GANPAT UNIVERSITY

FACULTY OF ENGINEERING& TECHNOLOGY

Programme	Bachelor of Technology	Branch/Spec.	**Automobile Engineering**
Semester	VII	Version	1.0.0.0
Effective from Academic Year	2020-21	Effective for the batch Admitted in	July 2017
Subject code	**2AE704PE2**	Subject Name	**Automotive Hydraulic and Pneumatics**

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50

Pre-requisites:

None

Objectives of the Course:

This course provides the student with a

1. comprehensive grounding in the basic principles;
2. construction and operation of hydraulic and pneumatic equipment as used in shipboard applications such as controllable pitch propellers, mooring winches, start air systems, etc.

Theory syllabus

Unit	Content	Hrs.
1	**Introduction:** Introduction, Global fluid power Scenario, Basic system of Hydraulics-Major advantages and disadvantages, Principles of Hydraulic Fluid power, Hydraulic Symbols, Electrical Elements Used in hydraulic circuits.	**4**
2	**Hydraulic Oils, Fluid Properties and Filter:** Types, Properties, physical characteristics & functions of hydraulic Oils, Classification Mineral based, Fire resistant& Biodegradable Oils, Filters, Contaminations, location of filter.	**4**
3	**Hydraulic Pumps, Motors and Actuators:** Classification of hydraulic pumps, Gear Pumps, Vane Pumps, Piston Pumps, Axial piston pumps, Hydraulic motors, Linear and Rotary Actuators, Hydrostatic Transmission Systems.	**4**
4	**Hydraulic Valves and Hydraulic system Accessories:** Direction control valves, Pressure control valves, Flow control valves, Non-return valves, Reservoirs, Accumulators, Heating & cooling devices, Hoses.	**6**
5	**Design of hydraulic circuits:** Basic hydraulic circuits, Industrial hydraulic circuits, Power losses in flow control circuits.	**5**
6	**Introduction to Pneumatics:** Basic Requirements for Pneumatic System, Applications	**4**
7	**Air Compressor and Service Unit:** Types & Selection criteria for Air Compressors, Air receiver, Pipeline Layout, Air filter, Pressure regulator and Lubricator (FRL unit).	**6**
8	**Pneumatic Cylinders, Motors and Valves:** Types of Pneumatic Cylinders & Air motors, Cushion assembly, mounting Arrangements, Pneumatic Direction control valves, Quick exhaust, Time delay Shuttle and Twin pressure valves.	**7**
9	**Pneumatic circuits:** Basic pneumatic circuits, Development of single Actuator Circuits, Development of multiple, Actuator Circuits, Cascade method for sequencing	**5**

Practical content

Practical assignments and tutorials are based on above syllabus.

Text Books

1	Oil Hydraulic Systems, S R Majumdar, Tata McGraw-Hill

2	Pneumatic Systems, S R Majumdar, Tata McGraw-Hill
Reference Books	
1	Fluid Power, Anthony Esposito, Prentice Hall
2	Hydraulics & Pneumatics, Andrew Parr, Jaico Publications
3	Industrial Hydraulics, John Pippenger & Taylor Hicks, McGraw-Hill
ICT/ MOOCs references	
1	NIL
Course Outcomes:	

1. Will be in position to device various circuit for hydraulic and pneumatic applications.
2. Will be in position to develop various hydraulic and pneumatic devices.
3. To understand and illustrate the working of various types of pumps.
4. To understand and illustrate the working of various hydraulic and pneumatic devices.