

20MD015 INDUSTRIAL HYDRAULICS AND PNEUMATICS

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Course Description and Objective: This course equips the students to know, how hydraulic and pneumatic systems works and the parameters required for selection, design, operation and maintenance.

Course Outcomes:

The student will be able to:

- Design circuits used in hydraulic systems.
- Classify the valves used in hydraulic systems.
- Maintain different valves and auxiliaries
- Assemble pumps and motors to rectify problems.
- Develop efficient hydraulic circuits.

SKILLS:

Demonstrate various accessories and their uses in hydraulic system

Draw graphical symbols.

Use directional pressure control valves for various applications.

Demonstrate application of injection control circuit.

Understand the use of pressure intensifier.

UNIT – I

L-12

Basic Principles: Principles of Hydraulics, Hydraulic pumps and their characteristics, pump selection, pumping circuits, Hydraulic actuators both linear & rotary, selection & characteristics of pumps, Hydraulic valves, pressure & Flow direction controls, applications, Hydraulic fluids, symbols.

UNIT – II

L-12

Hydraulic Circuits: Reciprocating, Quick Return, Sequencing, Synchronizing and Accumulator, Safety Circuits

UNIT - III

L-12

Design & Selection: Design of Hydraulic & Pneumatic circuits and selection of components.

UNIT - IV

L-12

Fluid Logic Control Systems: Introduction, MPL control system for fluid power circuit, Principles of Fluid logic controls, basic fluid devices, Fluidic control of fluid power system, Boolean Algebra.

UNIT – V**L-12**

Maintenance and Safety: Introduction, Scaling Devices, reservoir systems, filters and strainers, beta ratio of filters, wear of moving parts, problems caused by gases, temperature control, troubleshooting in fluid power circuits.

TEXT BOOKS:

1. J.Michael and G.Ashby, "Power Hydraulics, 2nd Edition, Prentice Hall, 1989.
2. Andrew Parr, "Hydraulics & Pneumatics", 2nd Edition, Elsevier Publications, 2006.

REFERENCE BOOKS:

1. Dudley and Pippenger, "Basic Fluidic Power", 2nd Edition, PrenticeHall, 1987.
2. Anthony Esposito, "Fluid Power with applications", 6th Edition, Prentice Hall, 2010.