

# Hydraulics

## Module Information

2022.01, Approved

### Summary Information

Module Code	4205CIV
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
Civil Engineering and Built Environment

### Learning Methods

Learning Method Type	Hours
Lecture	22
Practical	9
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 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 study engineering design principles of pipe networks.
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**After completing the module the student should be able to:**

### Learning Outcomes

Code	Number	Description
MLO1	1	Demonstrate knowledge and understanding of hydrostatics and applications to manometry.
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	Demonstrate understanding in relation to performing laboratory experiments and present appropriate findings of experimental and E laboratory 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, pipe network analysis.
Module Overview	This module provides you 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. Lectures will provide you with structure for learning while the laboratory/e-laboratory activities will foster development of practical understanding and the acquisition of knowledge through applied learning.
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. Where this module is part of a Degree Apprenticeship programme, the knowledge learning outcomes are K2 and K4, the skills learning outcomes are S5.

### Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Portfolio	Portfolio	100	0	MLO1, MLO2, MLO3, MLO4

### Module Contacts

#### Module Leader

Contact Name	Applies to all offerings	Offerings
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Clare Harris	Yes	N/A
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**Partner Module Team**

Contact Name	Applies to all offerings	Offerings
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