

Liverpool John Moores University

Title: HYDRAULICS
Status: Definitive
Code: **4205CIV** (122914)
Version Start Date: 01-08-2021

Owning School/Faculty: Civil Engineering and Built Environment
Teaching School/Faculty: Civil Engineering and Built Environment

Team	Leader
Clare Harris	Y
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Academic Level: FHEQ4 **Credit Value:** 10 **Total Delivered Hours:** 42
Total Learning Hours: 100 **Private Study:** 58

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	22
Practical	9
Tutorial	11

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Portfolio	AS1	Laboratory activity / E laboratory based portfolio	100	

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.

Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate knowledge and understanding of hydrostatics and applications to manometry.
- 2 Identify the properties and nature of a fluid and evaluate the forces associated with static and dynamic fluids.
- 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.
- 4 Demonstrate understanding in relation to performing laboratory experiments and present appropriate findings of experimental and E laboratory activities.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Portfolio	1	2	3	4
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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.

Learning Activities

Lectures, tutorials and laboratory activities / E laboratory

Notes

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.