JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

IV Year B.Tech. Mech. Engg. II-Sem.

INDUSTRIAL HYDRAULICS & PNEUMATICS
(DEPARTMENTAL ELECTIVE – II)

UNIT – I

Fundamentals of Fluid Power Systems-Introduction-types advantages, disadvantages & applications-fluid characteristics-terminologies used in fluid power-hydraulic symbols-hydraulic systems and components-sources-pumping theory-gear, vane & piston pumps.

UNIT-II

Fluid Power Actuators: Introduction-hydraulic actuators-hydraulic cylinders-types, construction, specifications and special types. Hydraulic motors-Working principle-selection criteria for various types-Hydraulic motors in circuits- Formulae-numerical problems

UNIT-III

Hydraulic elements in the design of circuits- Introduction-control elements-direction control valve-check valve-Pressure control valve-Relief valve-Throttle valve-Temperature & Pressure compensation-locations of flow control valve

UNIT-IV

Accumulators & Intensifiers-Types, size &function of accumulators-application & circuits of accumulators- Intensifiers-circuit & Applications.

UNIT-V

Design & drawing of hydraulic circuits-Introduction-case study & specifications-method of drawing a hydraulic circuit-hydraulic cylinder-quick return of a hydraulic cylinder

UNIT-VI

Pneumatic systems-Introduction-symbols used-concepts & components-comparision-types & specifications of compressors-arrangement of a complete pneumatic system-compressed air behaviour- understanding pneumatic circuits-direction control valves

UNIT-VII

Electro pneumatics- Introduction-Pilot operated solenoid valve-electrical

connections to solenoids-electro pneumatic circuit switches-relays-solenoids-P.E converter-concept of latching

UNIT-VIII

Applications-Servo systems-Introduction-closed loop, hydro-mechanical and electro hydraulic – conventional and proportional valves-characteristics of proportional and servo valves- PLC applications in fluid power – selected pneumatic / electro pneumatic circuit problems – failure and trouble shooting in fluid power systems.

TEXT BOOKS:

1. Introduction to Hydraulics and Pneumatics by S. Ilango and V. Soundararajan, PHI , New Delhi
2. Applied hydraulics and pneumatics-T. Sunder Selwyn & R. Jayendiran, Anuradha Publications.

REFERENCE BOOKS:

1. Oil Hydraulic Systems, S.R .Majumdar, McGrawHill Companies
2. Pneumatic Systems: Principles and Maintenance, Majumdar, McGrawHill