

MEHRAN UNIUVERSITY OF ENGINEERING AND TECHNOLOGY

FRM-001/00QSP-004

Dec.01.2001



TENTATIVE TEACHING PLAN

DEPARTMENT/INSTITUTE/DIRECTORATE: CIVIL ENGINEERING

Department: Civil Engineering

Name of Teacher: Engr. Hafiz Usama Imad

Subject: Fluid Mechanics & Hydraulics Course Code: CE227

Batch: 22CE (D) Year: 2nd Semester: 3rd

Semester Starting Date: 20-11-2023 Semester Suspension Date: 29-03-2024

Course Learning Outcomes (CLOs): Upon successful completion of the course, the student will be able to:

| CLO No. | Description | Taxonomy Level | Linking to PLOs |
|------------|--|-------------------|--------------------|
| 1 | DESCRIBE the concepts related to fluid statics, kinematics, dynamics and simulation model of a real hydraulic structure. | C2 | 1 |
| 2 | SOLVE problems related to various open channel x-sections and flow based on hydraulic energy & momentum principles. | C3 | 2 |

| S. # | TOPICS | CLO | No. of Lecture Required |
|---------------------|--|-----|-------------------------------|
| Properties of Fluid | | | |
| 1. | Introduction of the subject | 1 | 1 |
| 2. | Dimensions and system of Units | 1 | 1 |
| 3. | Properties of Fluid | 1 | 2 |
| 4. | Problems on Properties of fluid | 1 | 1 |
| Fluid | Fluid Statics | | |
| 5. | Fluid Pressures, Pressure Heads, and different types of pressures. | 1 | 1 |
| 6. | Equipment's for pressure measurement | 1 | 1 |
| 7. | Problems on Pressure and equipment's | 1 | 1 |
| 8. | Hydrostatic pressure, Buoyancy and Stability of floating bodies | 1 | 2 |
| 9. | Problems on Buoyancy | 1 | 2 |
| Fluid | Fluid Kinematics | | |
| 10. | Fluid Kinematics: uniform and non-uniform flows. | 1 | 3 |
| Fluic | Fluid Dynamics | | |
| 11. | Continuity Equation | 1 | 1 |
| 12. | Energy Equation / Bernoulli's Equation | 1 | 2 |
| Hyd | raulic Similitude | | |
| 13. | Dimensional Analysis | 1 | 1 |
| 14. | Buckingham's π-theorem & its application | 1 | 2 |
| 15. | Model analysis based on Reynold's & Froude's number | 1 | 2 |
| 16. | Geometric, kinematic & hydraulic similarities, Dimensional less numbers & their significance | 1 | 3 |
| Oper | Open Channel Flow and its Classifications | | |
| 17. | Open Channel Flow and its Classifications | 2 | 2 |
| 18. | States and regimes of flow | 2 | 2 |

| 19. | Chezys's and Manning's velocity equations | 2 | 2 | | |
|--|---|---|----|--|--|
| 20. | Problems on Chezys's and Manning's velocity equations | 2 | 2 | | |
| Desig | Design of Open Channels and Their Properties | | | | |
| 21. | Geometry and Design of Open Channels and Their Properties | 2 | 3 | | |
| 22. | Design of most efficient, effective and economical open channel sections | 2 | 3 | | |
| Energy and Momentum Principles | | | | | |
| 23. | Energy and Momentum Principles and their applications | 2 | 1 | | |
| 24. | Hydraulic jump and its applications | 2 | 3 | | |
| Flow Rate Measurement in Open Channels | | | | | |
| 25. | Measurement of discharge through weirs, modular and non-modular venturi-flumes. | 2 | 3 | | |
| Intro | Introduction to subject relevant software's | | | | |
| 26. | Introduction to MOD Flow | 2 | 1 | | |
| | TOTAL | • | 48 | | |

Signature of Teacher: \(\text{\sqrt{N}} \)

Dated: 18/11/2023

Remarks by DMRC: **APPROVED**

Signature of Chairman:

Dated: 21/12/2023