

GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)

III - SEMESTER

Course Title: Automation - I

(Course Code: 1333404)

Diploma Programme in which this course is offered	Semester in which offered
Mechanical (Manufacturing Technology)	Third Semester

Module.	Topics	Hours
Module 1	Pneumatic Power and Hydraulic Power 1.1 Pneumatic power – Applications – Advantages and disadvantages 1.2 Hydraulics power – Applications – Advantages and disadvantages	2 h
Module 2	Compressed air 2.1 Characteristics of compressed air: Positive characteristics – Negative characteristics 2.2 Types of compressors: 2.2.1 Reciprocating piston compressor 2.2.2 Rotary piston compressor 2.2.3 Screw compressor 2.2.4 FRL Unit – Description and Application 2.2.5 Care and maintenance of Compressors 2.3 Terms associated with compressor: Delivery volume – Working pressure – Operation pressure	4 h
Module 3	Pneumatics working elements 3.1 Pneumatics cylinders: Construction, Working principle, Specification and Applications of 3.1.1 Single acting cylinder 3.1.2 Double acting cylinder 3.2 Pneumatic valves: Construction details and functioning of 3.2.1 Directional valves 3.2.2 Flow control valves 3.2.3 Pressure control valves 3.3 Pneumatic Motors 3.3.1 Construction details 3.3.2 Application 3.3.3 Care and Maintenance 3.4 Symbols used to represent Pneumatic elements as per ISO Standards	4 h
Module 4	Pneumatic circuits 4.1 Basic pneumatics circuits using SAC 4.2 Basic pneumatics circuits using DAC	3 h
Module 5	Hydraulics working elements 5.1 Pumps: 5.1.1 Constructional details of Gear pump	5 h

	<p>5.1.2 Specification and Application of Gear pump</p> <p>5.2 Hydraulic cylinders: Construction, Working principle, Specification and Applications of</p> <p>5.2.1 Single acting cylinder</p> <p>5.2.2 Double acting cylinder</p> <p>5.3 Hydraulic motor:</p> <p>5.3.1 Working principle of Hydraulics motor</p> <p>5.3.2 Specification and Application of Hydraulic motor</p> <p>5.4 Hydraulic oil: Properties, Specification and Application</p> <p>5.5 Hydraulic hoses: Types, Specification and Application</p> <p>5.6 Oil Seals, Gaskets, O-rings: Types, Specification and Application</p> <p>5.7 Filters: Functions of filter –Types of filter, Specification and Applications</p> <p>5.8 Hydraulic valves: Construction details and functioning of</p> <p>5.8.1 Directional valves</p> <p>5.8.2 Flow control valves</p> <p>5.8.3 Pressure control valves</p> <p>5.9 Symbols used to represent Hydraulic elements as per ISO Standards</p>	
Module 6	<p>Hydraulic circuits</p> <p>6.1 Basic hydraulic circuits using SAC</p> <p>6.2 Basic hydraulic circuits using DAC</p>	3 h
Module 7	Basic Maintenance Practice	3 h