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: SRI KSHITISH KUMAR SAHOO | SEMESTER: 4TH  |
|  | SEC: B |

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

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| **Discipline:** **Civil Engineering** | **Semester/ Section:** **4TH/ B** | **Name of the teaching faculty:** **SRI KSHITISH KUMAR SAHOO** |
| **Subject:** Th2. HYDRAULICS & IRRIGATION ENGINEERING | **No. of Days/ per week class allotted: 05 period per week. (Mon,Tue, Thu, Fri, & Sat – 1 period each)** | **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 | 10-03-2022 | 1 | **1 HYDROSTATICS:**1.1 Properties of fluid: density, specific gravity, viscosity. |
| 11-03-2022 | 1 | 1.1 surface tension, viscosity and their uses |
| 12-03-2022 | 1 | Problems on Properties of fluid |
| 2nd | 14-03-2022 | 1 | 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. |
| 15-03-222 | 1 | 1.2 pressure head; pressure gauges. |
| 17-03-2022 | 1 | Problems on Pressure and its measurements. |
| 3rd | 21-03-2022 | 1 | 1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface. |
| 22-03-2022 | 1 | Problems on Pressure exerted on an immersed surface |
| 24-03-2022 | 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 | 28-03-2022 | 1 | 2.1 total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli’s theorem and its limitations. |
| 29-03-2022 | 1 | 2.1 Practical applications of Bernoulli’s equation. |
| 31-03-2022 | 1 | Class test 1 |
| 02-04-2022 | 1 | Problems on 2.1 |
| 5th | 04-04-2022 | 1 | Problems on 2.1 |
| 05-04-2022 | 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. |
| 07-04-2022 | 1 | Problems on 2.2 |
| 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 | 11-04-2022 | 1 | 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. |
| 12-04-2022 | 1 | Problems on 2.4 |
| 16-04-2022 | 1 | Problems on 2.4 |
| 7TH | 18-04-2022 | 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. |
| 19-04-2022 | 1 | Problems on 2.5 |
| 21-04-2022 | 1 | **3 PUMPS:** 3.1 Type of pumps 3.2 Centrifugal pump: basic principles, operation, discharge, horse power & efficiency. |
| 22-04-2022 | 1 | 3.3 Reciprocating pumps: types, operation, discharge, horse power & efficiency. |
| 23-04-2022 | 1 | **2 Water Requirement of Crops** 2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation. |
| 8TH | 25-04-2022 | 1 | 2.2 Crop season 2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops. |
| 26-04-2022 | 1 | 2.4 Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio. |
| 28-04-2022 | 1 | Class test 2 |
| 29-04-2022 | 1 | **3 FLOW IRRIGATION** 3.1 Canal irrigation, types of canals, loss of water in canals. |
| 30-04-2022 | 1 | 3.1 Canal irrigation, types of canals, loss of water in canals. |
| 9TH | 02-05-2022 | 1 | 3.2 Perennial irrigation. |
| 05-05-2022 | 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 | 09-05-2022 | 1 | Internal Assessment  |
| 10-05-2022 | 1 | Internal Assessment |
| 12-05-2022 | 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 | 1 | 5.2 General layout, functions of different parts of barrage. |
| 19-05-2022 | 1 | 5.3 Silting and scouring  |
| 20-05-2022 | 1 | 5.4 Functions of regulatory structures. |
| 21-05-2022 | 1 | 6 CROSS DRAINAGE WORKS: 6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, superpassage, level crossing. |
| 12TH | 23-05-2022 | 1 | 6.2 Concept of each with help of neat sketch. |
| 24-05-2022 | 1 | **7 DAMS** 7.1 Necessity of storage reservoirs, types of dams |
| 26-05-2022 | 1 | 7.2 Earthen dams: types, description, causes of failure and protection measures. |
| 27-05-2022 | 1 | 7.3 Gravity dam- types, description, Causes of failure and protection measures. |
| 28-05-2022 | 1 | 7.4 Spillways- Types (With Sketch) and necessity. |
| 13TH | 31-05-2022 | 1 | Class test 3 |
| 02-06-2022 | 1 | Revision |
| 03-06-2022 | 1 | Revision |
| 04-06-2022 | 1 | Revision |
| 14TH | 06-06-2022 | 1 | Previous year question solving |
| 07-06-2022 | 1 | Previous year question solving |
| 09-06-2022 | 1 | Previous year question solving |
| 10-06-2022 | 1 | Previous year question solving |