.2	Apply selection criteria and select an appropriate project from different options.
DJ19ILO8021.3	Create a work break down structure for a project and develop a schedule based on it. Manage project risk strategically.
DJ19ILO8021.4	Use Earned value technique and determine & predict status of the project.
DJ19ILO8021.5	Capture lessons learned during project phases and document them for future reference.

DJ19ILO8022-Entrepreneurship Development and Management

After completing the course, Student will be able to:	
DJ19ILO8022.1	Develop idea generation, creative and innovative skills
DJ19ILO8022.2	Prepare a Business Plan
DJ19ILO8022.3	Compare different entrepreneur supporting institutions
DJ19ILO8022.4	Correlate suitable MSME scheme for an entrepreneur
DJ19ILO8022.5	Interpret financial and legal aspect of a business

DJ19ILO8025-Corporate Finance Management

After completing the course, Student will be able to:	
DJ19ILO8025.1	Understand Indian finance system.
DJ19ILO8025.2	Apply concepts of time value money and risk returns to product, services and business.
DJ19ILO8025.3	Understand corporate finance; evaluate and compare performance of multiple firms.
DJ19ILO8025.4	Take Investment, finance as well as dividend decisions

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DJ19ILO8029-Environmental Management

After completing the course, Student will be able to:	
DJ19ILO8029.1	Identify Environmental issues and get familiarized to the concept of Ecosystem and environmental management.
DJ19ILO8029.2	Know policies and legal aspects and understand EM system standards.
DJ19ILO8029.3	Understand Environment Impact assessment.
DJ19ILO8029.4	Understand Environment Auditing procedures.
DJ19ILO8029.5	Describe Environmental management Techniques

DELXP804-Project - II

After completing the course, Student will be able to:	
DELXP804.1	Do literature survey/industrial visit and identify the problem
DELXP804.2	Apply basic engineering fundamental in the domain of practical applications.
DELXP804.3	Cultivate the habit of working in a team.
DELXP804.4	Attempt a problem solution in a right approach.
DELXP804.5	Correlate the theoretical and experimental/simulations results and draw the proper inferences.
DELXP804.6	Prepare report as per the standard guidelines.

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F.Y. B. Tech. Semester –I & II Common Subjects Course Outcomes

Course: Basic Electrical Engineering & Digital Electronics (DJS23FCES103)	
Course: Basic Electrical Engineering & Digital Electronics Laboratory & Tutorial (DJS23FLES103)	
On completion of the course, learner will be able to:	
DJS23FCES103.1	Apply the knowledge of theorems/laws to analyse the DC circuits
DJS23FCES103.2	Analyse single phase AC circuits
DJS23FCES103.3	Demonstrate knowledge of basic number system, logic gates and sequential circuits

Course: Engineering Chemistry (DJS23FCBS103)	
Course: Engineering Chemistry Laboratory & Tutorial DJS22FELEP)	
On completion of the course, learner will be able to:	
DJS23FCBS103.1	Recognize new approaches of chemical analysis, which are more convenient, less hazardous and sustainable to perform.
DJS23FCBS103.2	Describe applications based on nanomaterials and modern polymers in engineering techniques
DJS23FCBS103.3	Analyze the quality of fuel for energy efficiency.
DJS23FCBS103.4	Recognize properties of materials and alloys with phase transformation.
DJS23FCBS103.5	Identify the parameters responsible for water pollution using suitable methods of water treatment.

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Course: Effective Communication Skills- (DJS23FCHS101)	
Course: Effective Communication Skills Laboratory (DJS23FLHS101)	
On completion of the course, learner will be able to:	
DJS23FCHS101.1	Use skills related to the various aspects of communication to express ideas with greater clarity
DJS23FCHS101.2	Apply appropriate verbal/non-verbal cues in social and workplace situations and overcome the barriers to communication
DJS23FCHS101.3	Employ personal development strategies for self-assessment, goal setting and maintaining a professional persona online

Course: Engineering Graphics (DJS23FCES104)	
Course: Engineering Graphics Laboratory (DJS23FLES104)	
On completion of the course, learner will be able to:	
DJS23FCES104.1	Recognize the value of engineering graphics, as a language of
DJS23FCES104.2	Construct orthographic views of basic shapes of solids
DJS23FCES104.3	Interpret and sketch orthographic and sectional orthographic views of various machine components.
DJS23FCES104.4	Visualize objects, and draw isometric views.
DJS23FCES104.5	Build 2D sketches using Auto CAD.

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Course: Indian Knowledge System (DJS23FTHS102)	
On completion of the course, learner will be able to:	
DJS23FTHS102.1	Understand the history of Indian education system.
DJS23FTHS102.2	Learn about Indian Scientists and their inventions.
DJS23FTHS102.3	Understand and appreciate the various art forms and architecture in India.
DJS23FTHS102.4	Illustrate the classic literature written in Indian languages.
DJS23FTHS102.5	Know the various religions followed in India and their philosophies.

Course: Liberal Learning -Proposed Course: A Health and Wellness- Mind and Body Management (DJS23FTLL101)	
On completion of the course, learner will be able to:	
DJS23FTLL101.1	Use the knowledge of Health and wellness in daily life.
DJS23FTLL101.2	Apply appropriate and innovative methods to avoid risks from harmful habits.
DJS23FTLL101.3	Employ personal development (both physical and emotional) strategies for better living
DJS23FTLL101.4	Create a plan for good health through a positive mindset.

Course: Computational Engineering Mechanics (DJS23FCES102)	
Course: Computational Engineering Mechanics Laboratory (DJS23FLES102)	
On completion of the course, learner will be able to:	
DJS23FCES102.1	Illustrate the effect of force and moment to determine the resultant of force system
DJS23FCES102.2	Apply the concept of equilibrium systems with the help of free body diagram.
DJS23FCES102.3	Correlate real life application to friction and estimate the Power transmitted by the belt.
DJS23FCES102.4	Apply the concept of geometric transformations to find the transformed position of an element/object.

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F.Y. B. Tech. Semester –I Course Outcomes

Course: Mathematics - I (DJS23FCBS101)	
Course: Mathematics - I Tutorial (DJS23FTBS101)	
On completion of the course, learner will be able to:	
DJS23FTBS101.1	solve homogeneous and non-homogenous linear system of equations.
DJS23FTBS101.2	solve problems of hyperbolic and logarithmic functions using complex numbers.
DJS23FTBS101.3	use expansion of functions in engineering problems.
DJS23FTBS101.4	find maxima - minima and Jacobians using partial differentiation.
DJS23FTBS101.5	find the solution of linear system of equations, transcendental equations and curve fitting of given data using numerical methods and various libraries of SciLab

Course: Structured Programming Using C (DJS23FCES11)	
Course: Structured Programming Using C Laboratory (DJS23FLES11)	
On completion of the course, learner will be able to:	
DJS23FCES11.1	Implement the programs in C.
DJS23FCES11.2	Debug the C programs

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F.Y. B. Tech. Semester –II Course Outcomes

Course: Mathematics - II (DJS23FCBS201)	
Course: Mathematics - II Tutorial (DJS23FTBS201).	
On completion of the course, learner will be able to:	
DJS23FTBS201.1	Solve Beta and Gamma function, DUIS and rectification of plane curves.
DJS23FTBS201.2	Solve Multiple integrals.
DJS23FTBS201.3	Find Area, Volume, and Mass of Lamina by applying the concepts of Multiple Integrals.
DJS23FTBS201.4	Solve various types of First Order and Higher Order differential equations.
DJS23FTBS201.5	Find the solutions of First Order Differential Equations and Integration by using Numerical Method and various libraries of scilab.

Course: Object Oriented Programming using Java (DJS23FCES201)	
Course: Object Oriented Programming using Java Laboratory (DJS23FLES201)	
On completion of the course, learner will be able to:	
DJS23FCES201.1	Develop programs by applying Object-Oriented concepts of JAVA to solve real-world problems.
DJS23FCES201.2	Achieve Robustness and Concurrency while developing programs (Exception Handling and Multithreading).
DJS23FCES201.3	Design Graphical User Interface using swing.