

Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)

Syllabus for B. Tech in CSE (Artificial Intelligence & Machine Learning)

(Applicable from the academic session 2020-2021)

IT Workshop (Sci Lab/MATLAB/Python/R)

Code: PCC CS(AIML)393

Contacts: 4P

Name of the Course:	IT Workshop (Sci Lab/MATLAB/Python/R)
Course Code: PCC-CS393	Semester: III
Duration: 6 months	Maximum Marks: 100
Teaching Scheme:	
Theory: NIL	Continuous Internal Assessment
Tutorial: NIL	External Assessment: 60
Practical: 4 hrs./week	Distribution of marks: 40
Credit Points:	2

Practical Syllabus

Programming in R

1. Introduction to mechanism for statistics, data analysis, and machine learning; Introduction of R Programming, How to install and run R, Use of R help files, R Sessions, R Objects – Vectors, Attributes, Matrices, Array, Class, List, Data Frames etc. Operators in R.
2. R Programming Structures, Control Statements, Loops, Repeat and Break, R-Function, RVector Function, Recursive Function in R.
3. R Packages (Install and Use), Input/Output Features in R, Reading or Writing in File. Data Manipulation in R. Rearranging data, Random Number and Simulation, Statistical methods like min, max, median, mean, length, Linear Regression, Normal Distribution, Decision tree
4. Graphics, Creating Graphs, The Workhorse of R Base Graphics, Graphical Functions – Customizing Graphs, Saving Graphs to Files, Pie chart, Bar Chart, Histogram.

Programming in

Matlab Introduction

Why MATLAB?, History, Its strengths, Competitors, Starting MATLAB, Using MATLAB as a calculator, Quitting MATLAB

Basics

Familiar with MATLAB windows, Basic Operations, MATLAB-Data types, Rules about variable names, Predefined variables

Programming-I

Vector, Matrix, Array Addressing, Built-in functions, Mathematical Operations, Dealing with strings (Array of characters), Array of array (cell) concept

Programming-II

Script file, Input commands, Output commands, Structure of function file, Inline functions, Feval command, Comparison between script file and function file

Conditional statements and Loop

Relational and Logical Operators, If-else statements, Switch-case statements, Forloop, While loop, Special commands (Break and continue), Import data from large database, Export data to own file or database

2D Plotting

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In-built functions for plotting, Multiple plotting with special graphics, Curve fitting, Interpolation, Basic fitting interface

3D Plotting

Use of meshgrid function, Mesh plot, Surface plot, Plots with special graphics Programming with Python

Introduction

History, Features, Setting up path, Working with Python, Basic Syntax, Variable and Data Types, Operator

Conditional Statements

If, If- else, Nested if-else, Looping, For, While, Nested

loops Control Statements

Break, Continue,

Pass String

Manipulation

Accessing Strings, Basic Operations, String slices, Function and

Methods Lists

Introduction, Accessing list, Operations, Working with lists, Function and

Methods Tuple

Introduction, Accessing tuples, Operations, Working, Functions and

Methods Dictionaries

Introduction, Accessing values in dictionaries, Working with dictionaries,

Properties Functions

Defining a function, Calling a function, Types of functions, Function

Arguments, Anonymous functions, Global and local variables

Modules

Importing module, Math module, Random module, Packages, Composition, Input-

Output Printing on screen, Reading data from keyboard, Opening and closing file,

Reading and writing files, Functions

Exception Handling

Exception, Exception Handling, Except clause, Try? finally clause, User Defined Exceptions.