

**CERTIFICATE COURSE IN LATEX AND
MATLAB**



SADAKATHULLAH APPA COLLEGE (AUTONOMOUS)

Rahmath Nagar, Tirunelveli -627 011

Certificate Course on

LaTeX and MATLAB for UG Courses

Offered by the

Department of Mathematics (Unaided)

About the Course

The course is designed to develop the knowledge on analyzing both the LaTeX and MATLAB Software

Instructional Design

This course is of twelve months duration which includes Theory classes and Practical sessions, Assignment and Project Work.

Eligibility

All students who have passed Higher Secondary are eligible to enroll for the course.

Scope of the course

The course provides enriching and rewarding career for the students. Job opportunities in various fields like typesetting. To prepare the typeset document using the LaTeX software with aesthetics. To effortlessly convert the files into PDF, HTML etc. To visualize the given data using the MATLAB Software. To understand the matrix based language allowing most numerical computations with the MATLAB Software.

CERTIFICATE COURSE IN LATEX AND MATLAB			
PAPER I	LATEX	18NMAC11	
Total Hrs:45	Hrs/week:2	Hrs./ UNIT : 9	Credit: 3

OBJECTIVES

- To learn the latest techniques in Latex for the preparation of printable document in an enhanced manner.
- To avoid difficulty while typing project or thesis comparing other mathematical software.

UNIT – I

Introduction - Basics of Latex file - **Text, Symbols and Commands:** Command names and arguments – Environments – Declarations – Lengths – Special characters – Fragile commands – Exercises.

UNIT – II

Document Layout and Organization: Document class – Page style – Parts of the document – Table of contents

UNIT – III

Displayed Text: Changing font – Centering and indenting – Lists – Generalized lists - Printing literal text – **Text in Boxes:** Boxes - Footnotes and marginal notes.

UNIT – IV

Tables: Tubular stops – Tables – **Mathematical Formulas:** Mathematical Environment – Main elements of math mode – Mathematical Symbols.

UNIT – V

Drawing with Latex: The picture environment – Extended pictures – other drawing packages.

TEXT BOOKS:

1. Guide to LATEX by Helmut Kopka and Patrick W. Daly, Fourth Edition, Addison –Wesley, Pearson Education, 2004.

UNIT I: Chapter 1: Sections: 1.5, 2.1 – 2.6

UNIT II: Chapter 2: Sections: 3.1 – 3.4

UNIT III: Chapter 3: Sections: 4.1 – 4.6, 5.1-5.2

UNIT IV: Chapter 4: Sections: 6.1 – 6.2, 7.1 – 7.3

UNIT V : Chapter 5: Sections: 16.1 –16.3.

CERTIFICATE COURSE IN LATEX AND MATLAB			
PAPER II	MATLAB		18NMAC11
Total Hrs:45	Hrs/week:2	Hrs./ UNIT : 9	Credit: 3

OBJECTIVES

- To solve mathematical equations and to draw graphs using MATLAB.

UNIT - I

Introduction – What is MATLAB – Basics of MATLAB - **Interactive computation:** Matrices and Vectors - Matrix and array operations.

UNIT II

Character strings – A special note on array operation – Command Line Function - Using built in functions and Online help

UNIT III

Saving and Loading data - Plotting simple graphs.

UNIT IV

Applications: Linear Algebra – Curve Fitting and Interpolation – Data Analysis and Statistics

UNIT V

Numerical Integration - Ordinary Differential Equation: A first order linear ODE and A second order non-linear ODE.

TEXT BOOKS:

1. Getting Started with MATLAB – A quick introduction for Scientist and Engineers by Rudra Pratap, Oxford University Press 2003.

UNIT I: Chapter 1: Sections: 1.1, 1.6, 3.1 - 3.2

UNIT II: Chapter 2: Sections: 3.3 – 3.6

UNIT III: Chapter 3: Sections: 3.7 – 3.8

UNIT IV: Chapter 4: Sections: 5.1 – 5.3

UNIT V: Chapter 5: Sections: 5.4 - 5.6

1. Write a LaTeX coding for Basic Mathematical Equation.
2. Write a LaTeX coding for Mathematical Equation with Mathematics Formulae.
3. Write a LaTeX coding for Class Schedule Time Table.
4. Write a LaTeX coding for Nature Scene.
5. Write a LaTeX coding for Rangoli.
6. Write a LaTeX coding for Rainbow.
7. Write a LaTeX coding for Draw a Lotus.
8. Write a LaTeX coding for Construct a Home.
9. Write a LaTeX coding for Chess Board.
10. Write a LaTeX coding for Draw different types of Boxes.

MATLAB PRACTICAL

1. To draw a line using MATLAB coding.
2. To draw a curve using MATLAB coding.
3. To find the addition, subtraction and multiplication of any two matrix using MATLAB coding.
4. To find the determinant, inverse and eigen value of given matrix using MATLAB coding.
5. To find the solution of any differential equation using MATLAB coding.
6. To solve the partial fraction using MATLAB coding.
7. To solve a linear system of three equations using MATLAB coding.
8. How to delete a row and column of a Matrix using MATLAB coding.
9. Create a simple inline function and compute its value using MATLAB coding.
10. To find the roots of the polynomial using MATLAB coding.



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Certificate Course in LATEX and MATLAB

Offered by Department of MATHEMATICS

Upon completion of the Course students will be able to:

- Understand the basics of LATEX like text, symbols and commands.
- Learn the process of defining command line functions.
- Understand how to interpret matrices, vectors using MATLAB software
- Solve the system of equations and find the eigen values, eigen vector for a matrix.
- Analyze the interpretation of boxes, nested boxes and minipages.
- Apply the picture environment to draw graphs and all kinds of images.