



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

Kakinada-533003, Andhra Pradesh, India

M.Tech in Information Technology

Advanced Data Structures and Algorithms

Code: R19MIT1151

CO	Course Outcomes	Knowledge Level (K)#
CO1	Ability to write and analyze algorithms for algorithm correctness and efficiency	K4
CO2	Master a variety of advanced abstract data type (ADT) and data structures and their Implementation.	K3
CO3	Demonstrate various searching, sorting and hash techniques and be able to apply and solve problems of real life	K2
CO4	Design and implement variety of data structures including linked lists, binary trees, heaps, graphs and search trees	K6
CO5	Ability to compare various search trees and find solutions for IT related problems	K5

Full Stack Technologies

Code: R19MIT1152

CO	Course Outcomes	Knowledge Level (K)#
CO1	Identify the Basic Concepts of Web & Markup Languages	K3
CO2	Develop web Applications using Scripting Languages & Frameworks	K3
CO3	Creating & Running Back-end scripts & Connecting to Databases	K6
CO4	Demonstrate Database Queries & DBMS and Working with JQuery Framework	K2
CO5	Adapt to Deployment Techniques & Working with cloud	K6



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Advanced Graph Theory

Code: R19MIT1153

CO	Course Outcomes	Knowledge Level (K)#
CO1	Demonstrate basic concepts in graph theory: coloring, planar graphs.	K2
CO2	Evaluate precise and accurate mathematical definitions of objects in graph theory.	K5
CO3	Determine and solve some real time problems using concepts of graph theory (e.g., scheduling problems).	K5
CO4	Build some classical graph algorithms in order to find sub graphs with desirable properties.	K3
CO6	Compile and deduce properties of chromatic numbers and polynomials and identify certain problems as graph colouring problems.	K6

Machine Learning with Python

Code: R19MIT1153

CO	Course Outcomes	Knowledge Level (K)#
CO1	Examine features that can be used for a particular machine learning approach in various IOT applications.	K4
CO2	To compare and contrast pros and cons of various machine learning techniques and to get an insight of when to apply a particular machine learning approach.	K2
CO3	To mathematically analyze various machine learning approaches and paradigms.	K4
CO4	Demonstrate Deep Learning concepts and Feature Representation Learning	K2
CO5	Organize Scalable Machine Learning and classification methods for IOT	K3



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Big Data Analytics

Code: R19MIT1153

CO	Course Outcomes	Knowledge Level (K)#
CO1	Demonstrate the programming requirements viz., generic types and methods to perform data analysis.	K3
CO2	Organize the existing technologies and the need of distributed files systems to analyze the big data	K3
CO3	To demonstrate and analyze Map-Reduce programming model for better optimization.	K4
CO4	Collect, manage, store, query, and analyze big data; and identify the suitable functions / interfaces to perform I/O operations in Hadoop.	K4
CO5	Identify the need based tools, viz., Pig and Hive and to handle and formulate an effective strategy to implement a successful Data analytics project	K6

Data Mining & Knowledge Discovery

Code: R19MIT1154

CO	Course Outcomes	Knowledge Level (K)#
CO1	Compare types of data, quality of data, suitable measures required to perform data analysis.	K2
CO2	Choose appropriate classification technique to perform classification, model building and evaluation.	K3
CO3	Make use of association rule mining techniques on categorical and continuous data.	K3
CO4	Identify and apply clustering algorithm (with open source tools), interpret, evaluate and report the result.	K3
CO5	Analyze and Compare anomaly detection techniques.	K4



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Cryptography & Network Security

Code: R19MIT1154

CO	Course Outcomes	Knowledge Level (K)#
CO1	Explain different security threats and countermeasures and foundation course of cryptography mathematics.	K2
CO2	Classify the basic principles of symmetric key algorithms and operations of some symmetric key algorithms and asymmetric key cryptography	K4
CO3	Revise the basic principles of Public key algorithms and Working operations of some Asymmetric key algorithms such as RSA, ECC and some more	K6
CO4	Design applications of hash algorithms, digital signatures and key management techniques	K6
CO5	Determine the knowledge of Application layer, Transport layer and Network layer security Protocols such as PGP, S/MIME, SSL,TSL, and IPsec .	K5

Object Oriented Software Engineering

Code: R19MIT1154

CO	Course Outcomes	Knowledge Level (K)#
CO1	Apply the Object Oriented Software-Development Process to design software	K3
CO2	Analyze and Specify software requirements through a SRS documents.	K4
CO3	Design and Plan software solutions to problems using an object-oriented strategy.	K6
CO4	Model the object oriented software systems using Unified Modeling Language (UML)	K3
CO5	Estimate the cost of constructing object oriented software.	K6



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Research Methodology and IPR

Code: R19MIT1155

CO	Course Outcomes	Knowledge Level (K)#
CO1	Understand research problem formulation.	K3
CO2	Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.	K4
CO3	Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.	K3
CO4	Analyze research related information	K6
CO5	Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.	K3

Advanced Data Structures and Algorithms Lab

Code: R19MIT1156

CO	Course Outcomes	Knowledge Level (K)#
CO1	Identify classes, objects, members of a class and relationships among them needed for a specific problem.	K2
CO2	Examine algorithms performance using Prior analysis and asymptotic notations.	K4
CO3	Organize and apply to solve the complex problems using advanced data structures (like arrays, stacks, queues, linked lists, graphs and trees.)	K3
CO4	Apply and analyze functions of Dictionary	K3



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Full Stack Technologies Lab

Code: R19MIT1157

CO	Course Outcomes	Knowledge Level (K)#
CO1	Understand, analyze and apply the role of languages like HTML, CSS, XML.	K3
CO2	Review JavaScript, PHP and protocols in the workings of the web and web applications	K2
CO3	Recommend of Web Application Terminologies, Internet Tools, E – Commerce and other web services.	K5
CO4	Develop and Analyze dynamic Web Applications using PHP, MySql, Node & MongoDB	K6
CO5	Installing & Using Frameworks.	K6

English for Research Paper Writing

Code: R19MIT1158

CO	Course Outcomes	Knowledge Level (K)#
CO1	Understand that how to improve your writing skills and level of readability	K2
CO2	Learn about what to write in each section	K3
CO3	Understand the skills needed when writing a Title	K5



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Disaster Management

Code: R19MIT1158

CO	Course Outcomes	Knowledge Level (K)#
CO1	Learn to demonstrate a critical understanding of key concepts in disaster risk reduction and humanitarian response.	K2
CO2	Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.	K3
CO3	Develop an understanding of standards of humanitarian response and practical relevance in specific types of disasters and conflict situations.	K5
CO4	Critically understand the strengths and weaknesses of disaster management approaches, planning and programming in different countries, particularly their home country or the countries they work.	K3

Sanskrit for Technical Knowledge

Code: R19MIT1158

CO	Course Outcomes	Knowledge Level (K)#
CO1	To get a working knowledge in illustrious Sanskrit, the scientific language in the world	K2
CO2	Learning of Sanskrit to improve brain functioning	K3
CO3	Learning of Sanskrit to develop the logic in mathematics, science & other subjects	K5
CO4	The engineering scholars equipped with Sanskrit will be able to explore the huge knowledge from ancient literature	K3

Value Education

Code: R19MIT1158

CO	Course Outcomes	Knowledge Level (K)#
CO1	Knowledge of self-development	K2
CO2	Learn the importance of Human values	K3
CO3	Developing the overall personality	K5



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Data Science

Code: R19MIT1251

CO	Course Outcomes	Knowledge Level (K)#
CO1	Acquire the knowledge and expertise to become a proficient data scientist	K3
CO2	Demonstrate an understanding of statistics and machine learning concepts that are vital for data science	K3
CO3	Explain how data is collected, managed and stored for data science	K2
CO4	Interpret the key concepts in data science, including their real-world applications and the toolkit used by data scientists	K2
CO5	Illustrate data collection and management scripts using MongoDB	K3

Advanced Network Protocols

Code: R19MIT1252

CO	Course Outcomes	Knowledge Level (K)#
CO1	Outline different layers of TCP/IP protocol stack	K2
CO2	Analyze the working principle of different protocols at different layers	K4
CO3	Adapt the concepts of networking protocols	K6
CO4	Evaluate the issues based on the Transport Layer Protocols	K5
CO5	Demonstrate the Application Layer Protocols	K2



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High Performance Computing

Code: R19MIT1253

CO	Course Outcomes	Knowledge Level (K)#
CO1	Design, formulate, solve and implement high performance versions of standard single threaded algorithms.	K6
CO2	Demonstrate the architectural features in the GPU and MIC hardware accelerators.	K2
CO3	Design programs to extract maximum performance in a multicore, shared memory execution environment processor.	K6
CO4	Analyze Symmetric and Distributed architectures.	K4
CO5	Develop and deploy large scale parallel programs on tightly coupled parallel systems using the message passing paradigm.	K6

Adhoc& Sensor Networks

Code: R19MIT1253

CO	Course Outcomes	Knowledge Level (K)#
CO1	Evaluate the principles and characteristics of mobile ad hoc networks (MANETs) and what distinguishes them from infrastructure-based networks.	K5
CO2	Determine the principles and characteristics of wireless sensor networks.	K5
CO3	Discuss the challenges in designing MAC, routing and transport protocols for wireless ad-hoc sensor networks.	K6
CO4	Illustrate the various sensor network Platforms, tools and applications.	K4
CO5	Demonstrate the issues and challenges in security provisioning and also familiar with the mechanisms for implementing security and trust mechanisms in MANETs and WSNs.	K2



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Web Analytics and Development

Code: R19MIT1253

CO	Course Outcomes	Knowledge Level (K)#
CO1	Become familiar with core research communities, publications, focused on web and social media analytics and research questions engaged in.	K4
CO2	To recognise the role of web analytics within the digital marketing landscape.	K2
CO3	Evaluate different types of software tools, techniques, and reports that are relevant to web analytics and understand the basics of how to apply them;	K2
CO4	Explain concepts clearly and critically apply findings.	K6
CO5	Plan the resources needed to capture, process and analyse data, and to evaluate and disseminate the outcomes.	K3

Cloud Computing

Code: R19MIT1254

CO	Course Outcomes	Knowledge Level (K)#
CO1	Analyze the Cloud computing setup with it's vulnerabilities and applications using different architectures.	K2
CO2	Design different workflows according to requirements and apply map reduce programming model.	K6
CO3	Apply and design suitable Virtualization concept, Cloud Resource Management and design scheduling algorithms.	K4
CO4	Create combinatorial auctions for cloud resources and design scheduling algorithms for computing clouds	K6
CO5	Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application	K5



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Internet of Things

Code: R19MIT1254

CO	Course Outcomes	Knowledge Level (K)#
CO1	Review Internet of Things (IoT).	K2
CO2	Demonstrate various business models relevant to IoT.	K3
CO3	Construct designs for web connectivity	K6
CO4	Organize sources of data acquisition related to IoT, integrate to enterprise systems.	K4
CO5	Describe IoT with Cloud technologies.	K2

GPU Computing

Code: R19MIT1254

CO	Course Outcomes	Knowledge Level (K)#
CO1	Students would learn concepts in parallel programming.	K2
CO2	Implementation of programs on GPUs.	K3
CO3	Debugging and profiling parallel programs.	K6
CO4	Understand the role of visual effects in games and their connection to player experience.	K4
CO5	Understand how to use a GPU as a general processing device.	K2

Data Science Lab

Code: R19MIT1255

CO	Course Outcomes	Knowledge Level (K)#
CO1	Use Deep Learning techniques to build concise representations of the meanings of words in all significant languages.	K3
CO2	Use machine learning methods to solve the real-world problems.	K3
CO3	Develop a Back propagation algorithm	K6
CO4	Experiment with AI and data visualization techniques.	K3
CO5	Examine decision tree based Id3, Naive Bayes and K-Means Clustering.	K4



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Advanced Network Protocols Lab

Code: R19MIT1256

CO	Course Outcomes	Knowledge Level (K)#
CO1	Demonstrate data link layer functionalities.	K3
CO2	Develop the client server application using socket programming.	K6
CO3	Choose routing protocols to solve real world problems.	K5
CO4	Evaluate FTP, DNS/ HTTP of application layer functionalities.	K5

Constitution of India

Code: R19MIT1258

CO	Course Outcomes	Knowledge Level (K)#
CO1	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.	K6
CO2	Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.	K6
CO3	Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution.	K6
CO4	Discuss the passage of the Hindu Code Bill of 1956.	K6
CO5	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.	K6



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Pedagogy Studies

Code: R19MIT1258

CO	Course Outcomes	Knowledge Level (K)#
CO1	What pedagogical practices are being used by teachers in formal and informal classrooms in developing countries?	K1
CO2	What is the evidence on the effectiveness of these pedagogical practices, in what conditions, and with what population of learners?	K1
CO3	How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?	K1

Stress Management by Yoga

Code: R19MIT1258

CO	Course Outcomes	Knowledge Level (K)#
CO1	Develop healthy mind in a healthy body thus improving social health also	K4
CO2	Improve efficiency	K2
CO3	achieve overall health of body and min	K3
CO4	overcome stress and to maintain peace of mind	K5

Personality Development through Life Enlightenment Skills

Code: R19MIT1258

CO	Course Outcomes	Knowledge Level (K)#
CO1	Study of Shrimad-Bhagwad-Geeta will help the student in developing his personality and achieve the highest goal in life	K2
CO2	The person who has studied Geeta will lead the nation and mankind to peace and prosperity	K3
CO3	Study of Neetishatakam will help in developing versatile personality of students.	K5



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Web of Things

Code: R19MIT2351

CO	Course Outcomes	Knowledge Level (K)#
CO1	Demonstrate functional Requirements Middleware for IoT.	K2
CO2	Develop IOT Protocols for M2M and WSN.	K6
CO3	Compare and contrast Web of Things versus Internet of Things.	K3
CO4	Examine Business Models for the Internet of Things.	K4
CO5	Perform Storing and Retrieving data for Application Development.	K3

Deep Learning

Code: R19MIT2351

CO	Course Outcomes	Knowledge Level (K)#
CO1	Identify the deep learning algorithms which are more appropriate for various types of learning tasks in various domains.	K2
CO2	Compute deep learning algorithms and solve real-world problems.	K3
CO3	Develop algorithms simulating human brain.	K6
CO4	Apply Neural Networks for problem solving.	K3
CO5	Examine the essentials of Deep Learning and Deep Network architectures.	K4
CO6	Define, train and use a Deep Neural Network for solving real world problems that require artificial Intelligence based solutions.	K3



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Python Programming

	Course Outcomes	Knowledge Level (K)#
CO1	Understand and comprehend the basics of python programming.	K2
CO2	Demonstrate the principles of structured programming and be able to describe, design, implement, and test structured programs using currently accepted methodology.	K3
CO3	Explain the use of the built-in data structures list, sets, tuples and dictionary.	K3
CO4	Make use of functions and its applications.	K3
CO5	Identify real-world applications using oops, files and exception handling provided by python.	K3

Principles of Cyber Security

	Course Outcomes	Knowledge Level (K)#
CO1	Apply cyber security architecture principles.	K3
CO2	Describe risk management processes and practices.	K2
CO3	Appraise cyber security incidents to apply appropriate response	K5
CO4	Distinguish system and application security threats and vulnerabilities.	K4
CO5	Identify security tools and hardening techniques	K3



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Internet of Things

Course Outcomes		Knowledge Level (K)#
CO1	Explain the definition and usage of the term 'the internet of things' in different contexts	K4
CO2	Discover the various network protocols used in IoT	K3
CO3	Be familiar with the key wireless technologies used in IoT systems, such as Wi-Fi, 6LoWPAN, Bluetooth and ZigBee	K4
CO4	Define the role of big data, cloud computing and data analytics in a typical IoT system.	K6
CO5	Design a simple IoT system made up of sensors, wireless network connection, data analytics and display/actuators, and write the necessary control software	K3

Artificial Intelligence and Machine Learning

Course Outcomes		Knowledge Level (K)#
CO1	Explain the fundamentals of AI and machine learning.	K2
CO2	Identify an appropriate AI problem solving method and knowledge representation technique.	K3
CO3	Identify appropriate machine learning models for problem solving.	K3
CO4	Design and develop the AI applications in real world scenario.	K6
CO5	Differentiate relationship between AI, ML, and Deep Learning,	K5