**BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK**

**DEPARTMENT OF MECHANICAL ENGINEERING**



**LESSON PLAN**

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| SUBJECT: HYDRAULIC MACHINES &INDUSTRIAL FLUID POWER (TH 3) | ACCADEMIC SESSION: 2022-23 |
| FACULTY: Mr. B.R. ROUT | SEMESTER: 5TH |
|  | SEC: A |

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| H O D (Mechanical Engg.) |

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| **Discipline:**  **MECHANICAL Engineering** | **Semester: 5Th A** | | **Name of the teaching faculty:**  **B. R. ROUT** |
| **Subject:**  **HYDRAULIC MACHINES &INDUSTRIAL FLUID POWER** | **No. of Days/ per week class allotted: 04periods per week**  **Tue-1 period, Wed-1 period, Thu-1 period, Fri -1 period)** | | **Semester From Date: 15-09-2022 To Date: 22-12-2022**  **No. of weeks: 14 weeks** |
| **Week** | **Class Day** | **No of period available** | **Theory Topics** |
| 1ST | 15/09/2022 | 1 | 1.1 Definition and classification of hydraulic turbines |
| 16/09/2022 | 1 | 1.2 Construction of impulse turbine |
| 2nd | 20/09/2022 | 1 | 1.2 Working principle of impulse turbine |
| 21/09/2022 | 1 | 1.3 Velocity diagram of moving blades |
| 22/09/2022 | 1 | 1.3 Work done of impulse turbine |
| 23/09/2022 | 1 | 1.3 Derivation of various efficiencies of impulse turbine |
| 3rd | 27/09/2022 | 1 | 1.3 Numerical on above |
| 28/09/2022 | 1 | 1.4 Velocity diagram of moving blades and work done of Francis turbine |
| 29/09/2022 | 1 | 1.4 Derivation of various efficiencies of Francis turbine. |
| 30/09/2022 | 1 | 1.4 Numerical on above |
| 4th | 11/10/2022 | 1 | 1.5 Velocity diagram of moving blades and work done of Kaplan turbine |
| 12/10/2022 | 1 | 1.5 Derivation of various efficiencies of Kaplan turbine |
| 13/10/2022 | 1 | 1.6 Numerical on above |
| 14/10/2022 | 1 | 1.7 Distinguish between impulse turbine and reaction turbine |
| 5th | 18/10/2022 | 1 | 2.1 Construction and working principle of centrifugal pumps |
| 19/10/2022 | 1 | 2.2 work done of centrifugal pumps |
| 20/10/2022 | 1 | 2.2 Derivation of various efficiencies of centrifugal pumps |
| 21/10/2022 | 1 | 2.3 Numerical on above |
| 6th | 25/10/2022 | 1 | Monthly Class Test 1 |
| 26/10/2022 | 1 | 3.1 Describe construction &amp; working of single acting reciprocating pump |
| 27/10/2022 | 1 | 3.2 Describe construction &amp; working of double acting reciprocating pump |
| 28/10/2022 | 1 | 3.3 Derive the formula foe power required to drive the pump (Single acting) |
| 7TH | 01/11/2022 | 1 | 3.3 Derive the formula foe power required to drive the pump (double acting) |
| 02/11/2022 | 1 | 3.5 Define slip, State positive & negative slip |
| 03/11/2022 | 1 | 3.5 Establish relation between slip & coefficient of discharge |
| 04/11/2022 | 1 | 3.6 Solve numerical on above |
| `8TH | 09/11/2022 | 1 | 4.1Elements –filter-regulator-lubrication unit |
| 10/11/2022 | 1 | 4.2 Pressure control valves |
| 11/11/2022 | 1 | 4.2.1 Pressure relief valves, 4.2.2 Pressure regulation valves |
| 9TH | 15/11/2022 | 1 | 4.3 Direction control valves  4.3.1 3/2DCV,5/2 DCV,5/3DCV |
| 16/11/2022 | 1 | Internal Assessment |
| 17/11/2022 | 1 | Internal Assessment |
| 18/11/2022 | 1 | 4.3.2 Flow control valves, 4.3.3. Throttle valves |
| 10TH | 22/11/2022 | 1 | 4.4 ISO Symbols of pneumatic components |
| 23/11/2022 | 1 | 4.5. Pneumatic circuits  4 .5.1 Direct control of single acting cylinder |
| 24/11/2022 | 1 | 4.5.2 Operation of double acting cylinder |
| 25/11/2022 | 1 | 4.5.3 Operation of double acting cylinder with metering in and metering out control |
| 11TH | 29/11/2022 | 1 | 5.1 Hydraulic system, its merit and demerits |
| 30/11/2022 | 1 | 5.2 Hydraulic accumulators, 5.2.1 Pressure control valves |
| 01/12/2022 | 1 | 5.2.2 Pressure relief valves  5.2.3 Pressure regulation valves |
| 02/12/2022 | 1 | 5.3 Direction control valves  5.3.1 3/2DCV,5/2 DCV,5/3DCV |
| 12TH | 06/12/2022 | 1 | 5.3.2 Flow control valves, 5.3.3 Throttle valves |
| 07/12/2022 | 1 | 5.4 Fluid power pumps 5.4.1 External and internal gear pumps |
| 08/12/2022 | 1 | 5.4.2 Vane pump |
| 09/12/2022 | 1 | 5.4.3 Radial piston pumps |
| 13TH | 13/12/2022 | 1 | 5.5 ISO Symbols for hydraulic components |
| 14/12/2022 | 1 | 5.6 Actuators |
| 15/12/2022 | 1 | 5.7 Hydraulic circuits  5.7.1 Direct control of single acting cylinder |
| 16/12/2022 | 1 | Monthly Class Test 2 |
| 14TH | 20/12/2022 | 1 | 5.7.2 Operation of double acting cylinder |
| 21/12/2022 | 1 | 5.7.3 Operation of double acting cylinder with metering in and metering out control |
| 22/12/2022 | 1 | 5.8 Comparison of hydraulic and pneumatic system |