"PVC" NSSK G.P Bilaspur at Kalol	Department: -MECHANICAL ENGG. (4th Sem.)	Subject- H&P		
	Course -DIPLOMA	Duration -3 Years		
SYLLABUS COVERAGE	Total Periods-56	Theory -56		

Sr No	Period Nos	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	1-5	Introduction	Fluid, types of fluid; properties of fluid viz mass density, weight density (specific weight), specific volume, capillarity, specific gravity, viscosity, compressibility, surface tension, kinematic viscosity and dynamic viscosity and their units.	Fluid Mechanics by R.K BANSAL & Hydraulics & Pneumatics by Harpreet Singh		
2	6-14	Pressure and its Measurement	Concept of pressure (Atmospheric Pressure, gauge pressure, absolute pressure) Pressure measuring devices: piezometer tube manometers - simple U-tube, differential single column, inverted U-tube, micro manometer including simple problems. Bourdon pressure gauge, Diaphragm pressure gauge, dead weight pressure gauge , Concept of static pressure, Dalton's Law of partial pressure, Pascal's law, intensity of pressure and pressure head, Total pressure on a plane surface and centre of pressure..	---do-----		
3	15-24	Flow of Fluids	Types of fluid flow – steady and unsteady, uniform and non-uniform, laminar and turbulent; rate of flow and their units; continuity equation of flow; potential energy of a flowing fluid; total head; Bernoulli's theorem (statement and proof) and its applications. Discharge measurement with the help of venturi-meter, orifice meter, pitot-tube, limitations of Bernoulli's theorem, simple problems on measurement of flow.	---do-----		
4	25-30	Flow through Pipes	Definition of pipe flow, wetted perimeter, hydraulic mean depth, hydraulic gradient; loss of head due to friction; Chezy's equation and Darcy's equation of head loss (without proof), Reynolds's number and its effect on pipe friction. Loss of head in pipes due to sudden enlargement, sudden contraction, obstruction on flow path, change of direction and pipe fittings (without proof) including simple problems.			

5	31-38	**Hydraulic Machines**	Description, operation and application of hydraulic machines – hydraulic ram, hydraulic jack hydraulic brake, hydraulic accumulator, hydraulic door closer, hydraulic press, selection of specification of above machines for different applications.	---do-----		
6	39-47	**Hydro-Power, Water Turbines and Pumps**	Advantages of hydropower, basic elements, dams, head works. Concept of a turbine, types of turbines –impulse and reaction type (concept only), difference between them. Construction and working of pelton wheel, Francis turbine, Propeller and Kaplan turbines. Unit speed, unit power, unit discharge, specific speed of turbines, selection of turbines based on specific speed,Concept of hydraulic pump, single acting reciprocating pump (construction and operation only), vane, screw and gear pumps. Construction, working and operation of centrifugal pump. Performance, efficiencies and specifications of a centrifugal pump. Trouble shooting and problems in centrifugal pumps and remedial measures, pitting, cavitation, priming.	---do-----		
7	48-52	**Hydraulic Systems**	Basic components of hydraulic system, their symbols and function of each component in a hydraulic circuit. Industrial application of Hydraulic systems	---do-----		
8	53-56	**Pneumatic Systems**	Basic components – function of each component ,Air cylinder – types, function, single acting, double acting, rotating, non-rotating, piston type, diaphragm type, tandem cylinder, double ended cylinder, duplex cylinder with symbols Industrial application of Pneumatic systems	---do-----		

Approved	HOD Sign
Date	