MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE

(UGC-AUTONOMOUS INSTITUTION)
Affiliated to JNTUA, Ananthapuramu & Approved by AICTE, New Delhi
NAAC Accredited with A+ Grade, NIRF India Rankings 2022 - Band: 251-300 (Engg.)
NBA Accredited - B.Tech. (CIVIL, CSE, ECE, EEE, MECH), MBA & MCA

Department of CSE-Data Science

STATE OF ART LABORATORY WITH THE FOLLOWING SPECIFICATION

Processor (CPU):	12TH GEN INTEL(R) CORE(TM) i7 – 1200F 2.10 GHz
Operating System:	Microsoft Windows 10 Professional x64 (free via Azure Dev Tools for Teaching. Restrictions apply.)
Memory:	32.0 GB (31.9 USABLE)
Storage:	512 GB internal Solid State Drive (SSD) or 2.5 TB internal HDD
Sustainability	EPEAT Silver rating (preferably EPEAT Gold)
Monitor/Display:	24" LCD monitor
Network Adaptor:	802.11ac 2.4/5 GHz wireless adapter

Program specific Labs in Curriculum

Year	Semester	Lab Course	Lab Softwares	Course objectives
I	I	Programming for Problem Solving (Python)	Python IDLE, Geany, Raptor (All are Open Source)	1. Learn Python programming constructs. 2. Implement Python programs with conditional structures and loops. 3. Use functions for structuring Python programs. 4. Handle compound data using Python lists, tuples, and dictionaries. 5. Manipulate data using files handling in Python. 6. Getting exposed to the basics of Object Oriented Programming using Python
	II	C Programming and Data Structures Laboratory	Geany (Open Source)	1. To make the student understand fundamentals of C programming language and problem solving. 2. To get hands-on practices with the syntax and semantics of C programming language. 3. To develop algorithms for sorting, searching techniques. 4. To design and implement operations on stacks, queues, and linked lists.
II	I	Data Structures using Python Laboratory	Python IDLE, Geany, any other Online Software's (All are Open Source)	1. To develop skills to design and analyze linear and nonlinear data structures. 2. To develop algorithms for manipulating linked lists, stacks, queues, trees and graphs.

				3. To develop recursive algorithms as they apply to trees and graphs. 4. To develop skill in advanced linked list. 5. To develop skill in advanced sorting.
		Object Oriented Programming - JAVA Laboratory	JDK, Netbeans, Eclipse, Geany	1. Understand object-oriented programming concepts, and apply them in solving problems. 2. Learn the principles of inheritance and polymorphism; and demonstrate how they relate to the design of abstract classes 3. To Introduce the implementation of packages and interfaces 4. Learn the concepts of exception handling and multithreading. 5. Learn the design of Graphical User Interface using applets and swing controls.
		Fundamentals of Artificial Intelligence Laboratory	Python IDLE, Pycharm, Jupiter (Open Source)	1. To train the students in solving computational problems 2. To elucidate solving mathematical problems using Python programming language 3. To understand the fundamentals of Python programming concepts and its applications. 4. Practical understanding of building different types of models and their evaluation
		Android Application Development (SOC)	Android Studio latest Version	1. Understand Android history and its fundamentals and know

				the building blocks of android 2. Get idea on the creation of android user interface and its testing mechanisms 3. Identify the usage of threads, broadcast receivers, indents, services and their working methodology 4. Know about the storage mechanism in android using SQLite and the usage of content providers 5.Recognize the usage of android widgets and sensors in android based applications
	II	Operating Systems Fundamentals Laboratory	Telnet in Ubuntu	1. To learn the mechanisms of OS to handle processes and threads and their communication 2. To learn the mechanisms involved in memory management in contemporary OS 3. To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols 4. To know the components and management aspects of concurrency management
		Python for Data Science	Jupyter, Google Colab	1. To train the students in solving computational problems

				2. To elucidate solving mathematical problems using Python programming language 3. To understand the fundamentals of Python programming concepts and its applications. 4. Practical understanding of building different types of models and their evaluation
		Design and Analysis of Algorithms Laboratory	Geany	1. To learn how to analyse a problem & design the solution for the problem. 2. To Strengthen the ability to identify and apply the suitable algorithm for the given real world problem. 3. To develop the optimal solution, i.e., time complexity & space complexity must be very low
III	I	Data Visualization Laboratory	Tableau, Power Bi.	1. To explore the various data visualization tools. 2. To understand the various libraries in python for data visualization. 3. To practice drawing various representations such as charts and graphs using Power Bi and Tableau. 4. To understand matplot, geoplot to visualize the data. 5. To explore gnuplot and tensorflow for data visualization.
		Machine Learning Laboratory	JupyterNB, Google Colab	1. Make use of Data sets in implementing the machine learning algorithms

				2. Implement the machine learning concepts and algorithms in any suitable language of choice 3. To apply various supervised learning methods to different problems. 4. To evaluate the performance of the machine learning algorithms. 5. To skill in various languages to analyse the machine learning algorithms.
		R Programming for Data Science	R Studio	1. Provide a solid understanding of R programming language and its syntax. 2. Manipulate and analyze data using R. 3. Introduce basic statistical operations and their implementation in R. 4. Enable students to create meaningful data visualizations using R. 5. Introduce data import/export techniques for seamless data handling. 6. Provide an introduction to machine learning concepts and decision trees in R.
	II	Big Data Analytics Laboratory	VM ware, Ubuntu OS, Hadoop, MongoDB, JDK 8	1. Optimize business decisions and create competitive advantage with Big Data analytics 2. Imparting the architectural concepts of Hadoop and introducing map reduce paradigm

				3. Introducing Java concepts required for developing map reduce programs 4. Derive business benefit from unstructured data 5. Introduce programming tools PIG & HIVE in Hadoop echo system. 6. Developing Big Data applications for streaming data using Apache Spark
		Deep Learning Laboratory	Anagonda Navigator, Jupiter, Google Colab	1. Understand the working principle of perceptron model. 2. Learn different activation functions and optimization techniques used in neural networks. 3. Know the applications of deep learning models for binary and multiclass classification. 4. Understand the architectures of CNN, RNN, LSTM and GRU. 5. Explore various types of Categorical Data Encoding Schemes
		Computer Networks Laboratory	Ubuntu, Python IDLE, Turbo C, NS2, Wireshark.	1. To provide students with a theoretical and practical base in computer networks issues 2. Student will be able purse his study in advanced networking course
		Full Stack Development	MongoDB, XAMPP, Online Compliers.	1. Build web applications using HTML, JavaScript, CSS, and PHP with client-side validations. 2. Create and integrate Plug-ins with jQuery (Events, Animation).

				3. Build XML documents with DTD, Schemas, and style sheets. 4. Develop a web application with database interaction using Node JavaScript and Angular JavaScript 5. Implement MongoDBModels.