COMPUTER LABORATORY II (MATLAB)

Teaching Schedule Per Week			Progressive Assesment		Examination Schedule (Marks)		
Lect	Practical	Tutorials	Test	TW	Theory	Prac.	Total
1	2	-	-	25	-	50	75

DETAILED COURSE CONTENTS:

UNIT 1 Introduction to MATLAB.

1.1 Starting MATLAB, MATLAB Windows.
1.2 Working in the Command Window.
1.3 Arithmetic Operations with Scalars.
1.4 Display Formats.
1.5 Elementary Math Built-In Functions.
1.6 Defining Scalar Variables
1.7 Useful Commands for Managing Variables.
1.8 Script Files.
1.9 Examples of MATLAB Applications.

UNIT 2 Creating Arrays.

2.1 Creating a One-Dimensional Array (Vector).
2.2 Creating a Two-Dimensional Array (Matrix).
2.3 Notes about Variables In MATLAB.
2.4 The Transpose Operator.
2.5 Array Addressing 42
2.6 Using A Colon : In Addressing Arrays.
2.7 Adding Elements to Existing Variables.
2.8 Deleting Elements.
2.9 Built-In Functions for Handling Arrays.
2.10 Strings and Strings As Variables.

UNIT 3 Mathematical Operations with Arrays.

3.1 Addition and Subtraction.
3.2 Array Multiplication.
3.3 ARRAY DIVISION.
3.4 Element-By-Element Operations.
3.5 Using Arrays in MATLAB Built-In Math Functions.
3.6 Built-In Functions for Analyzing Arrays.
3.7 Generation of Random Numbers.

UNIT 4 Using Script Files and Managing Data.

4.1 The MATLAB Workspace and the Workspace Window.
4.2 Input to a Script File.
4.3 Output Commands.
4.4 The Save and Load Commands.
4.5 Importing and Exporting Data

UNIT 5 Two-Dimensional Plots.

5.1 The Plot Command.
5.2 The Fplot Command.
5.3 Plotting Multiple Graphs in the Same Plot.
5.4 Formatting a Plot.
5.5 Plots with Logarithmic Axes.
5.6 Plots with Error Bars.
5.7 Plots with Special Graphics.
5.8 Histograms.
5.9 POLAR PLOTS.
5.10 Putting Multiple Plots on the Same Page.
5.11 Multiple Figure Windows

UNIT 6 Programming In MATLAB.

6.1 Relational and Logical Operators.
6.2 Conditional Statements.
6.3 The Switch-Case Statement.
6.4 Loops.
6.5 Nested Loops And Nested Conditional Statements.
6.6 The Break and Continue Commands.

UNIT 7 User-Defined Functions and Function Files.

7.1 Creating a Function File.
7.2 Structure of a Function File.
7.3 Local and Global Variables.
7.4 Saving a Function File.
7.5 Using a User-Defined Function.
7.6 Examples of Simple User-Defined Functions.
7.7 Comparison between Script Files and Function Files.
7.8 Anonymous and Inline Functions.
7.9 Functions.
7.10 Sub functions.
7.11 Nested Functions.

UNIT 8 Polynomials

8.1 Curve Fitting and Interpolation.
8.2 Polynomials.
8.2 Curve Fitting.
8.3 Interpolation.
8.4 The Basic Fitting Interface.

UNIT 9 Applications in Numerical Analysis.

9.1 Solving an Equation with One Variable.
9.2 Finding a Minimum or A Maximum Of A Function.
9.3 Numerical Integration.
9.4 Ordinary Differential Equations.

UNIT 10 Three-Dimensional Plots.

10.1 Line Plots.
10.2 Mesh and Surface Plots.
10.3 Plots with Special Graphics.
10.4 The View Command.

UNIT 11 Symbolic Math

11.1 Symbolic Objects and Symbolic Expressions.
11.2 Changing the Form of an Existing Symbolic Expression.
11.3 Solving Algebraic Equations.
11.4 Differentiation.
11.5 Integration.
11.6 Solving an Ordinary Differential Equation.
11.7 Plotting Symbolic Expressions.
11.8 Numerical Calculations with Symbolic Expressions.

Lab exercises to be done on each of the above topics

Text Books:

MATLAB An Introduction and applications by -- Amos Gillat