MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous& NAAC Accredited Institute Affiliated to RGPV, Bhopal)

DEPARTMENT OF ELECTRONICS ENGINEERING

SEP 2022
Module1: Computer Aided Control and Automation

Name of Module	Computer Aided Control and Automation
Name of Module Coordinator	Dr. R. P. Narwaria, Prof. D. K. Parsediya
Email and contact details of Module Coordinator	rpnarwaria@mitsgwalior.in 9301950530 parsediyadeep@mitsgwalior.in 8989474070
Objectives	To understand the basics of computer-based control system with designing of ladder logics for process control applications using PLC
content	Computer-based measurement and control systems, Basic components, Architecture and Hardware of computer-based process control system, Role of computers in process control, Human Machine Interface, Introduction to PLC, ladder logic, FBD
Mode of Delivery (online/offline/Blended)	online
Outcomes	Students will be able to • Understand the fundamental principle of Computer based Control System. • Design ladder logics of process control applications using PLC.
Drive link of Modules information video	https://drive.google.com/file/d/1e3geYSmp6bFEZJlhmlphJCwIjeuGJIi_/view?usp=sharing

Day Wise Schedule

	Date	Day	Module Contents to be covered/ Interactive Session/ Assignment/ Quiz/ Exercises/ Daily practice sheets (DPP)/Tutorial/Project etc(10:00 AM onward, 2-3 Hrs/ Day)	Faculty
Week1	13/06/2022	Monday	Basic control system terminology, Open loop and Closed loop system, Feedback control	Dr. R. P. Narwaria
	14/06/2022	Tuesday	Transfer function of linear systems	Dr. R. P. Narwaria
	15/06/2022	Wednesday	Different test input signals, First order systems	Dr. R. P. Narwaria
	16/06/2022	Thursday	Concept of stability of linear systems	Dr. R. P. Narwaria
	17/06/2022	Friday	Computer-based measurement and control systems	Dr. R. P. Narwaria
Week 2	20/06/2022	Monday	Basic components, Architecture and Hardware of computer-based process control system	Dr. R. P. Narwaria
	21/06/2022	Tuesday	Role of computers in process control	Dr. R. P. Narwaria
	22/06/2022	Wednesday	Human Machine Interface, and Interfacing computer system withprocess	Dr. R. P. Narwaria
	23/06/2022	Thursday	Introduction to Artificial Neural Network	Dr. R. P. Narwaria
	24/06/2022	Friday	Artificial Neural Network (ANN) Based Control	Dr. R. P. Narwaria
Week 3	27/06/2022	Monday	Introduction to Programmable logic Controller	Deep Kishore Parsediya

	28/06/2022	Tuesday	Automation through controller	Deep Kishore Parsediya
	29/06/2022	Wednesday	PLC I/O addressing	Deep Kishore Parsediya
	30/06/2022	Thursday	Timers & counters	Deep Kishore Parsediya
	01/07/2022	Friday	Interfacing of sensors	Deep Kishore Parsediya
Week 4	04/07/2022	Monday	Interfacing of Actuators	Deep Kishore Parsediya
	05/07/2022	Tuesday	FBD for ladder programming	Deep Kishore Parsediya
	06/07/2022	Wednesday	Introduction to Software tool for ladder programming	Deep Kishore Parsediya
	07/07/2022	Thursday	Hands on Session Ladder programming,	Deep Kishore Parsediya
	08/07/2022	Friday	Concluding Remarks by all Faculties	Both faculty
Week 5	11/07/2022	Monday	Evaluation Quiz	
Module Coordinators Email Id and Mobile Number	1) Dr. R. P. Narwaria– rpnarwaria@mitsgwalior.in (9301950530) 2) Prof. D. K. Parsediya – parsediyadeep@gmail.com, (898947070)			

Skills Enhancement Program -2022

Module 2
Robotics and Automation

Name of Department	Department of Electronics Engineering
Module Name	**Robotics and Automation**
Module Coordinators	1)Dr. Rahul Dubey 2)Dr. VikasMahor
Module Objective	Robotics is an interdisciplinary domain which effectively involves electronics. The objective of this online internship is to give the basic idea about designing and functioning of basic industrial robots and application of microcontroller programming for a robot. The software is designed by researcher of IIT Delhi to help students in the designing of DH parameter, degree of freedom for a Robot.
Module Content	Introduction to Robotics, Designing of Controller, Robot Dynamics, Degree of Freedom, Hands on Session on Robo-Analyzer Software, Embedded System for Robotic design, Hands-on session on EdSim51 simulation software.
Module Methodology	The workshop will start with various aspects of robotic design such as controller designing, robot dynamics, embedded system employed in robotic designing and PLC technology. Further, Various hands-on session is scheduled on various freeware software used in robotic and automated designs such as: RoboAnalyzr, TinkerCAD and edSim51.
Module Outcome/ Impact	• Understand the basics of Robotics and Automation in the context using Robotic products. • Understand the various skills for robotic and automated system design. • Understanding the process configurations and their realization of given automated system. • Able to design and simulate automated systems and robots.
Duration	4 Weeks (30 days)

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Day Wise Schedule				
Week	**Date**	**Day**	**Module Contents to be covered/ Interactive Session/ Assignment/ Quiz/ Exercises/ Daily practice sheets (DPP)/Tutorial/Project etc(10:00 AM onward, 4 Hrs/ Day)**	**Faculty**
Week 1	13/06/2022	Monday	Robotics: Definitions & History	Dr. Rahul Dubey
	14/06/2022	Tuesday	Nature Inspired Robots: Biomimicry MATLAB Basics	Dr. Rahul Dubey
	15/06/2022	Wednesday	Time domain & Frequency domain Analysis	Dr. Rahul Dubey
	16/06/2022	Thursday	Introduction to controller	Dr. Rahul Dubey
	17/06/2022	Friday	Computer-based measurement and control systems	Dr. Rahul Dubey
Week 2	20/06/2022	Monday	Basic components, Architecture and Hardware of computer-based process control system	Dr. Rahul Dubey
	21/06/2022	Tuesday	Introduction to DH Parameters	Dr. Rahul Dubey
	22/06/2022	Wednesday	Introduction to Forward Kinematics	Dr. Rahul Dubey
	23/06/2022	Thursday	Introduction to Inverse Kinematics	Dr. Rahul Dubey
	24/06/2022	Friday	Introduction to Robot Dynamics	Dr. Rahul Dubey
Week 3	27/06/2022	Monday	Calculation of Degree of Freedom	Dr. Rahul Dubey
	28/06/2022	Tuesday	Hands on Session on Homogeneous Transformation using RoboAnalyzer - I	Dr. Rahul Dubey
	29/06/2022	Wednesday	Hands on Session on Homogeneous Transformation using RoboAnalyzer – I	Dr. Rahul Dubey
	30/06/2022	Thursday	Introduction to Embedded System, Applications of Embedded System	Dr. Vikas Mahor
	01/07/2022	Friday	Using 8051 as a microcontroller in an embedded system. Introduction to the concepts of 8051 Microcontroller, Pin	Dr. Vikas Mahor

			architecture and Programs for 8051 Micro controller.	
Week 4	04/07/2022	Monday	Introduction to 8051 simulator EdSim51. Installation of the software and simulating the first program.	Dr. Vikas Mahor
	05/07/2022	Tuesday	Hands-on session I on EdSim51: 1. Simulate a program to interface LED with 8051 and display a string on LCD. 2. Simulate a Program to interface a Seven Segment Display with 8051 and display a result of arithmetic operation on it.	Dr. Vikas Mahor
	06/07/2022	Wednesday	Hands-on session II on EdSim51: 1. Simulate a program to interface DAC with 8051 and generate unit-step, saw-tooth and triangular waveform. 2. Simulate a program to interface Stepper motor with 8051 and generate clockwise and anti-clockwise motion	Dr. Vikas Mahor
	07/07/2022	Thursday	Hands on session III on EdSim51: 1. Simulate a program to interface 10 LED lights with 8051 and perform rotating light operation. (VM) 2. Simulate a program to operate internal timer of 8051 as event counter.	Dr. Vikas Mahor
	08/07/2022	Friday	Introduction to Arduino Board for Embedded System Development	Dr. Vikas Mahor
Week 5	11/07/2022	Monday	Arduino Programming -I	Dr. Vikas Mahor
	12/07/2022	Tuesday	Arduino Programming -II	Dr. Vikas Mahor
Module Coordinators Email Id and Mobile Number	1) Dr. Rahul Dubey – rahul@mitsgwalior.in (9165577117) 2) Dr. Vikas Mahor – vikas@gmail.com, (7000771599)			

Department of Electronics Engineering

Skills Enhancement Programm-2022
Module 3: Programming in SCILAB

Name of Module	**Programming in SCILAB**
Name of Module Coordinator	Dr. Deepak Batham Dr. Shubhi Kansal
Email and Contact Detail of Module Coordinator	Dr. Deepak Batham dbatham@mitsgwalior.in Contact No.: 9755395903 Dr. Shubhi Kansal shubhik@mitsgwalior.in Contact No.: 7827822996
Objective	1. To explore SCILAB software. 2. To learn the basics of SCILAB programming. 3. To learn simulation basics using XCOS in SCILAB. 4. To solve engineering calculations using SCILAB.
Content	In this program students/participants become familiar with Scilab, • Introduction to Scilab, Installation and its use. • Simple Numerical Calculations • Column and Row vectors, Array & Matrix representation. • Array and Matrix Operations. • Plotting (2-D, 3-D) • Loops • Programming, Script writing • Functions/Command • Xcos-Simulation tool. • Applications of Xcos-Signals Representation, Digital Electronics and Control Engineering.
Mode of Delivery	Blended (Online/Offline)
Outcomes	After the completion of the internship, student are able to- 1. Use Scilab software. 2. Do programming in Scilab. 3. Design & simulate the analog and digital electronics circuits using Xcos in Scilab.
Drive Link for Module Information Video	https://drive.google.com/file/d/1-mZ0B5n5CDaFVt4iTSd4jubzk4cFnKzN/view?usp=sharing

Day wise schedule				
Programming in SCILAB				
	Date	**Day**	**Module Contents to be covered/Interactive Session/Assignment/ Quiz/ Exercises/ Daily practice sheets (DPP)/ Tutorial/ Project etc. (10:00 AM onward, 2-3 Hrs/ Day)**	**Faculty**
Week 1	13/06/2022	Monday	Introduction to Scilab, Installation and its use.	Dr. Deepak Batham
	14/06/2022	Tuesday	Basic Arithmetical operations, Numeric Calculations	Dr. Shubhi Kansal
	15/06/2022	Wednesday	Vectors and array (Column and row)	Dr. Shubhi Kansal
	16/06/2022	Thursday	Array and Matrix operations	Dr. Shubhi Kansal
	17/06/2022	Friday	2 dimensional (2D) plots Analog Signals	Dr. Shubhi Kansal
Week 2	20/06/2022	Monday	2 dimensional (2D) plots Digital Signals	Dr. Shubhi Kansal
	21/06/2022	Tuesday	3 dimensional (3D) plots	Dr. Shubhi Kansal
	22/06/2022	Wednesday	Loops	Dr. Shubhi Kansal
	23/06/2022	Thursday	Script writing	Dr. Shubhi Kansal
	24/06/2022	Friday	Functions design and call.	Dr. Shubhi Kansal
Week 3	27/06/2022	Monday	Practice problem on programming.	Dr. Shubhi Kansal
	28/06/2022	Tuesday	Introduction to Xcos, How to used Xcos & its applications.	Dr. Deepak Batham
	29/06/2022	Wednesday	Digital Electronics-Basic and universal gates & designing using Xcos	Dr. Deepak Batham
	30/06/2022	Thursday	Combinational circuit Designing- Half and Full Adder.	Dr. Deepak Batham
	01/07/2022	Friday	Half and Full subtractor	Dr. Deepak Batham
Week 4	04/07/2022	Monday	Design of Multiplexer.	Dr. Deepak Batham
	05/07/2022	Tuesday	Design of Basic	Dr. Deepak

			Electrical circuits, KCL, KVL, RLC circuit design	Batham
	06/07/2022	Wednesday	Types of signals generation and analysis.	Dr. Deepak Batham
	07/07/2022	Thursday	First order control system design using Xcos	Dr. Deepak Batham
	08/07/2022	Friday	Second order control system design using Xcos.	Dr. Deepak Batham
Week 5	11/07/2022	Monday	Concluding Remarks by all Faculties	All Faculties
	12/07/2022	Tuesday	Final Evaluation & Submission	All faculty
Module Coordinators Email Id and Mobile Number	1. Dr. Deepak Batham Email: dbatham@mitsgwalior.in Contact No.: 9755395903 2. Dr. Shubhi Kansal Email: shubhik@mitsgwalior.in Contact No.: 7827822996			