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**JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA**  
**DEPARTMENT OF CIVIL ENGINEERING**  
**LESSON PLAN**  
**PROGRAMME: DIPLOMA IN CIVIL ENGINEERING**

**SUBJECT: HYDRAULIC & IRRIGATION ENGINEERING**, *Course code - Th-2*  
**NAME OF THE FACULTY: SRI AMIT KUMAR SAHU**  
**MRS DEEPANJALI SETHI**

**SEMESTER: 6<sup>th</sup> Ph.**

| CHAPTER | WEEK NO. | CLASS DAY | LECTURE NO. | TOPICS TO BE COVERED  |
|---------|----------|-----------|-------------|---|
| 1       | W1       | 1         | 1           | <b>HYDROSTATICS:</b>  |
|         |          | 2         | 2           | <b>1.1 Properties Of Fluid</b> :Density, Specific Gravity, Surface Tension, Capillarity, Viscosity And Their Uses |
|         |          | 3         | 3           | Problem Practice  |
|         |          | 4         | 4           | Revision  |
|         | W2       | 5         | 5           | <b>1.2 Pressure and its measurements:</b> Intensity Of Pressure, Atmospheric Pressure                             |
|         |          | 6         | 6           | Gauge Pressure, Absolute Pressure And Vacuum Pressure;  |
|         |          | 7         | 7           | Problem Practice  |
|         |          | 8         | 8           | Relationship Between Atmospheric Pressure, Absolute Pressure And Gauge Pressure;                                  |
|         |          | 9         | 9           | pressure head; pressure gauges, Problem practice  |

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| CHAPTER | WEEK NO. | CLASS DAY | LECTURE NO. | TOPICSTOBECOVERED   |
|---------|----------|-----------|-------------|---|
| 3       | W6       | 24        | 24          | <b>2.3 Types Of Flow Through The Pipes:</b><br>Uniform And Non Uniform Flow,Laminar And Turbulent; Flow   |
|         |          | 25        | 25          | Steady And Unsteady Flow; Reynolds's Number   |
|         |          | 26        | 26          | <b>2.4 Losses Of Head Of A Liquid Flowing Through Pipes:</b><br>Different types of major and minor losses.  |
|         |          | 27        | 27          | Darcy's equation,problems on losses due to friction   |
|         |          | 28        | 28          | Total energy lines & hydraulic gradient lines   |
|         | W7       | 29        | 29          | <b>2.5 Flow through the Open Channels:</b><br>Types of channel sections-rectangular, trapezoidal and circular,<br>Discharge Formulae- Chezy'sAnd Manning's Equation |
|         |          | 31        | 31          | <b>3.1 Type of pumps</b>  |
|         |          | 32        | 32          | <b>3.2 Centrifugal pump:</b><br>Basic Principles, Operation, Discharge,   |
|         |          | 33        | 33          | <b>3.3 Reciprocating pumps:</b><br>Types, Operation, Discharge,   |
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| CHAPTER | WEEK NO. | CLASS DAY | LECTURE NO. | TOPICSTOBECOVERED  |
|---------|----------|-----------|-------------|--|
| 1       | W8       |           |             | <b>B.IRRIGATION ENGINEERING</b>  |
|         |          | 34        | 34          | 1.1 Hydrology Cycle  |
|         |          | 35        | 35          | 1.2 Rainfall: Types, Intensity, Hyetograph   |
|         |          | 36        | 36          | 1.3 Estimation Of Rainfall, Rain Gauges, Its Types   |
|         |          | 37        | 37          | 1.4 Concept Of Catchment Area, Types,  |
|         |          | 38        | 38          | Run-Off, Estimation Of Flood Discharge By Dicken's And Ryve's Formulae                                       |
| 2.      | W9       | 39        | 39          | <b>Water Requirement Of Crops</b><br>2.1 Definition , Necessity, Benefits Of Irrigation, Types Of Irrigation |
|         |          | 40        | 40          | Types Of Irrigation  |
|         |          | 41        | 41          | 2.2 Crop Season  |
|         |          | 42        | 42          | 2.3 Duty, Delta And Base Period Their Relationship, Kharif And Rabi Crops                                    |
|         |          | 43        | 43          | 2.4 GCA, CCA, Intensity Of Irrigation, , Time Factor, Crop Ratio   |

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| CHAPTER | WEEK NO. | CLASS DAY | LECTURE NO. | TOPICS TO BE COVERED  |
|---------|----------|-----------|-------------|---|
| 3       | W10      | 44        | 44          | <b>Flow Irrigation</b>  |
|         |          | 45        | 45          | 3.1 Canal Irrigation, Types Of Canals,<br>loss of water in canals                             |
|         |          | 46        | 46          | 3.2 Perennial Irrigation  |
|         |          | 47        | 47          | 3.3 Irrigation Canals And Their Functions   |
|         |          | 48        | 48          | 3.4 Canal Cross-Sections  |
| 4       | W11      | 49        | 49          | 3.5 Classification Of Canals  |
|         |          | 50        | 50          | Various Types Of Canal Lining   |
|         |          | 51        | 51          | Advantages and disadvantages Canal Lining   |
|         |          | 52        | 52          | <b>WATER LOGGING AND DRAINAGE :</b>   |
|         |          | 53        | 53          | 4.1 Causes and effects of water logging<br>Detection, prevention an remedies of water logging |

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| CHAPTER | WEEK NO. | CLASS DAY | LECTURE NO. | TOPICSTOBECOVERED  |
|---------|----------|-----------|-------------|--|
| 5.      | W12      | 54        | 54          | <b>Diversion Head Works</b><br>5.1 Necessity And Objectives          |
|         |          | 55        | 55          | 5.2 Weirs And Barrages   |
|         |          | 56        | 56          | 5.3 Silting And Scouring   |
|         |          | 57        | 57          | 5.4 Functions Of Regulatory Structures                               |
| 6.      | W13      | 58        | 58          | <b>CROSS DRAINAGE WORKS:</b><br>6.1 Functions And Necessity Aqueduct |
|         |          | 59        | 59          | Functions And Necessity Super passage,                               |
|         |          | 60        | 60          | Functions And Necessity Level Crossing                               |
|         |          | 61        | 61          | Functions And Necessity Siphon,                                      |
|         |          | 62        | 62          | 6.2 Neat Sketch Super passage, Level Crossing, Siphon, Aqueduct      |

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| CHAPTER | WEEK NO. | CLASS DAY | LECTURE NO. | TOPICSTOBECOVERED   |
|---------|----------|-----------|-------------|---|
| 7.      | W14      | 63        | 63          | <b>DAMS</b>   |
|         |          | 64        | 64          | 7.1 Necessity Of Storage Reservoirs, Types Of Dams<br>Types Of Dams |
|         |          | 65        | 65          | 7.2 Earthen Dams: Types, Description                                |
|         |          | 66        | 66          | Causes Of Failure And Protection Measures.                          |
|         |          | 67        | 67          | 7.3 Gravity Dam- Types, Description,                                |
|         | W15      | 68        | 68          | Causes Of Failure And Protection Measures.                          |
|         |          | 69        | 69          | 7.4 Spillways- Types And Necessity.                                 |
|         |          | 70        | 70          | PYQ   |
|         |          | 71        | 71          | PYQ   |
|         |          | 72        | 72          | Revision  |

  
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