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: SANDHYARANI BARIK | SEMESTER: 3 RD |
|  | SEC: A |

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| H O D (Civil Engg.) |

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| **Discipline:**  **Civil Engineering** | **Semester:4th A** | | **Name of Teaching Faculty:**  **SANDHYARANI BARIK** |
| **Subject:**  **Th-2(Hydraulics & Irrigation Engineering)** | **No. of Days / week class allotted: 05 period per week ( Tue -2period,Wed-2 period,**  **Fri-- 1 Period )** | | **Semester From Date : 10-03-2022 To Date 10-06-2022**  **No. of Weeks: 14** |
| **Week** | **Date** | **No. of periods available** | **Topics to be covered** |
| 1st | 11/03/2022 | 1 | **PART :A (Hydraulics)**  **1.HYDROSTATICS:**  1.1 Properties of fluid: Density, specific gravity, surface tension |
| 2nd | 15/03/2022 | 2 | 1.1 Capillarity, Viscosity and their uses |
| 16/03/2022 | 2 | 1.2 Pressure and its measurement: Intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure, relationship between atmospheric pressure, gauge pressure and absolute pressure |
| 3rd | 22/03/2022 | 2 | 1.2 Pressure head and pressure gauges |
| 23/03/2022 | 2 | 1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure |
| 25/03/2022 | 1 | 1.3 expression for total pressure exerted on horizontal and vertical surface |
| 4th | 29/03/2022 | 2 | **2. KINEMATICS OF FLUID FLOW:** 2.1Basic equation of fid flow ad their applications: Rate of discharge, equation of continuity of liquid flow, Total energy of a liquid in motion –Potential, kinetic and pressure |
| 30/03/2022 | 2 | MONTHLY TEST 1 |
| 5th | 05/04/2022 | 2 | 2.1 Bernoulli’s theorem and its limitations practical application of Bernoulli’s equation. |
| 06/04/2022 | 2 | 2.2 Flow over notches and weirs: notches, weirs, types of notches and weirs, Discharge through different types of notches and weirs –their applications. |
| 08/04/2022 | 1 | 2.3Types of flow through pipes: Uniform and non uniform; laminar and turbulent; steady and unsteady; Reynolds number and its applications  2.4 Losses of heads of liquid flowing throw pipes: Different types of major and minor losses |
| 6th | 12/04/2022 | 2 | 2.4 Simple numerical problems on losses due to friction using Darcy’s equation, Total energy lines and hydraulic gradient lines |
| 13/04/2022 | 2 | 2.5 Flow through open channels: Types of channel cross sections-Rectangular trapezoidal and circular, Discharge formula Chezy’s and manning’s equation |
| 7TH | 19/04/2022 | 2 | 2.5 Best economical section |
| 20/04/2022 | 2 | **PART- B(Irrigation engineering)**  **1 HYDROLOGY**  1.1Hydrology cycle  1.2Rainfall:Types, Intensity, hyetograph  1.3 Estimation of rainfall, rain gauges, its types |
| 22/04/2022 | 1 | 1.4 Concept of catchment area, types, runoff, estimation of flood discharge by dickens and Ryve’s formula |
| 8TH | 26/04/2022 | 2 | **2. WATER REQUIREMENT OF CROPS:**  2.1Defination of irrigation, Necessity, benefits of irrigation, types of irrigation  2.2Crop season  2.3 Duty, delta and base period and their relationship, overlap allowances. Kharif as Rabi crops |
| 27/04/2022 | 2 | 2.4 Gross command area, culturable command area, intensity of irrigation, Irrigable area, Time factor, crop ratio  **3. FLOW IRRGATION:**  3.1 Canal irrigation, types of canals, loss of water in canals |
| 29/04/2022 | 1 | 2nd class Test |
| 9TH | 04/05/2022 | 2 | 3.2Perenial irrigation  3.3 Different components of irrigation canal and their function 3.4 Sketches of different canal cross sections |
| 06/05/2022 | 1 | .5 Classifications of canals according to their alignment, various types of canal lining-advantages and disadvantages |
| 10TH | 10/05/2022 | 2 | **INTERNAL ASSESMENT** |
| 11/05/2022 | 2 | **4. WATER LOGGING AND DRAINAGE:**  4.1 Causes and effect of Water logging, detection, prevention and remedies |
| 13/05/2022 | 1 | **5. DIVERSION HEAD WORK AND REGULATORY STRUCTURE:**  5.1 Necessity and objective of diversion head work, weirs and barrages |
| 11TH | 17/05/2022 | 2 | 5.2General layout, function different part of barrage  5.3 Silting and scouring  5.4 Function of regulatory structures |
| 18/05/2022 | 2 | **6 .CROSS DRAINAGE WORK:**  6.1 Function and necessity of Cross drainage works-aqueduct |
| 20/05/2022 | 1 | 6.1 Siphon, super passage, level crossing |
| 12TH | 24/05/2022 | 2 | 6.2 Concept of each with help of neat sketch |
| 25/05/2022 | 2 | **7. DAMS:**  7.1Necssity of storage reservoirs, types of dams |
| 27/05/2022 | 1 | CLASS TEST-3 |
| 13TH | 31/05/2022 | 2 | 7.2 Earthen dams: Types description, causes failure and protection measures  7.3 Gravity dams: Types description, causes failure and protection measures |
| 01/06/2022 | 2 | 7.4 Spill ways-types (with sketches) and necessity  **PART-A**  **3. PUMPS:**  3.1 types of pumps |
| 03/06/2022 | 1 | 3.2 Centrifugal pumps: Basic principles, operation, Centrifugal pumps: discharge, horse power and efficiency  3.3 Reciprocating pumps: types, operation, discharge, horse power and efficiency |
| 14TH | 07/06/2022 | 2 | REVISION |
| 08/06/2022 | 2 | REVISION |
| 10/06/2022 | 1 | PREVIOUS YEAR QUESTION DISCUSSION |