

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING AND TECHNOLOGY (DIPLOMA PROGRAMMES)									
Programme		Diploma Engineering				Branch/Spec.		Mechatronics Engineering	
Semester		I				Version		1.0.0.0	
Effective from Academic Year			2018-19			Effective for the batch Admitted in			June 2018
Subject code		1ES111		Subject Name		Mechatronics Workshop			
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	0	0	2	0	2	Theory	00	00	00
Hours	0	0	4	0	4	Practical	60	40	100
Pre-requisites:									
Learning Outcome:									
The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.									
I. To develop skills to operate electronic instruments									
II. To identify electronic components									
III. To design basic electronic circuits on PCB									
IV. To familiar with electronic simulation software									
Practical Syllabus									
Unit	Content								Hrs
1	ELECTRONIC TEST EQUIPMENT DC Power Supply, CRO probe, Front panel controls of CRO, Observe waveform using CRO, Front panel controls of Function Generator, Functions: sine wave, square wave, triangular wave and Amplitude measurement, Analog and Digital Multi meter.								10
2	BASIC ELECTRONIC COMPONENTS Concept of Resistors, Colour Coding, Tolerance, Maximum power rating, Application of LDR, Classification of capacitors, Coding of capacitors using numerals directly printed values on capacitors, Ceramic capacitor and Electrolytic capacitor, Concept of Inductors, Concept of Transformer, Types: step-up and step-down, Testing of components using Multi meter and LCR Q-meter								10
3	ACTIVE ELECTRONIC COMPONENTS Concept of Diode, PN junction diode, Zener diode, LED, Photo diode, Terminal identification, Symbols of Transistors, Types of transistor: NPN and PNP, terminal identification and testing, IC, Pin diagram, Integrated Circuits (ICs) like 7404, 7408, 7432, 7805, Timer IC555, OPAMP IC741, Concept of switches, Application of Toggle, Rotary, push to on & push to off, Concept of Relays, Application of General purpose relay, NO,NC contact, reed relays, solid state relays.								10
4	CIRCUIT CONNECTIONS Study of breadboard connections, Design Circuits, Construction of various electronic circuits on								10

	Breadboard, Circuits like: rectifiers, filter circuits, clipper, clamper, transistor amplifiers, logic gates, LED driver circuit, power supply, etc, Observe Outputs on CRO, Testing of outputs of various electronic circuits using test Equipment.	
5	SIMULATION SOFTWARE AND DATA BOOKS Study of Simulation Software like: Circuit Maker, Multisim, Use of Data Books for searching component specifications, Use of internet for component specifications and IC datasheets.	10
6	MECHATRONICS ELEMENT Demonstrate Hydraulic components (Cylinder, Valves, pump, hydraulic motor), Demonstrate Pneumatic components (Cylinder, Valves, Compressor, FRL unit), Demonstrate Sensor (Proximity Sensor, Limit Switch)	10
Practical content		
<p>Practical based on above syllabus are:</p> <ol style="list-style-type: none"> 1. Observe different types of waveforms on CRO 2. Measure voltage and frequency using CRO 3. Identify, find value and test different types of Resistors 4. Identify, find value and test different types of Capacitors 5. Identify, find value and test different types of Inductors 6. Test different types of passive components using LCR Q-meter 7. Identify and test different types of Diodes and Transistors 8. Identify and test different types of Logic ICs 9. Identify and test different types of three terminal voltage regulator ICs 10. Identify and test different types of Switches and Relays 11. Perform resistors in series connection on bread board 12. Perform resistors in parallel connection on bread board 13. Perform LED and 7 segment connection on bread board 14. Perform Soldering Practice on general purpose PCB 15. Study of simulation software: Multisim 16. Perform basic circuits on simulation software: Multisim 17. Make one mini project which related to Robotics and Automation. 18. Use Data Sheet to search specifications of components 19. Demonstrate the hydraulic components 20. Demonstrate the pneumatics components 21. Demonstrate Simple Piston Forward and Reverse motion Hydraulic circuits 22. Demonstrate simple Piston Forward and Reverse motion pneumatic circuits 		
Text Books		
1	Principle of Electronics, V. K. Mehta, S. Chand & Co.	
Reference Books		
1	Electronic Components and Materials, Madhuri Joshi, Shroff Publishers	
2	Electronic Components Handbook, Thomas H.Jones, Reston Publishing	
3	Electronic Components and Materials, Grover & Jamwal, Dhanpat Rai & Sons	
4	Practical Semiconductor Data manuals, BPB Publications	
5	Magazine: Electronics for You	
6	Oil hydraulic system, S. R. Majumdar ,Mcgraw Hill	