



GOVERNMENT OF TAMILNADU

DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI-25

STATE PROJECT COORDINATION UNIT

(Established under Canada India Institutional Cooperation Project)

CURRICULUM

Course Name	MATLAB SIMULATION
Course Code	EC/2020/010
Course Duration	60 Hours
Minimum Eligibility Criteria	10 th /+2 /ITI/Diploma/Graduate
Pre-requisites (if any)	-
Course Objectives	Training module has been designed for the participants to - Gain and share some knowledge on Modelling and Simulation using MATLAB. - Learn how to create M Files, Arithmetic function and variables. - Practice with simulation of Mathematical Equation and Various Circuits in Simulink.
Course Outcomes	At the end of training, the trainees will be able to - Create Mathematical functions, Variable and Matrices in MATLAB and Plot/Get the response or output. - Simulate the Rectifiers and Power Electronics Converters in Simulink. - Analyse the output or response of mathematical and Logic expression.
Expected Job Roles	MATLAB Programmer

TEACHING AND SCHEME OF EXAMINATION						
Course Code	Course Name	Hours		Assessment Marks		Duration of Examination
				Min	Max	
EC/2020/010	MATLAB SIMULATION	Theory	24	10	20	3 Hours
		Practical	36	40	80	
		Total	60	50	100	

EC/2020/010- MATLAB SIMULATION
DETAILED SYLLABUS

Unit No	Modules	No.of.Hours	
		Theory	Practical
I	Introduction to MATLAB	25 Hours	
1.1	Introduction to MATLAB software	10	15
1.2	Command Window - Save the workspace - CLC, Home and Help Commands in Matlab workspace		
1.3	Basic Arithmetic functions in Matlab - Create variables in Matlab and store data in them		
1.4	Creating M-File, M – File Editor , Debugging M File		
1.5	Order of Operations in Matlab - Exponent & pi - Introduction to Trigonometry in Matlab		
1.6	Introduction to Complex Numbers in Matlab		
1.7	Introduction to Matrices in Matlab Programming		
1.8	Works with matrices and do symbolic matrix calculations.		
1.9	Plotting in MATLAB		
II	MATLAB - Simulink	25 Hours	
2.1	Basics of Simulation and Simulink – Simulink Library	10	15
2.2	Engineering applications of MATLAB simulink		
2.3	Circuit Elements – DC and AC Circuit Analysis		
2.4	Develop and Simulate a Battery model in Simulink		
2.5	Develop Rectifier, Clipper and Clamper, RC Circuit Model in Simulink		
2.6	Steady state analysis of Linear Circuit		
2.7	Power Electronics: Phase Controlled Rectifiers, Chopper and PWM Inverter in Simulink		
III	Mathematical Equation in Simulink	10 Hours	
3.1	Implement a Mathematical Equation in Simulink	04	06
3.2	Boolean Expressions for Logic Gate, Half Adder and Full Adder in Simulink		
3.3	Differentiation and integration operation in Simulink		
3.4	Proportional Integral Derivative (PID) Controllers		
Total theory / Practical Hours		24	36
Total hours		60	

HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS
1	PC/Laptop

SOFTWARE REQUIREMENT

S.NO	LIST OF SOFTWARE
1	MATLAB

REFERENCE BOOKS

S.NO	NAME OF THE BOOK	AUTHOR	PUBLISHER
1	Beginning MATLAB and Simulink: From Novice to Professional	SulaymonEshkabilov	Apress
2	Power Electronics with MATLAB	L. Ashok Kumar, ,A. Kalaiarasi Y. Uma Maheswari	Cambridge University Press.
3	Power Electronic Converters: Interactive Modelling Using Simulink	Narayanaswamy P R Iyer	CRC Press

ASSESSMENT AND CERTIFICATION

S.No	Criteria for assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the CIICP Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the CIICP Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training, certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.

END EXAMINATION

ALLOCATION OF MARKS

S.NO	Description	Max. Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Objective and Simulation Circuit	20
	b)Procedure and Connections / Execution	20
	c)Result and Viva	20
	d)Record	20
Total Marks		100

THEORY MODEL QUESTION PAPER

EC/2020/010 – MATLAB SIMULATION

(Maximum Marks: 20)

(N.B: Answer any Twenty questions)

20x1= 20 Marks

1. What does MATLAB stand for?
2. What are the different windows used in MATLAB software?
3. What is the function of CLC Command in MATLAB?
4. What are the basic arithmetic functions in MATLAB?
5. What is the other name of M-file?
6. Write an expression to calculate the area of a circle in MATLAB.
7. Write an expression to calculate the exponential value in MATLAB.
8. Write an expression to calculate trigonometric function in MATLAB.
9. Write a MATLAB function to get the real part of the complex number $3 + 2i$.
10. Draw a symbol of scope using MATLAB Simulink..
11. What is maximum power transfer theorem?
12. Draw a Series RL circuit using MATLAB Simulink.
13. What is full wave rectifier?
14. What are the classifications of DC chopper?
15. Draw a circuit diagram of positive clipper.
16. Draw an input and output waveform of negative clipper.
17. Draw a circuit diagram of negative clamper.
18. Expand the term PWM.
19. Draw a NAND gate using MATLAB Simulink.
20. Draw a HALF ADDER using MATLAB Simulink.
21. Expand the term PID.
22. Write the truth table for FULL ADDER.
23. Draw a symbol of DIODE using MATLAB Simulink.
24. Draw a model for a mechanical accelerometer system using MATLAB Simulink.
25. What is Simulink?