

Hydraulics

Module Information

2022.01, Approved

Summary Information

Module Code	4505CVQR
Formal Module Title	Hydraulics
Owning School	Civil Engineering and Built Environment
Career	Undergraduate
Credits	10
Academic level	FHEQ Level 4
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
Oryx Universal College WLL

Learning Methods

Learning Method Type	Hours
Lecture	22
Practical	6
Tutorial	11

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-PAR	PAR	September	12 Weeks

Aims and Outcomes

Aims	To introduce fundamental fluid properties and then consolidate students' knowledge to the concepts, theory and application of fluid mechanics and establish their relevance in civil engineering. To demonstrate and explore key hydraulic phenomena through experimentation and e-laboratory activities. To introduce key principles of the analysis of pipelines for fluid transport.
------	---

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Apply knowledge and understanding of hydrostatics and applications to manometry and submerged bodies.
MLO2	2	Identify the properties and nature of a fluid and evaluate the forces associated with static and dynamic fluids.
MLO3	3	Analyse the flow of water in simple pipeline systems and apply the concepts of mass conservation and Bernoulli's equation to one-dimensional flow.
MLO4	4	Apply understanding of hydraulics in relation to performing laboratory experiments and present appropriate findings of experimental and e-activities.

Module Content

Outline Syllabus	Properties of fluids: density, viscosity, surface tension, compressibility. Hydrostatic pressure: static pressure and head, Pascal's Law, measurement of fluid pressure and pressure differentials, centre of pressure on submerged plane surfaces both inclined and vertical. Fluid dynamics: classification of flow, continuity equation, energy and momentum of a fluid, Bernoulli's equation for frictionless flow, flow measurement devices, energy losses in pipelines, gravity pipelines, Reynold's number and pipe flow problems.
Module Overview	
Additional Information	The module provides students with an introduction to the inherent properties of fluids, predominantly water, both at rest and in motion and examines the behaviour of fluids in civil engineering applications. The lectures will provide the structure for learning while the laboratory activities / e-laboratory activities will foster the development of practical understanding and the acquisition of knowledge, through applied learning. The content of the module will encourage students to combine knowledge and mathematical skills to solve engineering problems.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Portfolio	Laboratory-based portfolio	100	0	MLO1, MLO2, 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
--------------	--------------------------	-----------