St Berchmans College
Founded 1922
AUTONOMOUS | College with Potential for Excellence | Reaccredited by NAAC with A Grade

(Add-on Course, Department of Physics)

Introduction to MATLAB

Course Description and Objectives

This course will introduce students to computer programming and problem solving using Matlab. It is an introductory course for students aimed at developing their skill in scientific computing. Matlab is a language designed especially for processing, evaluating and graphical displaying of numerical data. The class is lab-focused, so students will spend much more time doing hands-on exercises in computer lab. There are no maths or programming prerequisites; however elementary skills in computer science will be an advantage.

By the end of the course students are expected to: • write simple computer programs in Matlab • Apply the skills to evaluate scientific problems • Understand basic concepts in computer science • Learn data structures (such as strings, matrices and arrays), data manipulation and presentation (loading data files, computing simple statistics and graphing data), and basic programming techniques.

Course Syllabus | 2022

Introduction to MATLAB

Total Number of Hours: 36
Total Number of Credits: 2

Unit I (18 hrs)

Introduction to MATLAB; Basics of MATLAB: windows - input & output - platform dependence - file types - general commands

Script Files; Function files: Functions – Sub functions; Global Variables, Loops, Branches and control-flow

Tutorials: Basics - Creating and working with arrays - Creating and Printing simple plots - Creating, saving and executing a script - Creating and executing a function file - Working with arrays and matrices - Importing and Exporting data - Files and Directories - Publishing reports

Unit II (18 hrs)

Graphics; Plotting simple graphs; Basic 2D plots: Style Options – Labels, title and legend – Axis Control, zoom in and zoom out – Using plot editor - Overlay plots – Specialized 2D Plots; Examples: fplot – semilogx – semilogy – loglog – fill – bar – barh – area – pie – hist – stem – stairs – compass – comet – pcolor; subplots

3D plots; View: view(2) and view(3) with examples; Mesh and surface plots; Examples: plot3 – fill3 – surf – surfc -surf1 – meshz – waterfall – pie3 – stem3

References

1. Getting started with MATLAB- Rudra Pratap, Oxford University Press.
2. Mastering MATLAB 7- Duane Hanselma and Bruce Littlefield, Pearson Education.
3. Understanding MATLAB- S N Alam, I K International Publishing House.
4. Programming in MATLAB- Patel and Mittal, Pearson Education India
5. Web resource: www.mathworks.com

Evaluation

The evaluation of each course shall be done internally and contain two parts.

i Continuous evaluation

ii Written examination

Both continuous evaluation and written examination shall be carried out using indirect grading. There shall be a maximum of twenty (20) marks for continuous evaluation and eighty (80) marks for written + lab examination.

Continuous evaluation

The components of the continuous evaluation and their marks are as below.

Components of Continuous Evaluation	**Marks**
Attendance	10
Assignment	10
Total	**20**

Marks for attendance

% of Attendance	**Marks**
90 and above	10
85 - 89	8
80 - 84	6
76 - 79	4
75	2

(Decimals shall be rounded off to the next higher whole number)

Written examination

The written examination in theory and practical courses shall be conducted by the College/Department.

Question Pattern for Written Examination -Mark Distribution			**Marks**
Part A	5/5	5x 2	10
Part B	4/6	4x 5	20
Part C	2/4	2x 10	20
Total			**50**

The division of lab/practical marks (30 marks) will be decided by the Chairman of the examination.

For all courses (theory and practical) an indirect grading system based on a ten (10) point scale according to the percentage of marks (continuous evaluation and written examination taken together) is used to evaluate the performance of the student in that course. The percentage shall be rounded mathematically to the nearest whole number.

Percentage of Marks	**Grade**	**Performance**
90 and above	A+	Outstanding
80 - 89	A	Excellent
70 - 79	B	Very Good
60 - 69	C	Good
50 - 59	D	Satisfactory
40 - 49	E	Adequate
Below 40	F	Failure

4. ATTENDANCE

4.1. The minimum requirement of aggregate attendance for appearing the written examination shall be 75%.