BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK

DEPARTMENT OF CIVIL ENGINEERING



LESSON PLAN

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| SUBJECT: HYDRAULICS & IRRIGATION ENGINEERING (TH 2) | ACCADEMIC SESSION: 2021-22 |
| FACULTY: MISS IPSITA THAKUR | SEMESTER: 4TH |
|  | SEC: C |

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| Sd/- |
| H O D (Civil Engg.) |

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| **Discipline:**  **Civil Engineering** | **Semester/ Section:**  **4TH/ C** | | **Name of the teaching faculty:**  **MISS IPSITA THAKUR** |
| **Subject:**  Th2. HYDRAULICS & IRRIGATION ENGINEERING | **No. of Days/ per week class allotted: 05period per week. (Tues 2 Period, Wed 1 Period, Fri 1 Period, & Sat 1 Period)** | | **Semester From Date: 10-03-2022 To Date: 10-06-2022**  **No. of weeks: 14** |
| **Week** | **Class Day** | **No of period available** | **Theory Topics** |
| **1st** | 11-03-2022 | 1 | **1 HYDROSTATICS:**1.1 Properties of fluid: density, specific gravity, viscosity. |
| 12-03-2022 | 1 | 1.1 surface tension, viscosity and their uses |
| **2nd** | 15-03-2022 | 2 | 1.2 Pressure and its measurements: intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure; relationship between atmospheric pressure, absolute pressure and gauge pressure. 1.2 pressure head; pressure gauges. |
| 16-03-222 | 1 | Problems on Pressure and its measurements. |
| **3rd** | 22-03-2022 | 2 | 1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface. Problems on Pressure exerted on an immersed surface |
| 23-03-2022 | 1 | **PART: B (Irrigation Engineering) 1 Hydrology-** 1.1 Hydrology Cycle 1.2 Rainfall: types, intensity, hyetograph. |
| 25-03-2022 | 1 | 1.3 Estimation of rainfall, rain gauges, itstypes (concept only), 1.4 Concept of catchment area, types, run-off, estimation of flood discharge by Dicken’s and Ryve’s formulae. |
| 26-03-2022 | 1 | **2 KINEMATICS OF FLUID FLOW: 2.1 Basic equation of fluid flow and their application:**Rate of discharge, equation of continuity of liquid flow. |
| **4th** | 29-03-2022 | 2 | 2.1 total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli’s theorem and its limitations. |
| 30-03-2022 | 1 | 2.1 Practical applications of Bernoulli’s equation. |
| 02-04-2022 | 1 | Class test 1 |
| **5th** | 05-04-2022 | 2 | Problems on 2.1 |
| 06-04-2022 | 1 | 2.2 Flow over Notches and Weirs: Notches, Weirs, types of notches and weirs, Discharge through different types of notches and weirs-their application. |
| 08-04-2022 | 1 | Problems on 2.2 |
| 09-04-2022 | 1 | 2.3 Types of flow through the pipes: uniform and non-uniform; laminar and turbulent; steady and unsteady; Reynold’s number and its application.  2.4 Losses of head of a liquid flowing through pipes: Different types of major and minor losses. Simple numerical problems on losses due to friction using Darcy’s equation, Total energy lines & hydraulic gradient lines. |
| **6th** | 12-04-2022 | 2 | 2.4 Losses of head of a liquid flowing through pipes: Different types of major and minor losses. Simple numerical problems on losses due to friction using Darcy’s equation, Total energy lines & hydraulic gradient lines. Problems on 2.4 |
| 13-04-2022 | 1 | Problems on 2.4 |
| 16-04-2022 | 1 | 2.5 Flow through the Open Channels: Types of channel sections-rectangular, trapezoidal and circular, discharge formulae- Chezy’s and Manning’s equation, Best economical section. |
| **7th** | 19-04-2022 | 2 | Problems on 2.5, **3 PUMPS:** 3.1 Type of pumps 3.2 Centrifugal pump: basic principles, operation, discharge, horse power & efficiency. |
| 20-04-2022 | 1 | 3.3 Reciprocating pumps: types, operation, discharge, horse power & efficiency. |
| 22-04-2022 | 1 | **2 Water Requirement of Crops** 2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation. |
| 23-04-2022 | 1 | 2.2 Crop season 2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops. |
| **8th** | 26-04-2022 | 2 | 2.4 Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio. **3 FLOW IRRIGATION** 3.1 Canal irrigation, types of canals, loss of water in canals. |
| 27-04-2022 | 1 | Class test 2 |
| 29-04-2022 | 1 | 3.1 Canal irrigation, types of canals, loss of water in canals. |
| 30-04-2022 | 1 | 3.2 Perennial irrigation. |
| **9th** | 04-05-2022 | 1 | 3.3 Different components of irrigation canals and their functions |
| 06-05-2022 | 1 | 3.4 Sketches of different canal cross-sections. |
| 07-05-2022 | 1 | 3.5 Classification of canals according to their alignment, Various types of canal lining . |
| **10th** | 10-05-2022 | 2 | Internal Assessment |
| 11-05-2022 | 1 | 3.5 Advantages and disadvantages. |
| 13-05-2022 | 1 | **4 WATER LOGGING AND DRAINAGE:** 4.1 Causes and effects of water logging, detection, prevention and remedies. |
| 14-05-2022 | 1 | 5 DIVERSION HEAD WORKS AND REGULATORY STRUCTURES 5.1 Necessity and objectives of diversion head works, weirs and barrages. |
| **11th** | 17-05-2022 | 2 | 5.2 General layout, functions of different parts of barrage. 5.3 Silting and scouring |
| 18-05-2022 | 1 | 5.4 Functions of regulatory structures. |
| 20-05-2022 | 1 | 6 CROSS DRAINAGE WORKS: 6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, superpassage, level crossing. |
| 21-05-2022 | 1 | 6.2 Concept of each with help of neat sketch. |
| **12th** | 24-05-2022 | 2 | **7 DAMS** 7.1 Necessity of storage reservoirs, types of dams, 7.2 Earthen dams: types, description, causes of failure and protection measures. |
| 25-05-2022 | 1 | 7.3 Gravity dam- types, description, Causes of failure and protection measures. |
| 27-05-2022 | 1 | 7.4 Spillways- Types (With Sketch) and necessity. |
| 28-05-2022 | 1 | Class test 3 |
| **13th** | 31-05-2022 | 2 | Revision |
| 01-06-2022 | 1 | Revision |
| 03-06-2022 | 1 | Revision |
| 04-06-2022 | 1 | Previous year question solving |
| **14th** | 07-06-2022 | 2 | Previous year question solving |
| 08-06-2022 | 1 | Previous year question solving |
| 10-06-2022 | 1 | Previous year question solving |