Water Engineering

Module Information

2022.01, Approved

Summary Information

Module Code	5304DCIV
Formal Module Title	Water Engineering
Owning School	Civil Engineering and Built Environment
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 5
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Civil Engineering and Built Environment

Learning Methods

Learning Method Type	Hours
Lecture	22
Online	11
Practical	6
Tutorial	11

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-CTY	CTY	January	12 Weeks

Aims and Outcomes

Aims	To introduce and then consolidate students' knowledge of the fundamental principles of engineering hydrology applied to civil engineering problems and provide an understanding of some of the key environmental and social problems with which they must deal within the context of global change and sustainable engineering. To present open channel flow concepts and provide students with the ability to perform and assess a range of hydraulic computations relating to open channel flow commonly used in civil engineering.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Analyse free surface flow problems using friction, energy and momentum considerations and predict the behaviour of sub-critical and super- critical open channel flows.
MLO2	2	Assess, interpret and quantify hydrological data including impact of climate change on the hydrological cycle.
MLO3	3	Perform and present engineering calculations, exercising technical judgement and making associated decisions.
MLO4	4	Apply relevant practical and laboratory skills to test the theoretical concepts encountered in the module and present appropriate findings of experimental work.

Module Content

Outline Syllabus	Open channel flow:Laminar and turbulent flow in open channels, principles of uniform flow, Chézy and Manning equations, development of friction equations, channel cross-sections, development of energy concepts & specific energy, critical flow considerations, normal depth and critical depth, applications of the energy principle, measurement structures, specific force considerations, analysis of hydraulic jump.Engineering hydrology:The hydrological cycle, climate change effects, precipitation, initial losses, infiltration, percolation, evapotranspiration, surface runoff, groundwater flow, rainfall and runoff catchment characteristics, impacts of urbanisation, hydrograph analysis, unit hydrograph theory.
Module Overview	
Additional Information	Knowledge of water engineering is essential for good practice of civil and environmental engineering. This module provides background material on open channel hydraulics and engineering hydrology that serve as a sound base for other relevant civil and environmental modules and for future professional practice. The material that will be taught includes a balance between theoretical principles and their application to real problems in hydraulic engineering. When studying open channel flows, students should gain an appreciation of the different types of flow that may occur in natural and engineered systems. The module will aid students' appreciation of hydrological processes and will demonstrate how to approach practical problems in applied hydrology.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Centralised Exam	Examination	70	2	MLO1, MLO2, MLO3
Portfolio	Report	30	0	MLO1, MLO3, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Clare Harris	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings