# COURSE DELIVERY PLAN

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| DEPARTMENT OF  CIVIL ENGINEERING | | | | T P C  Date Rev.No | : 0  : 0  : 3  : 29-7-2023  :00 |
| Course Regulation Course Code Course Name | : CE  : R-20  : 20CE4C3A  : DESIGN AND DRAWING OF IRRIGATION STRUCTURES | | |
| **Class** | **Course Coordinator** | **Section** | **Name of the Faculty** | | |
| IV B. TECH- I SEM | CH.SAI KIRAN | CE-A | Mrs. V.BHARGAVI | | |
| CE-B |  | | |
|  |  | | |

**COURSE OUTCOMES:**

**After successful completion of the course, the student will be able to,**

**CO1: Design** and draw Surplus weir. **(K5)**

**CO2: Design** and draw Tank sluice with a tower head. **(K5)**

**CO3: Design** and draw Canal drop-Notch type. **(K5)**

**CO4: Design** and draw Canal regulator. **(K5)**

**CO5: Design** and draw Syphon aqueduct type III. **(K5)**

**Bridge Course**

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| --- | --- |
| **S. No.** | **Topic Discussed** |
| **1** | Description about surplus weir, tank sluice, canal drop, canal regulator and  syphon aqueduct. |
| **2** | Usage and components of surplus weir, tank sluice, canal drop, canal regulator and  syphon aqueduct. |

**UNIT I:**  **Design and Drawing of Surplus weir**

# Objective:

The students are to be familiarized with hydraulic design principles of Surplus weir.

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| **Session No** | **Topics to be Covered** | **Reference** | **Teaching Aids/Class**  **Methods** |
| 1 | Estimation of Flood Discharge | TB1 : Chapter-4  Page no:47 | BB, Chalk, Duster |
| 2 | Selection of type of work | TB1 : Chapter-4  Page no:48 | BB, Chalk, Duster |
| 3 | Problem on design of surplus weir | TB1 : Chapter-4  Page no:48 | BB,Chalk,Duster |
| 4 | Calculation of length of weir | TB1 : Chapter-4  Page no:48 | BB,Chalk,Duster |
| 5 | Calculation of crest width and base width of weir | TB1 : Chapter-4  Page no:48 | BB,Chalk,Duster |
| 6 | Abutments | IS456-2000 | BB, Chalk, Duster |
| 7 | Returns. | TB1 : Chapter-4  Page no:50 | BB, Chalk, Duster |
| 8 | Aprons of weir | TB1 : Chapter-4  Page no:50-51 | BB, Chalk, Duster |
| 9 | Drawing of plan of surplus weir | TB1 : Plate 1 | PPT, Drawing Sheet |
| 10 | Drawing of plan of surplus weir | TB1 : Plate 1 | PPT, Drawing Sheet |
| 11 | Drawing of longitudinal section of surplus weir | TB1 : Plate 1 | PPT, Drawing Sheet |
| 12 | Drawing of longitudinal section of surplus weir | TB1 : Plate 1 | Drawing Sheet |
| 13 | Drawing of cross section of surplus weir | TB1 : Plate 1 | Drawing Sheet |
| 14 | Drawing of cross section of surplus weir | TB1 : Plate 1 | PPT, Drawing Sheet |
| 15 | Drawing of elevation of surplus weir | TB1 : Plate 1 | PPT, Drawing Sheet |
| 16 | Drawing of elevation of surplus weir | TB1 : Plate 1 | PPT, Drawing Sheet |
| 17 | Assignment |  |  |
| 18 | Slip Test |  |  |

**UNIT II:** **Design and Drawing of Tank sluice with tower head**

**Objective:**

The students are to be familiarized with hydraulic design principles of Tank sluice with tower head.

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| **Session No** | **Topics to be Covered** | **Reference** | **Teaching Aids/Class**  **Methods** |
| 19 | Design: vent way | TB1 : Chapter-8  Page no:61 | BB, Chalk, Duster |
| 20 | Sluice barrel | TB1 : Chapter-8  Page no:61 | BB, Chalk, Duster |
| 21 | R.C. Slab design | TB1 : Chapter-8  Page no:61-62 | BB,Chalk,Duster |
| 22 | Side walls and Earth pressure | TB1 : Chapter-8  Page no:62-63 | BB,Chalk,Duster |
| 23 | Stability Analysis | TB1 : Chapter-8  Page no:63 | BB,Chalk,Duster |
| 24 | Tower Head | TB1 : Chapter-8  Page no:64 | BB, Chalk, Duster |
| 25 | Drawing of plan of tank sluice | TB1 : Plate 3 | PPT, Drawing Sheet |
| 26 | Drawing of plan of tank sluice | TB1 : Plate 3 | PPT, Drawing Sheet |
| 27 | Drawing of longitudinal section of tank sluice | TB1 : Plate 3 | PPT, Drawing Sheet |
| 28 | Drawing of longitudinal section of tank sluice | TB1 : Plate 3 | Drawing Sheet |
| 29 | Drawing of cross section of tank sluice | TB1 : Plate 3 | Drawing Sheet |
| 30 | Drawing of cross section of tank sluice | TB1 : Plate 3 | PPT, Drawing Sheet |
| 31 | Assignment |  |  |
| 32 | Slip Test |  |  |

**UNIT III:** **Design and Drawing of Canal Drop –Notch type**

**Objective:**

The students are to be familiarized with hydraulic design principles of Canal Drop –Notch type.

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| **Session No** | **Topics to be Covered** | **Reference** | **Teaching Aids/Class**  **Methods** |
| 33 | Design: Trepezoidal Notch | TB1 : Chapter-12  Page no:75 | BB, Chalk, Duster |
| 34 | Length and profile of drop wall | TB1 : Chapter-12  Page no:76 | BB, Chalk, Duster |
| 35 | Notches and the Notch pier | TB1 : Chapter-12  Page no:77 | BB,Chalk,Duster |
| 36 | Protective works | TB1 : Chapter-12  Page no:77-78 | BB,Chalk,Duster |
| 37 | Length of revetments and bed pitching | TB1 : Chapter-12  Page no:78 | BB,Chalk,Duster |
| 38 | Specifications for foundation and solid apron | TB1 : Chapter-12  Page no:78-79 | BB, Chalk, Duster |
| 39 | Drawing of plan of canal drop | TB1 : Plate 4 | PPT, Drawing Sheet |
| 40 | Drawing of plan of canal drop | TB1 : Plate 4 | PPT, Drawing Sheet |
| 41 | Drawing of longitudinal section of canal drop | TB1 : Plate 4 | PPT, Drawing Sheet |
| 42 | Drawing of longitudinal section of canal drop | TB1 : Plate 4 | Drawing Sheet |
| 43 | Drawing of cross section of canal drop | TB1 : Plate 4 | Drawing Sheet |
| 44 | Drawing of cross section of canal drop | TB1 : Plate 4 | PPT, Drawing Sheet |
| 45 | Assignment |  |  |
| 46 | Slip Test |  |  |

**UNIT IV:** **Design and Drawing of Canal Regulator**

**Objective:**

The students are to be familiarized with hydraulic design principles of Canal Regulator.

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| **Session No** | **Topics to be Covered** | **Reference** | **Teaching Aids/Class**  **Methods** |
| 47 | About canal regulator | TB1 : Chapter-14  Page no:91 | PPT |
| 48 | Design: discharge | TB1 : Chapter-14  Page no:91 | BB, Chalk, Duster |
| 49 | Vent way of the regulator | TB1 : Chapter-14  Page no:91-92 | BB,Chalk,Duster |
| 50 | Road way | TB1 : Chapter-14  Page no:92-93 | BB,Chalk,Duster |
| 51 | Length of pier and shutters | TB1 : Chapter-14  Page no:93 | BB,Chalk,Duster |
| 52 | Loads and abutments | TB1 : Chapter-14  Page no:94 | BB, Chalk, Duster |
| 53 | Wing walls and returns | TB1 : Chapter-14  Page no:95-96 | BB, Chalk, Duster |
| 54 | specifications | TB1 : Chapter-14  Page no:96 | BB, Chalk, Duster |
| 55 | Drawing of plan and longitudinal section of canal regulator | TB1 : Plate 7 | PPT, Drawing Sheet |
| 56 | Drawing of plan and longitudinal section of canal regulator | TB1 : Plate 7 | Drawing Sheet |
| 57 | Drawing of cross section of canal regulator | TB1 : Plate 7 | Drawing Sheet |
| 58 | Drawing of cross section of canal regulator | TB1 : Plate 7 | Drawing Sheet |
| 59 | Assignment |  |  |
| 60 | Slip Test |  |  |

**UNIT V:** **Design and Drawing of Syphon Aqueduct Type III**

**Objective:**

The students are to be familiarized with hydraulic design principles of Syphon Aqueduct Type III.

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| **Session No** | **Topics to be Covered** | **Reference** | **Teaching Aids/Class**  **Methods** |
| 61 | Design: Loss of head | TB1 : Chapter-18  Page no:112-113 | BB, Chalk, Duster |
| 62 | Drainage water way | TB1 : Chapter-18  Page no:114 | BB, Chalk, Duster |
| 63 | R.C.Side walls | TB1 : Chapter-18  Page no:114 | BB,Chalk,Duster |
| 64 | Road way | TB1 : Chapter-14  Page no:114 | BB,Chalk,Duster |
| 65 | Bottom slab and fixing MFL | TB1 : Chapter-18  Page no:115 | BB,Chalk,Duster |
| 66 | Tail channel and afflux on the drop wall | TB1 : Chapter-18  Page no:116 | BB, Chalk, Duster |
| 67 | Foundation of abutment and piers | TB1 : Chapter-18  Page no:117-118 | BB, Chalk, Duster |
| 68 | Canal transitions | TB1 : Chapter-18  Page no:118-119 | BB, Chalk, Duster |
| 69 | Causes for failure of cross drainage works | TB1 : Chapter-18  Page no:120-121 | PPT |
| 70 | Drawing of plan and longitudinal section of syphon aqueduct | TB1 : Plate 10 | Drawing Sheet |
| 71 | Drawing of cross section of syphon aqueduct | TB1 : Plate 10 | Drawing Sheet |
| 72 | Drawing of cross section of syphon aqueduct | TB1 : Plate 10 | Drawing Sheet |
| 73 | Assignment |  |  |
| 74 | Slip Test |  |  |

Session Duration: 50 Minutes

**Total No. of Sessions required: 74**

**COURSE OUTCOMES**

Student should be able to,

|  |  |  |  |
| --- | --- | --- | --- |
| **CO1** | **Design** and draw Surplus weir. | **Design** | K5 |
| **CO2** | **Design** and draw Tank sluice with a tower head. | **Design** | K5 |
| **CO3** | **Design** and draw Canal drop-Notch type. | **Design** | K5 |
| **CO4** | **Design** and draw canal regulator. | **Design** | K5 |
| **CO5** | **Design** and draw Syphon Aqueduct Type III. | **Design** | K5 |

**PROGRAM OUTCOMES**

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| --- | --- | --- | --- |
| S. No | Graduate Attributes | Action Verbs | Level |
| 1 | Engineering Knowledge | Apply | K3 |
| 2 | Problem Analysis | Analyze | K4 |
| 3 | Design Development Of Solutions | Evaluate | K5 |
| 4 | Investigation Of Complex Problems | Evaluate | K5 |
| 5 | Modern Tool Usage | Create | K6,K5,K3 |
| 6 | Engineer and Society |  |  |
| 7 | Environment and Sustainability |  |  |
| 8 | Ethics |  |  |
| 9 | Individuals and Team Work |  |  |
| 10 | Communication |  |  |
| 11 | Life Long Learning |  |  |
| 12 | Project Management and Finance |  |  |

**PROGRAM SPECIFIC OUTCOMES**

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| **PSO1** | Graduates will have an ability to design components of diverse civil structures like buildings, roads, bridges, hydraulic structures etc.(K6,K5,K3) |
| **PSO2** | Graduates will have an ability to understand the materials and processes involved in various domains of civil engineering using codes of practices. (K4,K3) |

**Mapping of CO-PO-PSO**

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|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - |

1: Weekly Mapped 2: Medium Mapped 3: Strongly Mapped

# REFERENCES:

**TEXT BOOKS:**

1. Water Resources Engineering – Principles and Practice by C. Satyanarayana Murthy,

New age International Publishers.

**REFERENCE BOOKS:**

1. Irrigation Engineering and Hydraulic Structures by S.K. Garg, Standard Book House.

2. Irrigation and Water Power Engineering by B.C Punmia & Lal, Lakshmi Publications

pvt. Ltd., New Delhi.

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| --- | --- | --- | --- |
| Prepared By | Signatures | Approved By | Signature |
| V.Bhargavi |  | HOD |  |
|  |  |
|  |  | PRINCIPAL |  |