Program : Artificial Intelligence and Data Science	
Third Year : Semester - V	
Course Code: CSC501	**Course Name: Computer Network**
CSC501.1	Demonstrate the concepts of data communication at the physical layer and compare ISO - OSI model with TCP/IP model.
CSC501.2	Explore different design issues at data link layer.
CSC501.3	Design the network using IP addressing and subnetting / supernetting schemes.
CSC501.4	Analyze transport layer protocols and congestion control algorithms.
CSC501.5	Explore protocols at application layer.
CSC501.6	Understand the customer requirements and Apply a Methodology to Network Design and software defined networks.
Course Code: CSC502	**Course Name: Web Computing**
CSC502.1	Select protocols or technologies required for various web applications 2. 3 Apply JavaScript to add functionality to web pages.
CSC502.2	Apply JavaScript to add functionality to web pages.
CSC502.3	Apply JavaScript to add functionality to web pages.
CSC502.4	Construct web based Node.js applications using Express.
CSC502.5	Design front end applications using functional components of React.
CSC502.6	Design back-end applications using Node.js.
Course Code: CSC503	**Course Name: Artificial Intelligence**
CSC503.1	Identify the characteristics of the environment and differentiate between various agent architectures.
CSC503.2	Apply the most suitable search strategy to design problem solving agents.
CSC503.3	Represent a natural language description of statements in logic and apply the inference rules to design Knowledge Based agents.
CSC503.4	Apply a probabilistic model for reasoning under uncertainty.
CSC503.5	Comprehend various learning techniques.
CSC503.6	Describe the various building blocks of an expert system for a given real word problem.

Program : Artificial Intelligence and Data Science	
Third Year : Semester - V	
Course Code: CSC504	**Course Name: Data Warehousing and Mining**
CSC504.1	Organize strategic data in an enterprise and build a data Warehouse.
CSC504.2	Analyze data using OLAP operations so as to take strategic decisions and demonstrate an understanding of the importance of data mining.
CSC504.3	Organize and prepare the data needed for data mining using pre preprocessing techniques
CSC504.4	Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.
CSC504.5	Define and apply metrics to measure the performance of various data mining algorithms.
CSC504.6	Understand Concepts related to Web mining.
Course Code: CSDLO5011	**Course Name: Statistics for Artificial Intelligence Data Science**
CSDLO5011.1	Illustrate Exploratory Data Analysis.
CSDLO5011.2	Describe Data and Sampling Distributions.
CSDLO5011.3	Solve Statistical Experiments and Significance Testing.
CSDLO5011.4	Demonstrate Summarizing Data.
CSDLO5011.5	Interpret the Analysis of Variance.
CSDLO5011.6	Use Linear Least Squares.
Course Code: CSL501	**Course Name: Web Computing and Network Lab**
CSL501.1	Identify and apply the appropriate HTML tags to develop a webpage.
CSL501.2	Identify and apply the appropriate CSS tags to format data on webpage.
CSL501.3	Construct responsive websites using Bootstrap.
CSL501.4	Use JavaScript to develop interactive web pages.
CSL501.5	Construct front end applications using React and back end using Node.js/express.
CSL501.6	Use simulator for CISCO packet tracer/GNS3.

Program : Artificial Intelligence and Data Science	
Third Year : Semester - V	
Course Code: CSL502	**Course Name: Artificial Intelligence Lab**
CSL502.1	Identify suitable Agent Architecture for a given real world AI problem.
CSL502.2	Implement simple programs using Prolog.
CSL502.3	Implement various search techniques for a Problem-Solving Agent.
CSL502.4	Represent natural language description as statements in Logic and apply inference rules to it.
CSL502.5	Construct a Bayesian Belief Network for a given problem and draw probabilistic inferences from it.
Course Code: CSL503	**Course Name: Data Warehousing and Mining Lab**
CSL503.1	Build a data warehouse.
CSL503.2	Analyze data using OLAP operations so as to take strategic decisions.
CSL503.3	Demonstrate an understanding of the importance of data mining.
CSL503.4	Organize and prepare the data needed for data mining using pre preprocessing techniques.
CSL503.5	Perform exploratory analysis of the data to be used for mining.
CSL503.6	Implement the appropriate data mining methods like classification, clustering or Frequent Pattern mining on large data sets.
Course Code: CSL504	**Course Name: Business Communication & Ethics II**
CSL504.1	Plan and prepare effective business/ technical documents which will in turn provide solid foundation for their future managerial roles.
CSL504.2	Strategize their personal and professional skills to build a professional image and meet the demands of the industry.
CSL504.3	Emerge successful in group discussions, meetings and result-oriented agreeable solutions in group communication situations.
CSL504.4	Deliver persuasive and professional presentations.
CSL504.5	Develop creative thinking and interpersonal skills required for effective professional communication.
CSL504.6	Apply codes of ethical conduct, personal integrity and norms of organizational behavior.

Program : Artificial Intelligence and Data Science	
Third Year : Semester - V	
Course Code: CSM501	**Course Name: Mini Project 2A**
CSM501.1	Identify societal/research/innovation/entrepreneurship problems through appropriate literature surveys.
CSM501.2	Identify Methodology for solving above problem and apply engineering knowledge and skills to solve it.
CSM501.3	Validate, Verify the results using test cases/benchmark data/theoretical/ inferences/experiments/simulations.
CSM501.4	Analyze and evaluate the impact of solution/product/research/innovation /entrepreneurship towards societal/environmental/sustainable development.
CSM501.5	Use standard norms of engineering practices and project management principles during project work.
CSM501.6	Communicate through technical report writing and oral presentation. ● The work may result in research/white paper/ article/blog writing and publication. ● The work may result in business plan for entrepreneurship product created. ● The work may result in patent filing.
CSM501.7	Gain technical competency towards participation in Competitions, Hackathons, etc.
CSM501.8	Demonstrate capabilities of self-learning, leading to lifelong learning.
CSM501.9	Develop interpersonal skills to work as a member of a group or as leader.

Program : Artificial Intelligence and Data Science	
Third Year : Semester - VI	
Course Code: CSC601	**Course Name: Data Analytics and Visualization**
CSC601.1	Comprehend basics of data analytics and visualization.
CSC601.2	Apply various regression models on a given data set and perform prediction.
CSC601.3	Demonstrate advance understanding of Time series concepts and analysis of data using various time series models.
CSC601.4	Analyze Text data and gain insights.
CSC601.5	Experiment with different analytics techniques and visualization using R.
CSC601.6	Experiment with different analytics techniques and visualization using Python.
Course Code: CSC602	**Course Name: Cryptography and System Security**
CSC602.1	Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory.
CSC602.2	Understand, compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication.
CSC602.3	Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes.
CSC602.4	Apply different digital signature algorithms to achieve authentication and create secure applications.
CSC602.5	Apply network security basics, analyze different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP.
CSC602.6	Apply the knowledge of cryptographic utilities and authentication mechanisms to design secure applications.
Course Code: CSC603	**Course Name: Software Engineering and Project Management**
CSC603.1	Understand and use basic knowledge in software engineering.
CSC603.2	Identify requirements, analyze and prepare models.
CSC603.3	Plan, schedule and track the progress of the projects.
CSC603.4	Design & develop the software solutions for the growth of society.
CSC603.5	Apply testing and assure quality in software solutions.
CSC603.6	Generate project schedules and can construct, design and develop network diagrams for different types of Projects. They can also organize different activities of project.

Program : Artificial Intelligence and Data Science	
Third Year : Semester - VI	
Course Code: CSC604	**Course Name: Machine Learning**
CSC604.1	Comprehend basics of Machine Learning.
CSC604.2	Build Mathematical foundation for machine learning.
CSC604.3	Understand various Machine learning models.
CSC604.4	Select suitable Machine learning models for a given problem.
CSC604.5	Build Neural Network based models.
CSC604.6	Apply Dimensionality Reduction techniques.
Course Code: CSDLO6012	**Course Name: Distributed Computing**
CSDLO6012.1	Demonstrate knowledge of the basic elements and concepts related to distributed system technologies.
CSDLO6012.2	Illustrate the middleware technologies that support distributed applications such as RPC, RMI and Object based middleware.
CSDLO6012.3	Analyze the various techniques used for clock synchronization and mutual exclusion.
CSDLO6012.4	Demonstrate the concepts of Resource and Process management and synchronization algorithms.
CSDLO6012.5	Demonstrate the concepts of Consistency and Replication Management.
CSDLO6012.6	Apply the knowledge of Distributed File System to analyze various file systems like NFS, AFS and the experience in building large-scale distributed applications.
Course Code: CSL601	**Course Name: Data Analytics and Visualization Lab**
CSL601.1	Explore various data analytics Libraries in R and Python.
CSL601.2	Implement various Regression techniques for prediction.
CSL601.3	Build various time series models on a given data set.
CSL601.4	Design Text Analytics Application on a given data set.
CSL601.5	Implement visualization techniques to given data sets using R.
CSL601.6	Implement visualization techniques to given data sets using Python.

Program : Artificial Intelligence and Data Science	
Third Year : Semester - VI	
Course Code: CSL602	**Course Name: Cryptographic and System Security Lab**
CSL602.1	Apply the knowledge of symmetric cryptography to implement simple ciphers.
CSL602.2	Analyze and implement public key algorithms like RSA and El Gamal.
CSL602.3	Analyze and evaluate performance of hashing algorithms.
CSL602.4	Explore the different network reconnaissance tools to gather information about networks.
CSL602.5	Use tools like sniffers, port scanners and other related tools for analyzing packets in a network.
CSL602.6	Apply and set up firewalls and intrusion detection systems using open-source technologies and to explore email security.
Course Code: CSL603	**Course Name: Software Engineering and Project Management Lab**
CSL603.1	To understand the fundamentals of DevOps engineering and be fully proficient with DevOps terminologies, concepts, benefits, and deployment options to meet your business requirements.
CSL603.2	To obtain complete knowledge of the ―version control system‖ to effectively track changes augmented with Git and GitHub.
CSL603.3	Understand the importance of Selenium and Jenkins to test Software Applications.
CSL603.4	To understand the importance of Jenkins to Build and deploy Software Applications on server Environment.
CSL603.5	To understand concept of containerization and Analyze the Containerization of OS images and deployment of applications over Dockerk.
CSL603.6	To Synthesize software configuration and provisioning using Ansible.
Course Code: CSL604	**Course Name: Machine Learning Lab**
CSL604.1	Implement various Machine learning models.
CSL604.2	Apply suitable Machine learning models for a given problem.
CSL604.3	Implement Neural Network based models.
CSL604.4	Apply Dimensionality Reduction techniques.

Program : Artificial Intelligence and Data Science	
Third Year : Semester - VI	
Course Code: CSL605	**Course Name: Cloud Computing Lab**
CSL605.1	Implement different types of virtualization techniques.
CSL605.2	Analyze various cloud computing service models and implement them to solve the given problems.
CSL605.3	Design and develop real world web applications and deploy them on commercial cloud(s).
CSL605.4	Explain major security issues in the cloud and mechanisms to address them.
CSL605.5	Explore various commercially available cloud services and recommend the appropriate one for the given application.
CSL605.6	Implement the concept of containerization.
Course Code: CSM601	**Course Name: Mini Project 2-B**
CSM601.1	Identify societal/research/innovation/entrepreneurship problems through appropriate literature surveys
CSM601.2	Identify Methodology for solving above problem and apply engineering knowledge and skills to solve it
CSM601.3	Validate, Verify the results using test cases/benchmark data/theoretical/ inferences/experiments/simulations
CSM601.4	Analyze and evaluate the impact of solution/product/research/innovation /entrepreneurship towards societal/environmental/sustainable development
CSM601.5	Use standard norms of engineering practices and project management principles during project work
CSM601.6	Communicate through technical report writing and oral presentation. ● The work may result in research/white paper/ article/blog writing and publication ● The work may result in business plan for entrepreneurship product created ● The work may result in patent filing.
CSM601.7	Gain technical competency towards participation in Competitions, Hackathons, etc.
CSM601.8	Demonstrate capabilities of self-learning, leading to lifelong learning.
CSM601.9	Develop interpersonal skills to work as a member of a group or as leader.