# BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK
## DEPARTMENT OF AUTOMOBILE ENGINEERING

**LESSON PLAN**

SUBJECT: **HYADROULIC &PNEUMATIC CONTROL**

FACULTY: **SUDHANSU SEKHAR SAHOO**

ACCADEMIC SESSION: **2022-23**

SEMESTER: **4TH**

Sd/-

H O D (Automobile Engg.)

Lecturer
Automobile Engg. Dept.
BOSE, Cuttack

## AUTOMOBILE ENGINEERING DEPATMENT

### VISSION:

To develop competent, disciplined imaginative Automobile engineers, equipped with core competency and technical skills useful to the learning / teaching community and the industrial fraternity.

### MISSION:

**M1:**To provide with operational and technical inputs to get innovative and research ideas in the field of automotive engineering.

**M2:** To give inputs for higher education with management qualities for the betterment of the society.

**M3:**Skilling with modern engineering tools necessary to meet and solve engineering problems.

### PROGRAM EDUCATIONAL OBJECTIVES

**PEO1:** To provide technical skills to diagnose and apply the concept of automotive system

**PEO2:** To prepare to design, fabricate and innovate in automobile sector to face the industrial challenges.

**PEO3:** To inculcate with good communication skills, ethics and entrepreneurship skills to play the key role in automotive industry.

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LESSON PLAN

| Discipline:-**Automob[illegible].** | Semester:-**4th** | Nameoftheteachingfaculty:- **SUDHANSU SEKHAR SAHOO** |
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| SubjectName:-**HYADROLIC &PNEUMATIC CONTROL** | No.OfDays/WeekClassAllotted :- **04 Periods/Week(Monday, Tuesday,Wednesday, Thursday )** | SemesterfromDate**14/02/2023**ToDate **23/05/2023No.of Weeks:15** |
| Week | DATE | THEORY TOPIC |
| 1st | 14/02/2023 | Introduction of **HYDRAULICS & PNEUMATIC CONTROL** |
| | 15/02/2023 | **1.0 Fluid Mechanics**<br>1.1 Fluid properties. |
| | 16/02/2023 | 1.1 Fluid properties. |
| 2nd | 20/02/2023 | Define fluid, description of fluid properties like Density |
| | 21/02/2023 | Dynamic viscosity, kinematic viscosity, surface tension Capillary phenomenon |
| | 22/02/2023 | Solve simple numerical |
| | 23/02/2023 | 1.2 Measurement of pressure |
| 3rd | 27/02/2023 | Concept of atmospheric pressure, gauge pressure, absolute pressure, pressure gauges- Piezometer tube |
| | 28/02/2023 | Concept of atmospheric pressure, gauge pressure, absolute pressure, pressure gauges- Piezometer tube |
| | 01/03/2023 | Simple & differential monometer, Micro Manometer (simple problems on manometers) Bourdon tube pressure gauge. |
| | 02/03/2023 | Solve simple numerical |
| 4th | 06/03/2023 | **2.0 Hydro dynamics.**<br>2.1 Law of continuity and its application. |
| | 09/03/2023 | 2.1 Law of continuity and its application. |
| 5th | 13/03/2023 | 2.2 Bernoulli's Theorem. |
| | 14/03/2023 | Energy possessed by the liquid in motion, Bernoulli's theorem and its applications such as venturi meter, |
| | 15/03/2023 | Orifice meter &pitot tube (Analytical treatment with derivation for measurement of discharge is expected.) |
| | 16/03/2023 | 2.3 Hydraulic Coefficients. |

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| 6th | 20/03/2023 | Concept of vena contract. Coefficient of contraction, |
| | 21/03/2023 | Coefficient of velocity, coefficient of discharge, relation between the hydraulic coefficients |
| | 22/03/2023 | 2.4 Types of fluid flow |
| | 23/03/2023 | Steady, unsteady, rotational, irrotational, laminar, turbulent, one, two & three dimensional flow, uniform & non uniform flow |
| 7th | 27/03/2023 | **CLASS TEST** |
| | 28/03/2023 | DISCUSSION |
| | 29/03/2023 | **3.0 Hydraulic Devices**<br>3.1 Simple Hydraulic devices.<br>Working principles, construction and applications of hydraulic jack, hydraulic Ram, hydraulic lift, hydraulic press. |
| 8th | 03/04/2023 | 3.1 Simple Hydraulic devices.<br>Working principles, construction and applications of hydraulic jack, hydraulic Ram, hydraulic lift, hydraulic press. |
| | 04/04/2023 | 3.2 Centrifugal Pumps.<br>Types, construction & working of centrifugal pump. Types of casing. Need of priming, Heads, Losses & efficiencies. |
| | 05/04/2023 | 3.2 Centrifugal Pumps.<br>Types, construction & working of centrifugal pump. Types of casing. Need of priming, Heads, Losses & efficiencies. |
| | 06/04/2023 | Centrifugal pump (NO analytical treatment). Net positive suction head, fault finding &remedies, pump selection. |
| 9th | 10/04/2023 | Centrifugal pump (NO analytical treatment). Net positive suction head, fault finding &remedies, pump selection. |
| | 11/04/2023 | 3.3 Reciprocating Pumps.<br>Constriction and working of single & double acting reciprocating pump, positive & negative slip. |
| | 12/04/2023 | Air vessels- their function & advantages. Power & |

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| | | efficiencies of reciprocating pump. Reasons of cavitations& separation |
| | 13/04/2023 | **4.0 Basic components of Hydraulic & Pneumatic systems.**<br>4.1 Hydraulic & Pneumatic system components |
| 10th | 17/04/2023 | 4.1 Hydraulic & Pneumatic system components |
| | 18/04/2023 | 4.2 Air Motors |
| | 19/04/2023 | 4.3 Hydraulic Actuator – single and double cylinder |
| | 20/04/2023 | 4.3 Hydraulic Actuator – single and double cylinder |
| 11th | 24/04/2023 | 4.4 Valves: Classification of valves, pressure control, directional control, sequencing, synchronizing and flow control valve. |
| | 25/04/2023 | 4.4 Valves: Classification of valves, pressure control, directional control, sequencing, synchronizing and flow control valve. |
| | 26/04/2023 | **5.0 Accessories of hydraulic & pneumatic circuit.**<br>5.1 Filters: Type, functions, construction. |
| | 27/04/2023 | 5.1 Filters: Type, functions, construction. |
| 12th | 01/05/2023 | 5.2 Hoses & connectors: Type, construction and applications. |
| | 02/05/2023 | 5.2 Hoses & connectors: Type, construction and applications. |
| | 03/05/2023 | 5.3 Seals and gaskets: Types, function, construction. |
| | 04/05/2023 | 5.3 Seals and gaskets: Types, function, construction. |
| 13th | 08/05/2023 | **6.0 Hydro Pneumatic Systems & Circuits**<br>6.1 Comparison of Hydraulic and Pneumatic circuits. |
| | 09/05/2023 | 6.1 Comparison of Hydraulic and Pneumatic circuits. |
| | 10/05/2023 | 6.2 Hydraulic Circuits: Meter in, Meter out, Bleed off, Sequencing, Applications of hydraulic circuits |
| | 11/05/2023 | 6.2 Hydraulic Circuits: Meter in, Meter out, Bleed off, Sequencing, Applications of hydraulic circuits |
| 14th | 15/05/2023 | 6.3 Simple Pneumatic Circuits. |

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| | 16/05/2023 | 6.3 Simple Pneumatic Circuits. |
| | 17/05/2023 | Speed Control Circuits, Sequencing circuits, Application of Pneumatic Circuit |
| | 18/05/2023 | Speed Control Circuits, Sequencing circuits, Application of Pneumatic Circuit |
| 15th | 22/05/2023 | CLASS TEST |
| | 23/05/2023 | DISCUSSION |
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