

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING AND TECHNOLOGY (ELECTRICAL ENGINEERING)									
Programme	Diploma Engineering				Branch/Spec	Electrical Engineering			
Semester	v				Version	1.0.0.0			
Effective from Academic Year		2020-21			Effective for the batch Admitted in			July2018	
Subject code	1EE2503		Subject Name		MICROPROCESSOR AND CONTROLLER APPLICATIONS				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total	CE	SEE	Total	
	L	TU	P	TW					
Credit	4	0	1	0	5	Theory	40	60	100
Hours	4	0	2	0	6	Practical	20	30	50

Course Learning Outcomes:									
<p>The theory should be taught and practical should be undertaken in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domains to demonstrate the following course outcomes:</p> <ul style="list-style-type: none"> <li>• Distinguish Micro processors, microcontrollers and PLC based control systems.</li> <li>• Maintain microprocessor-based systems.</li> <li>• Maintain microcontroller-based systems.</li> <li>• Maintain PLC-based systems.</li> <li>• Maintain SCADA-based systems.</li> </ul>									

Theory syllabus				
UNIT	Unit Content	Unit Learning Outcomes	Marks	Hrs
Unit – I Control Systems Components	1.1 Role of control system in instrumentation 1.2 Open and close loop control system, types and Block diagram 1.3 Servomechanism and regulators with suitable examples 1.4 Basic control system components –AC/ DC Servo motor, AC/ DC Tacho generator, Stepper motor and Synchro	1a. Role of control system in Instrumentation 1b. Open and close loop control system, types and Block diagram 1c. Servomechanism and regulators with suitable examples 1d. Basic control system components –AC/ DC Servo motor, AC/ DC Tacho generator, Stepper motor and Synchro	14	14
Unit – II Basics of Microprocessor	2.1 Introduction to microprocessor 2.2 Advantages and disadvantages of microprocessor control 2.3 Structure of microprocessor, Generalized architecture of microprocessor, functions of each block 2.4 Functional block diagram Of 8085 microprocessor With pin diagram, logical block diagram of 8085 microprocessor-Registers,	2a. Functions of each block of generalize microprocessors 2b. Advantages and disadvantages of microprocessor control 2c. Microprocessor architecture with the help of suitable block diagram 2d. Memory organization of 8085 Microprocessor. 2e. Timing and control section 2f. Classify instruction set of 8085 microprocessor 2g. Develop Basic assembly language program using	12	12

	<p>ALU, memory organization, decoder, serial control section, interrupt section, timing and control section</p> <p>2.5 Assembly language Programming of 8085, Addressing Modes, Instruction classification, Instruction formats</p> <p>2.6 Basic Assembly Language programming ( only simple arithmetic operations- addition,subtraction)</p>	<p>basic instruction for the given application.</p> <p>2h. Machine cycle, T-state</p>		
<p>Unit – III Basics of Microcontroller 8051</p>	<p>3.1 Microcontrollers and microprocessors</p> <p>3.2 Pin diagram of 8051 microcontroller</p> <p>3.3 Internal RAM, ROM and Special function Registers in 8051chip</p> <p>3.4 I/O ports</p> <p>3.5 Counters and Timers</p> <p>3.6 Interfacing with external memory</p>	<p>3a. Compare microcontrollers and microprocessors</p> <p>3b. 8051 architecture with block diagram</p> <p>3c. Function of each pins of 8051 chip</p> <p>3d. Registers and their functions of 8051</p> <p>3e. Program the I/O ports for data transfer</p> <p>3f. Program the timer and counter for required time delay generation.</p> <p>3g. Program the I/O ports for interfacing external memory</p>	12	12
<p>Unit - IV Microprocessor and Microcontroller Applications</p>	<p>4.1 Different types of memories: ROM, RAM, PROM, EPROM, EEPROM</p> <p>4.2 Schematic diagram of memory chips decoder, memory interfacing.</p> <p>4.3 Memory I/O data transfer Scheme for 8255.</p> <p>4.4 Interfacing of switches and LEDs</p> <p>4.5 Simple applications of microprocessor and microcontroller for temperature control of furnace, Traffic light control and SCR firing angle control using micro processor, Data acquisition System.</p>	<p>4a. Compare various types of semiconductor memories</p> <p>4b. Interfacing of microprocessor with memory</p> <p>4c. Describe function of 8255 with the help of suitable block diagram</p> <p>4d. Use of Microprocessor/microcontroller for switch and LEDs control.</p> <p>4e. use of microprocessor/microcontroller for temperature control of furnace</p> <p>4f. Use of microprocessor/microcontroller for Traffic light controller</p> <p>4g. Use microprocessor for SCR firing angle control</p> <p>4h. Block diagram explaining Data acquisition system</p>	12	12
<p>Unit - V Programmable Logic Controller And SCADA</p>	<p>5.1 PLC:CPU, I/O modules, bus system, power supplies and remote I/Os, counter, timer</p> <p>5.2 Different PLC's available in</p>	<p>5a. Working of each module of PLC</p> <p>5b. Criteria for the selection of PLC for the give application</p>	10	10

	market 5.3 Selection of a PLC 5.4 SCADA- Concept and Application	5c. Functions of SCADA		
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List of Practical	
1	Control angular displacement using Synchro.
2	Regulate speed of DC motor using tacho generator.
3	Develop assembly language program for arithmetic addition of two numbers using $\mu$ P 8085 kit.
4	Develop assembly language program for arithmetic subtraction of two numbers using $\mu$ P 8085 kit.
5	Develop assembly language program for arithmetic multiplication of two numbers using $\mu$ P 8085 kit.
6	Interface seven segment LED display with 8051 kit.
7	Interface LCD display with 8051 kit.
8	Control speed of stepper motor using 8051 kit.
9	Interface programmable device like 8255 with $\mu$ P 8085
10	Interface switches and LEDs using $\mu$ P 8085
11	Control temperature using the 8085 application module
12	Use $\mu$ P 8085 for SCR firing angle control.
13	Control Traffic light system using $\mu$ P 8085
14	Use arithmetic function of PLC for a typical application.
15	Use timer function of PLC for a typical application(introduce delay).

List of Instruments/Equipments/ Trainer Board	
1	Trainer kit of speed control and speed regulation of DC motor using Techo Generator.
2	Trainer kit of Synchro transmitter and receiver.
3	Microprocessor 8085 kit with necessary accessories.
4	8255 interfacing kit.
5	Microcontroller 8051 kit with necessary accessories.
6	Kit for add on cards for performing different applications of PLC
7	Power supply for above kits and applications

List of Text Books			
1	Fundamentals of Microprocessors and Microcontrollers	Ram, B.	Dhanpat Rai Publications, New Delhi

List of Reference Books			
1	Microprocessor and Microtrollers	A.P.Godse, D.A.Godse	Technical Publications
2.	Microprocessor Architecture, Programming and Applications with 8085	Gaonkar, Ramesh S.	Penram International Publishing (India)Pvt.Ltd. New Delhi (5th Edition)

Link of Learning Resources	
1	<a href="http://www.keil.com/">www.keil.com/</a>