COURSE OUTCOMES - 2022 SCHEME (PG)

1st SEMESTER

Subject:	**Mathematics Course Stream**		
Subject Code:	**22SCS11**	**NBA Code:**	**22PSCS101**
CO1	Understand vector spaces and related topics arising in magnification and rotation of images.		
CO2	Compute orthogonal and orthonormal basis vectors required to analyze image and signal Processing problems		
CO3	Apply the technique of singular value decomposition for data compression, least square and approximation in solving in consistent linear systems		
CO4	Understand probabilistic concepts required to test the hypothesis and take decision using Analysis of variance		
CO5	Understand one and two dimensional Fourier transform		

Subject:	**Fundamentals of Data Sciences**		
Subject Code:	**22SCS12**	**NBA Code:**	**22PSCS102**
CO1	Understand the fundamental concepts of data science, including its definition, scope, and applications across various industries		
CO2	Develop proficiency in exploratory data analysis (EDA) techniques and understand the iterative data science process.		
CO3	Gain hands-on experience in implementing and evaluating machine learning algorithms for practical applications.		
CO4	Acquire skills in feature engineering, selection, and building recommendation systems.		
CO5	Understand data engineering principles, Map Reduce frameworks, and principles of effective data visualization.		

Subject:	**Advances in Computer Networks**		
Subject Code:	**22SCS13**	**NBA Code:**	**22PSCS103**
CO1	Define the foundational principles of networking, including requirements, scalability, and protocol layering.		
CO2	Explain the basics of internetworking, including IP addressing, subnetting, and address resolution (ARP)..		
CO3	Analyze routing protocols (e.g., RIP, OSPF, BGP) and their role in global Internet connectivity		
CO4	Implement end-to-end protocols like TCP and UDP, understanding their reliability and congestion control mechanisms		
CO5	Discuss advanced networking topics such as congestion avoidance, DNS, email protocols (SMTP, POP, IMAP), and HTTP for web communication		

Subject:	Internet of Things and Applications		
Subject Code:	22SCS14	NBA Code:	22PSCS104
CO1	Define and explain the concept of Internet of Things (IoT), including motivations and examples of applications.		
CO2	Identify and describe key IoT technologies and standards, such as RPL, CoAP, and IPSO		
CO3	Analyze wireless and cellular technologies for IoT connectivity, including IPv6 capabilities and migration strategies		
CO4	Examine real-world case studies illustrating IoT design in various domains like home automation, smart cities, and agriculture		
CO5	Introduce data analytics tools and techniques for IoT data processing, including Apache Hadoop, Spark, and Storm for batch and real-time analysis		

Subject:	Advanced Algorithms		
Subject Code:	22SCS15	NBA Code:	22PSCS105
CO1	Understand and apply asymptotic notations (Big O, Theta, Omega) to analyze the growth rate of functions		
CO2	Implement graph algorithms such as Bellman-Ford, Johnson's Algorithm, and Ford-Fulkerson for network flow problems		
CO3	Apply number-theoretic algorithms including GCD, modular arithmetic, and RSA cryptosystem for cryptography applications.		
CO4	Compare and implement string-matching algorithms like Rabin-Karp, Knuth-Morris-Pratt, and Boyer-Moore for efficient pattern searching		
CO5	Analyze and design probabilistic and randomized algorithms, including Monte Carlo and Las Vegas algorithms for specific computational problems.		

Subject:	Research Methodology and IPR		
Subject Code:	22RMI16	NBA Code:	22PSCS106
CO1	Define the meaning of research and its objectives, emphasizing the importance of motivation and various types and approaches to research		
CO2	Learn how to review existing literature effectively, develop theoretical frameworks, and grasp various research design concepts.		
CO3	Gain knowledge of sampling techniques, measurement scales, and methods for collecting data through experiments and surveys		
CO4	Acquire skills in hypothesis testing for different parameters (mean, proportion, variance), interpret statistical results, and understand the Chi-square test for analyzing categorical data		
CO5	Develop the ability to interpret research findings, write comprehensive reports, and understand the basics of intellectual property rights (IPR) and related conventions		

Subject:	Internet of Things Laboratory		
Subject Code:	22SCS17	NBA Code:	22PSCS107
CO1	Configure and establish UART communication for transmitting and receiving data between microcontrollers or embedded systems		
CO2	Demonstrate proficiency in setting up and managing point-to-point communication using RF modules between two Motes.		
CO3	Develop expertise in designing and deploying a multi-point RF communication network among Motes, employing subnetting techniques for efficient data routing		
CO4	Gain a comprehensive understanding of the I2C protocol, including its applications, working principles, and protocol-specific functionalities.		
CO5	Acquire the ability to interface with sensors to collect and process temperature and relative humidity data, enabling practical applications in environmental monitoring and control.		

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2nd SEMESTER

Subject:	**Big Data Analytics**		
Subject Code:	**22SCS21**	**NBA Code:**	**22PSCS108**
CO1	Interpret managing big data using Hadoop and SPARK technologies		
CO2	Explain HDFS and MapReduce concepts		
CO3	Install, configure, and run Hadoop and HDFS		
CO4	Perform map-reduce analytics using Hadoop and related tools		
CO5	Explain SPARK concepts		

Subject:	**Artificial Intelligence and Machine Learning**		
Subject Code:	**22SCS22**	**NBA Code:**	**22PSCS109**
CO1	Define artificial intelligence (AI) and identify problem-solving techniques using state space search and control strategies.		
CO2	Demonstrate the application of logic concepts and logic programming in solving AI problems, focusing on problem reduction and game playing strategies.		
CO3	Use planning techniques and knowledge representation methods to solve complex AI problems..		
CO4	Handle uncertainty with probability theory and Bayesian networks, and explore supervised and unsupervised learning in AI		
CO5	Implement support vector machines for classification, apply case-based reasoning, and understand different types of neural networks in AI		

Subject:	**Mobile Application Development**		
Subject Code:	**22SCS232**	**NBA Code:**	**22PSCS110**
CO1	Understand mobile computing basics, GSM architecture, and mobile services.		
CO2	Master Android development using SDK, creating projects, and working with UI components.		
CO3	Learn Android app design using activities, services, UI layout, and graphics animation.		
CO4	Develop advanced Android apps with views, widgets, multimedia, and internet services.		
CO5	Deploy Android apps, integrate web and SMS/email features, and publish apps in marketplaces.		

Subject:	**Object Oriented Design**		
Subject Code:	**22SCS242**	**NBA Code:**	**22PSCS111**
CO1	Identify the heuristics of the object-oriented programming		
CO2	Explain the fundamentals of OOP		
CO3	Examine fine object-oriented relations		
CO4	Explain the role of Physical Object-Oriented Design		
CO5	Make use of Heuristics in The Use of Heuristics in Object-Oriented Design		

Subject:	Big Data Analytics Laboratory		
Subject Code:	22SCSL26	NBA Code:	22PSCS112
CO1	Gain proficiency in adding files and directories, retrieving files, and deleting files within the Hadoop Distributed File System (HDFS) using command line utilities.		
CO2	Execute a basic word count MapReduce program to comprehend the fundamental concepts of the MapReduce paradigm, including mapping, shuffling, and reducing tasks.		
CO3	Develop and execute a MapReduce program to mine and analyze weather data collected from global sensors, leveraging Hadoop's scalability for handling large semi-structured datasets.		
CO4	Implement matrix multiplication using the MapReduce framework in Hadoop, demonstrating the distributed computing capabilities for complex data processing tasks.		
CO5	Execute Pig Latin scripts to perform word count and other data processing tasks, showcasing the capabilities of Pig for data transformation and analysis in Hadoop ecosystems.		

COURSE OUTCOMES - 2022 SCHEME (PG)

3rd SEMESTER

Subject:	**Cloud Computing**		
Subject Code:	**22SCS31**	**NBA Code:**	**22PSCS201**
CO1	Understand cloud computing concepts, delivery models, services, and major providers		
CO2	Analyze cloud computing challenges, architectural styles, and application workflows with real-world case studies.		
CO3	Explore virtualization techniques, virtual machine monitors (VMMs), and performance/security aspects in cloud environments		
CO4	Learn resource management policies, task scheduling strategies, and optimization techniques for cloud-based applications.		
CO5	Identify cloud security risks, privacy concerns, and best practices for securing and developing cloud applications		

Subject:	**Business Intelligence and its Applications**		
Subject Code:	**22SCS325**	**NBA Code:**	**22PSCS202**
CO1	Understand the steps and structures involved in starting a BI project, including team setup, business justification, and risk assessment.		
CO2	Develop skills in managing and planning BI projects, defining requirements, and conducting interviews for project specifics		
CO3	Apply logical and physical database design techniques for BI applications, focusing on security management and recovery		
CO4	Manage BI application growth and releases, conduct post-implementation reviews, and evaluate information assets		
CO5	Gain insights into business-driven IT applications, enterprise reporting, and the strategic role of BI in achieving business goals.6		

Subject:	**Blockchain Technology**		
Subject Code:	**22SCS335**	**NBA Code:**	**22PSCS203**
CO1	Understand blockchain basics, including types, history, and benefits.		
CO2	Explain decentralization methods using blockchain and describe cryptographic concepts like asymmetric cryptography and key management		
CO3	Analyze Bitcoin transactions and the role of blockchain in facilitating payments and explore alternative cryptocurrencies (Altcoins) like Namecoin, Litecoin, Primecoin, and Zcash, including their theoretical foundations		
CO4	Define smart contracts and their significance in blockchain applications and introduce Ethereum blockchain, its architecture, and precompiled contracts.		
CO5	Explore diverse applications of blockchain technology beyond cryptocurrencies, including IoT, government services, healthcare, and finance		

Subject:	**Project Work Phase – 1**		
Subject Code:	**22SCS34**	**NBA Code:**	**22PSCS204**
CO1	Demonstrate a sound technical knowledge of their selected project topic.		
CO2	Undertake problem identification, formulation, and solution		
CO3	Communicate with engineers and the community at large in written an oral forms		
CO4	Demonstrate the knowledge, skills and attitudes of a professional engineer		

Subject:	**Societal Project**		
Subject Code:	**22SCS35**	**NBA Code:**	**22PSCS205**
CO1	Building solution for real life societal problems		
CO2	Improvement of their technical/curriculum skills		

Subject:	**Internship / Professional Practice**		
Subject Code:	**22SCSI36**	**NBA Code:**	**22PSCS206**
CO1	Gain practical experience within industry in which the internship is done and acquire knowledge of the industry in which the internship is done		
CO2	Apply knowledge and skills learned to classroom work and demonstrate the knowledge, skills and attitudes of a professional engineer		
CO3	Develop a greater understanding about career options while more clearly defining personal career goals and experience the activities and functions of professionals.		
CO4	Develop and refine oral and written communication skills and Identify areas for future knowledge and skill development		
CO5	Expand intellectual capacity, credibility, judgment, intuition and acquire the knowledge of administration, marketing, finance and economics		

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4th SEMESTER

Subject:	**Project Work Phase -2**		
Subject Code:	**22SCS41**	**NBA Code:**	**22PSCS207**
CO1	Present the project and be able to defend it and make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.		
CO2	Habituated to critical thinking and use problem solving skills		
CO3	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms		
CO4	Work in a team to achieve common goal		
CO5	Learn on their own, reflect on their learning and take appropriate actions to improve it		