MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous& NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Finishing School Program (Online Internship)-2020

Name of Department	**Department of Electronics Engineering**
Module Name	**Robotics and Automation**
Module Coordinators	1)Dr. Rahul Dubey 2)Dr. Vikas Mahor 3)Prof. Rishabh Shukla 4)Prof. Awadhesh Gupta 5)Prof. Deep Kishore Parsediya 6) Dr. R. P. Narwaria
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. Arduino Uno Programming, Hands on Session on Autodesk TinkerCAD, Introduction to PLC.
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, ARDUINO IDE 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	5 Weeks (30 days)

MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous& NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Finishing School Program (Online Internship)-2020

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**
Week 1	**19/05/2020**	Tue	Robotics: Definitions & History Nature Inspired Robots: Biomimicry MATLAB basics	Prof. Awadhesh Gupta
	20/05/2020	Wed	Time domain & Frequency domain Analysis	Prof. Awadhesh Gupta
	21/05/2020	Thu	Introduction to controller	Prof. Rishabh Shukla
	22/05/2020	Fri	Designing of Controller-PartI	Prof. Rishabh Shukla
	23/05/2020	Sat	Designing of Controller-PartII	Prof. Rishabh Shukla
	25/05/2020	Mon	Spatial Transformation	Prof. Awadhesh Gupta
Week 2	**26/05/2020**	Tue	Introduction to DH Parameters	Prof. Rishabh Shukla
	27/05/2020	Wed	Introduction to Forward Kinematics	Prof. Rishabh Shukla
	28/05/2020	Thu	Introduction to Inverse Kinematics	Dr. Rahul Dubey
	29/05/2020	Fri	Robot Dynamics	Dr. Rahul Dubey
	30/05/2020	Sat	Calculation of Degree of Freedom	Dr. Rahul Dubey
	01/06/2020	Mon	Hands on Session on Homogeneous Transformation using RoboAnalyzer	Dr. Rahul Dubey
Week 3	**02/06/2020**	Tue	Introduction to Embedded System, Applications of Embedded System	Dr. Vikas Mahor
	03/06/2020	Wed	Using 8051 as a microcontroller in an embedded system. Introduction to the concepts of 8051 Microcontroller, Pin architecture and Programs for 8051 Micro controller.	Dr. Vikas Mahor
	04/06/2020	Thu	Introduction to 8051 simulator EdSim51. Installation of the software and simulating the first program.	Dr. Vikas Mahor
	05/06/2020	Fri	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

MADHAV INSTITUTE OF TECHNOLOGY AND SCIENCE, GWALIOR
(A Govt. Aided UGC Autonomous& NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Finishing School Program (Online Internship)-2020

	06/06/2020	Sat	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
	08/06/2020	Mon	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
Week 4	**09/06/2020**	Tue	Arduino Uno Programming: Basics, Hands on Session on Autodesk Tinkercad	Prof. Awadhesh Gupta
	10/06/2020	Wed	Arduino Uno Programming: Robotics Sensors and Actuators,Hands on Session on Autodesk Tinkercad, Some Project demonstration using Arduino Uno	Prof. AwadheshGupta
	11/06/2020	Thu	Introduction to neural network	Dr. R. P. Narwaria
	12/06/2020	Fri	Designing of neural network Part I	Dr. R. P. Narwaria
	13/06/2020	Sat	Designing of neural network Part II	Dr. R. P. Narwaria
	15/06/2020	Mon	Neural network in robotics	Dr. R. P. Narwaria
Week 5	**16/06/2020**	Tue	Introduction to PLC, I/O addressing	Prof. Deep KishoreParsediya
	17/06/2020	Wed	FBD for ladder programming	Prof. Deep Kishore Parsediya
	18/06/2020	Thu	Introduction to Software tool for ladder programming	Prof. Deep Kishore Parsediya
	19/06/2020	Fri	Hands on Session: Ladder programming,	Prof. Deep Kishore Parsediya
	20/06/2020	Sat	Concluding Remarks by all Faculties	All faculty
Module Coordinators Email Id and Mobile Number			1) Dr. Rahul Dubey– rahul@mitsgwalior.in, (9165577117) 2)Dr. Vikas Mahor– vikas@mitsgwalior.in, (7354877010) 3) Prof. Rishabh Shukla – rs.svnit@gmail.com, (8140427346) 4) Prof. Awadhesh Gupta – awadesh2911@gmail.com, (9198670096) 5) Prof. D. K. Parsediya– parsediyadeep@gmail.com, (8989474070) 6) Dr. R. P. Narwaria – rpnarwaria@gmail.com, (9301950530)	

Finishing School Program (Online Internship)-2020

Eligibility and Important Instructions:-

1. The Online Finishing School Program (Online training/Internship) is designed only for Pre-final & Final Year students of Electronics Engineering Department.

2. The students may apply online.

3. The Online Finishing School Program/ Summer Internship Program is free for the participants of Pre-final & Final year students of MITS, Gwalior.

4. The participants outside the Institute may also join the Program on payment basis.

5. This online module will be conducted under the Finishing School Program which will be considered equivalent to Online Internship of Pre-final year students who could not get any Internship during this situation.

6. Duration of this program will be of four weeks which is equivalent to summer Internship period as per AICTE and our Institute policy. Daily no. of hours of online training may be flexible.

7. Certificates will be issued to candidates who have attendance 75% or more and also score more than 60% in the test.