DEPARTMENT OF PHYSICS				*Certificate Course*				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Total Contact Hours**	**CIA**	**Ext**	**Total**
	Certificate course		MATLAB Programming using OCTAVE	2	30	50	50	100

Course Objectives:

- To understand and write the scripts and functions of MATLAB program using OCTAVE software.
- To impart the knowledge of MATLAB constants, variables and expressions in the scientific calculations.
- To expose the students to the knowledge of vectors, scalars and its basic operations
- To perform different operations on polynomials and evaluate with matrix arguments
- To learn the basic feature of plotting a 2-D and 3-D graph in MATLAB graphics.

UNIT-1: Introduction to MATLAB

Introduction – Major components of MATLAB environment – Help browser and help command – Different types of files used in MATLAB – Various platforms – Some useful MATLAB commands

UNIT -2: Constants, variables and expressions

Character set – Data types – Constants and variables – Operators – Hierarchy of operations – Built in functions – Assignment statement

UNIT-3 : Vectors and matrices

Scalars and vectors – Entering data in matrices – Line continuation – Matrix subscripts/indices – Multidimensional matrices and arrays – Matrix manipulations – Generation of special matrices – Some useful commands related to matrices – Matrix and array operations – Functions with array inputs – Structure arrays – Cell arrays – Some useful commands of structures and cells.

UNIT-4: Polynomials

Entering a polynomial – Polynomial evaluation – Roots of a polynomial – Polynomial addition and subtraction – Polynomial multiplication – Polynomial division – Formulation of polynomial equation – Characteristic polynomial of a matrix – Polynomial differentiation – Polynomial integration – Polynomial curve fitting – Evaluation of polynomials with matrix arguments

UNIT-5 : MATLAB graphics

Two dimensional plots – Multiple plots – Style options – Legend command – Sub plots – Specialized two-dimensional plots – Three dimensional plots.

Text book:

[1] MATLAB and its Applications in Engineering, Rajkumar Bansal, Ashok Kumar Goel and Manoj Kumar Sharma, Pearson Education, 2008.

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