

Fundamentals of Hydraulics Module				
Course Title	OPEN CHANNEL HYDRAULICS			
Course Number	WRIE2073			
Degree Program	B.Sc. in Water Resources and Irrigation Engineering			
Module Name	Fundamental of Hydraulics			
Course Coordinator	Name: Office location Mobile:; e-mail: Consultation Hours:			
Instructor Name	Name: Office location Mobile:; e-mail: Consultation Hours:			
Course Information	Academic Year : _____ Year : II Semester: II Meeting Day: To be arranged at the beginning of the semester Meeting Time: To be arranged at the beginning of the semester Meeting Location: To be arranged at the beginning of the semester			
ECTS	5			
Weekly Contact Hours/ Students' work load	Lecture	Tutorial	Practice or Laboratory	Home study
	2	2	2	2
Course Objectives & Competences to be Acquired	The objective of this course is to provide students' knowledge on the parameters governing the flow through open-channels, and the types of water-surface-profiles. Students at the end of the course should be in a position to understand the principles of open channels flows, use the available energy of flow wherever possible and at the same time they should be in a position to determine water surface profile of open channel flows.			
Course Description/Course Contents	Types of Open-Channel Flow: Uniform Flow: Critical Flow: Rapidly varied flow: Gradually varied flow: Flow over spillways and through the passage under the sluice gates. Introduction to Unsteady flow and Aerated flow,			
Pre-requisites	Hydraulics-I			
Semester	Year 2, Semester I			
Status of Course	Compulsory			
Schedule/Syllabus				
Week	Contents		Teaching materials	
	1. OPEN CHANNEL FLOW AND ITS CLASSIFICATIONS (Lec=2hrs, Tut= 5hrs) 1.1 Introduction 1.2 Classification of Open Channel flows 1.3 Types of flows 1.4 Dimensionless Numbers and state of flow 1.5 Velocity and Pressure Distributions in Open Channel		➤ Subrmanya,k.(1986).flow in open channels.Tata McGraw-Hill,New Delhi. ➤ Flow in open Channels, K. Subramaya 1997 ➤ VenteChow (1959).open channel Hydraulics, McGraw-	

	<p>1. BASIC HYDRAULICS PRINCIPLES (Lec=3hrs, Tut=5hrs) 2.1 Geometry of Open Channels 2.2 Main Principles 2.2.1 Continuity Principle 2.2.2 Energy Principle in channel 2.2.2.1 Energy and depth relationship 2.2.2.2 The critical state of Flow 2.2.3 Momentum Principle</p>	<p>Hill Company, London. ➤ Henderson, F.M., (1966). Open channel flow, McMillan publishing inc., London. French, R.H., (1985). Open channel Hydraulics, McGraw-Hill company New York</p>
	<p>3. FLOW COMPUTATION FORMULAS (Lec=12hrs, Tut=15hrs) 3.1 Specific Energy 3.2 Critical Depth 3.3 Critical flow 3.4 Critical flow 3.4.1 The section factor for critical flow computation 3.4.2 Computation of critical flow 3.4.3 Control section (flow control) 3.5 Flow measurement 3.6 Uniform flow 3.6.1 Establishment of uniform flow 3.6.2 Computation of Uniform flow 3.6.3 Calculation of Normal Depth and Velocity 3.6.4 Resistance Coefficient Estimation 3.7 Best (economic) hydraulic sections</p>	
	<p>4. GRADUALLY VARIED FLOW (GVF) (Lec=5hrs, Tut=7hrs) 4.1 General Equation for Gradually varied flow 4.2 Classification of Flow Profiles 4.3 GVF Computations 4.3.1 The direct step method (distance from depth) 4.3.2 Graphical Integration</p>	
	<p>5. RAPIDLY VARIED FLOW (RVF) (Lec=5hrs, Tut=8hrs) 5.1 Characteristics of RVF 5.2 Flow over spillways 5.3 Hydraulic jump 5.3.1 Practical applications 5.3.2 Jump in horizontal rectangular channel 5.3.3 Types of jump 5.3.4 Basic characteristics of the Jump 5.4 Flow under Gates</p>	

6. UNSTEADY FLOW IN OPEN CHANNELS

(Lec=5hrs, tut=5hrs)

6.1 Introduction

6.2 Waves

6.2.1 Definitions

6.2.3 Waves -classification

6.2.3 wave celerity

6.3 Development of St.Venant Equations

6.4 The Methods of Characteristics