**LESSON PLAN**

**NAME OF THE FACULTY: - Sh. Vipin Kumar**

**DISIPLANE: - ME**

**SAMESTER:- 4th**

**SUBJECT—H&P**

**Lesson Plan Duration:- 16 weeks**

**Work Load (Lecture/Practical) per week (In hours): Lecture 03, Practical -02**

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| Week | Theory | | Practical | |
|  | **Lecture Day** | **Topic (Including assignment/test)** | **Practical** | **Topic** |
|  |  |  |  |
| 1st | 1st | Fluid, types of fluid; | 1st | Measurement of pressure head by employing.  i) Piezometer tube  ii) Single and double column manometer |
| 2nd | properties of fluid viz mass density, weight density (specific  weight) |
| 3rd | specific volume, capillarity |
| 2nd | 4th | specific gravity, viscosity, compressibility | 2nd | Verification of Bernoulli’s theorem. |
| 5th | surface tension, kinematic viscosity and dynamic viscosity and their units |
| 6th | and dynamic viscosity and their units |
| 3rd | 7th | Concept of pressure (Atmospheric Pressure, gauge pressure, absolute  pressure), | 3rd | Determination of Coefficient of Discharge of venturimeter. |
| 8th | Pascal’s Law, Static Pressure |
| 9th | Pressure measuring devices: peizometer tube manometers |
| 4th | 10th | simple U-tube,  differential single column, | 4th | Determination of Coefficient of Discharge, coefficient of contraction and coefficient of velocity of Orifice meter. |
| 11th | inverted U-tube |
| 12th | micromanometer including  simple |
| 5th | 13th | Bourdon pressure gauge, Diaphragm pressure gauge, | 5th | Determination of coefficient of friction of flow through pipes((Darcy’s equation) |
| 14th | dead weight pressure  Gauge |
| 15th | Concept of Total pressure on immersed bodies, center of pressure, Simple problems on fluid properties and Manometers |
| 6th | 16th | Types of fluid flow – steady and unsteady, uniform and non-uniform, laminar and  turbulent; rate of flow and their units | 6th | Determination of minor losses of flow through pipes. (Chezy's Equation) |
| 17th | continuity equation of flow; potential energy  of a flowing fluid; |
| 18th | total head; Bernoulli’s theorem (statement and proof) and its  applications. |
| 7th | 19th | Discharge measurement with the help of venturi-meter, | 7th | To determine overall efficiency of a single stage centrifugal pump. |
| 20th | orifice meter,  pitot-tube, |
| 21 | limitations of Bernoulli’s theorem simple problems. |
| 8th | 22 | Definition of pipe flow, wetted perimeter, hydraulic mean depth, hydraulic  gradient; | 8th | Demo of working of Pelton wheel, Francis and Kaplan turbine with the help of working model. |
| 23 | loss of head due to friction; Chezy’s equation and Darcy’s  equation of head loss (without proof), |
| 24 | Reynold’s number and its effect on  pipe friction; |
| 9th | 25 | siphon, Nozzle - definition | 9th | Draw hydraulic circuit of any available machine or working model |
| 26 | velocity of liquid flowing through  the nozzle |
| 27 | power developed. Water hammer |
| 10th | 28 | anchor block,syphon, surge tank | 10th | Draw pneumatic circuit of any available machine or working model |
| 29 | Loss of head in pipes due to sudden enlargement |  |  |
| 30 | sudden contraction,  obstruction on flow path, change of direction |  |  |
| 11th | 31 | and pipe fittings (without  proof), Cc, Cv, Cd, flow through drowned |  |  |
| 32 | partially drowned orifices |  |  |
| 33 | time for emptying a  tank through a circular orifice |  |  |
| 12th | 34 | Impact of jet on fixed vertical and moving vertical flat plates, |  |  |
| 35 | Classification of hydraulic turbines, Selection of turbine on the basis of head and discharge available |  |  |
| 36 | Concept of a turbine, types of turbines –impulse and reaction type (concept only), difference between them, Construction and working of pelton wheel,  Francis turbine |  |  |
| 13th | 37 | Propeller and Kaplan turbines. Unit speed, unit power, unit  discharge, specific speed of turbines, selection of turbines based on specific speed |  |  |
| 38 | Description, operation and application of hydraulic systems – hydraulic ram, |  |  |
| 39 | hydraulic jack, hydraulic brake |  |  |
| 14th | 40 | hydraulic accumulator, hydraulic door closer |  |  |
| 41 | hydraulic press, selection of specification of above systems for different applications |  |  |
| 42 | Construction, working and operation of centrigual pump. Performance,  efficiencies and specifications of a centrifugal pump Trouble shooting and  problems in centrifugal pumps and remedial measures, pitting, cavitation,  priming. |  |  |
| 15th | 43 | Concept of hydraulic pump, single acting reciprocating pump (construction  and operation only), efficiency |  |  |
| 44 | Slip and cavitation |  |  |
| 16th | 45 | Introduction to oil power hydraulics and pneumatic system. Relative Merits and Demerits as oil power hydraulic and pneumatic system. Industrial applications of oil power hydraulic and pneumatic system. Basic components of hydraulic system, definition and functions of each component in a hydraulic circuit |  |  |
| 46 | Hydraulic oils- Classification and their properties. Seals and packing- classification of seals, sealing materials. Maintenance of hydraulic system: common faults in hydraulic system, simple visual checks of oil, causes of contamination, preventive measures |  |  |
| 47 | Basic Components of Pneumatic Systems , definition and functions of each component in a Pneumatic circuit. Necessity of Filter, Regulator and Regulator (FLR). Common problems in pneumatic systems. Maintenance schedule of pneumatic systems |  |  |

**Teacher Name VIPIN KUMAR**