

COURSE: BASICS OF MATLAB

OBJECTIVE OF COURSE:

MATLAB is a programming and numeric computing platform used by engineers and scientists to analyse data, develop algorithms and create models. SIMULINK is graphical interface where circuits and systems can be developed and analysed for better understanding of concepts. The objective of the course is to learn MATLAB and SIMULINK and use it to analyse the circuits of power electronics subject.

DURATION OF COURSE: 60 HOURS (4 WEEKS)

MINIMUM ELIGIBILITY CRITERIA AND PRE-REQUISITE:

All applicants must have active student status, minimally completed at least two years of Diploma course work in Electrical Engineering or equivalent.

Course Content

Module 1 (Week 1- 16 hours):

INTRODUCTION: Set-up and start a MATLAB environment. Introduction to MATLAB and its basic commands. Introduction to SIMULINK tool.

COMPUTATION USING MATLAB: Eigen values and eigen vectors of a square matrix, roots of a polynomial, differential equations, Integrate and differentiate sine wave and display result.

PLOTS AND TIME RESPONSE: Plot of 2D Curves, Plot of 3D Curves, Step, Ramp and impulse response of transfer function, time response of RLC circuit, computation exercises.

Module 2 (Week 2 - 16 hours):

SINGLE PHASE RECTIFIERS: Learn how to simulate power electronics devices in MATLAB/Simulink, Simulation of Single-Phase half-wave rectifiers with various types of loads, Single-Phase fully-controlled rectifiers with various types of loads, single-Phase half-controlled rectifiers with various types of loads,

THREE PHASE RECTIFIERS: Simulation of three-Phase half-wave rectifiers with various types of loads, three-Phase fully-controlled rectifiers with various types of loads, three-Phase half-controlled rectifiers with various types of loads.

Module 3 (Week 3 – 14 hours):

DUAL AND DC_DC CONVERTERS: Simulation of Dual-Converter, buck converters, boost converters, buck-boost converters.

AC REGULATOR AND CYCLOCONVERTER: Simulation of ac regulator, single-phase cycloconverter.

Module 4 (Week 4 – 14 hours):

SINGLE AND THREE PHASE INVERTERS: Simulation of single-phase inverters & three-phase inverters.

AC AND DC LINK CONVERTERS: Simulation of ac link chopper (DC-AC-DC) & dc link converter (AC-DC-AC).

FORMATTING: Learn how to improve analysis, formatting and result reporting.