* **GOVERNMENT POLYTECHNIC JAGATSINGHPUR**

MECHANICAL ENGINEERING DEPARTMENT LESSON PLAN

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| Discipline :-  **MECHANICAL** | Semester:-  **5TH** | Name of the Teaching Faculty  ARUPAM PRADHAN |
| Subject:- Hydraulic Machines &Industrial Fluid Power | No of Days/per Week Class **Allotted**  **:-04** | Semester :15 WEEKS |
| Course Code:  **TH3** |
| **Week** | **Class Day** | **Theory/ Practical Topics** |
| 1st | 1st | Definition of hydraulic turbine, classification of hydraulic turbines |
| 2nd | Construction and working principle of impulse turbine. |
| 3rd | Velocity diagram of moving blades, work done of impulse turbine. |
| 4th | derivation of various efficiencies of impulse turbine. |
| 2nd | 1st | Velocity diagram of moving blades, work done of Francis turbine. |
| 2nd | derivation of various efficiencies of Francisturbine. |
| 3rd | Velocity diagram of moving blades, work done of various efficiencies of Kaplanturbine |
| 4th | derivation of various efficiencies of Kaplanturbine |
| 3rd | 1st | Numerical |
| 2nd | Numerical |
| 3rd | Numerical |
| 4th | Distinguish between impulse turbine and reaction turbine. |
| 4th | 1st | Construction of centrifugal pumps |
| 2nd | working principle of centrifugal pumps |
| 3rd | work done and derivation of various efficiencies of centrifugal  pumps |
| 4th | Numerical |

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| 5th | 1st | Numerical |
| 2nd | Describe construction &amp; working of single acting  reciprocating pump |
| 3rd | Describe construction &amp; working of double acting  reciprocating pump. |
| 4th | Derive the formula foe power required to drive the pump (Single acting &amp; double acting) |
| 6th | 1st | Define slip.State positive &amp; negative slip &amp |
| 2nd | establish relation between slip & coefficient ofdischarge. |
| 3rd | numerical |
| 4th | numerical |
| 7th | 1st | Elements –filter-regulator |
| 2nd | lubrication unit |
| 3rd | Pressure control valves |
| 4th | Pressure relief valves |
| 8th | 1st | Pressure regulation valves |
| 2nd | Direction control valves |
| 3rd | 3/2DCV,5/2 DCV |
| 4th | 5/3DCV |
| 9th | 1st | Flow control valves |
| 2nd | Throttle valves |
| 3rd | ISO Symbols of pneumatic components |
| 4th | ISO Symbols of pneumatic components |
| 10th | 1st | Operation of double acting cylinder |
| 2nd | Operation of double acting cylinder |
|  | 3rd | Operation of double acting cylinder with metering in |
|  | 4th | Operation of double acting cylinder with metering out control |
| 11th | 1st | Hydraulic system, |
|  | 2nd | its merit and demerits |
|  | 3rd | Hydraulic accumulators |
|  | 4th | Pressure control valves |
| 12th | 1st | Pressure relief valves |
|  | 2nd | Pressure regulation valves |
|  | 3rd | Direction control valves |
|  | 4th | 3/2DCV,5/2 DCV |
| 13th | 1st | 5/3DCV |
|  | 2nd | Flow control valves |

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|  | 3rd | Flow control valves |
|  | 4th | Throttle valves |
| 14th | 1st | External gear pumps |
|  | 2nd | internal gear pumps |
|  | 3rd | Vane pump |
|  | 4th | Radial piston pumps |
| 15th | 1st | ISO Symbols for hydraulic components. |
|  | 2nd | Actuators |
|  | 3rd | Direct control of single acting cylinder Operation of double acting cylinder |
|  | 4th | Operation of double acting cylinder with metering in and metering out control  Comparison of hydraulic and pneumatic system |