

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Mechanical Engineering, VII-Semester

ME- 705 MATLAB and R Programming

The purpose of this laboratory is to provide the knowledge of latest research tools/techniques such as MATLAB and R Programming which is being used in finding out the solution of most of the engineering problems. **MATLAB** is a multi-paradigm numerical computing environment and proprietary programming language developed by MathWorks. MATLAB allows matrix manipulations, plotting of functions and data, implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages.

Following are the suggested list of experiments related to MATLAB (Pl expand)

1. Introduction to MATLAB
2. Working with matrices
3. Rational and logical operation of MATLAB
4. Creating a plot using Plot function
5. Complex and stastical functions (e.g.: Produce ten elements vector of random complex numbers and find the summation of this vector)
6. Numbers and strings (1. Write a program in M-File to read 3 x 3 Matrix, then display the diagonal of matrix as shown below: The Diagonal of This Matrix = []
2. Write a program to read a string, then replace each character in the string with its following character in ASCII code*.)

R Programming is a programming language and free software environment for statistical computing and graphics supported by the R Foundation for Statistical Computing. The R language is widely used among statisticians and data miners for developing statistical software and data analysis.

In this lab, students are supposed to learn how to program in R and how to use R for effective data analysis. Students need to learn how to install and configure software necessary for a statistical programming environment and describe generic programming language concepts as they are implemented in a high-level statistical language.

The lab should cover practical issues in statistical computing which includes programming in R, reading data into R, accessing R packages, writing R functions, debugging, profiling R code, and organizing and commenting R code.

Following are the suggested tutorials to be covered:

1. What is R Programming Language?
2. How to Download & Install R, RStudio, Anaconda on Mac or Windows
3. Weite R Data Types, Arithmetic & Logical Operators with Example
4. Write about R Matrix : Create, Print, add Column, Slice
5. Explain Factor in R: Categorical & Continuous Variables
6. Explain about R Data Frame: Create, Append, Select, Subset.

Evaluation:

Evaluation will be continuous and integral part of the class as well as through external assessment (Viva/voce)