

IV B.Tech I Semester

15AME60-FLUID POWER SYSTEMS

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Course Objectives:

- This course provides specialized instruction in maintaining and troubleshooting Hydraulic and Pneumatic systems.
- Explain the operation of the main elements of an industrial hydraulic and pneumatic system.

UNIT-I

OIL HYDRAULIC SYSTEMS: Hydraulic power generators – selection and specification of pumps, pump characteristics.

HYDRAULIC ACTUATORS: Hydraulic and rotary actuators – selection, specification and characteristics.

UNIT-II

CONTROL AND REGULATION ELEMENTS: Pressure – direction and flow control valves – relief valves, non-return and safety valves- actuation systems.

UNIT-III

HYDRAULIC CIRCUITS: Reciprocation, quick return, sequencing circuits- accumulator circuits- industrial circuits – press circuits – hydraulic milling machine – grinding, planning, copying, forklift, earth mover circuits – design and selection of components – safety and emergency mandrels.

UNIT-IV

PNEUMATIC SYSTEMS AND CIRCUITS: Pneumatic fundamentals- control elements position and pressure sensing – logic circuits- switching circuits- fringe condition modules and their integration – sequential circuits- cascade methods – mapping methods- step counter method – compound circuit design- combination circuit design.

UNIT-V

INSTALLATION, MAINTENANCE AND SPECIAL CIRCUITS: Pneumatic equipments- selection of components- design calculations- applications – fault finding equipments- hydro pneumatic circuits – use of microprocessors for sequencing – PLC- Low cost automation- robotic circuits.

Course outcomes:

Upon completion, the student should be able to:

- Define basic fluid power terms and units.
- Identify Hydraulic and Pneumatic graphic symbols.
- Describe fluid power components.
- Calculate basic operations for sizing hydraulic and pneumatic components.
- Perform basic fluid power maintenance procedures.

TEXT BOOKS:

1. Andrew Parr, “Hydraulics and Pneumatics”, (HB), Jaico Publishing House, 1999
2. Bolton. W. “Pneumatic and Hydraulic systems”, Butterworth – Heinemann, 1997

Head
Mechanical Engineering Department,
JNTUA College of Engineering,
PULIVENDULA - 516 390.

REFERENCES:

1. Antony Esposito, "Fluid power with Applications", prentice Hall, 1980
2. Dudley A. Pease and John J. Pippenger, "Basic fluid power", Prentice Hall, 1987

Web References:

1. <http://www.pneumatics.com>
2. <http://www.fluidpower.com.tw>

