Liverpool John Moores University

Title:	HYDRAULICS
Status:	Definitive
Code:	**4020BEUG** (102742)
Version Start Date:	01-08-2016

Owning School/Faculty:	Civil Engineering
Teaching School/Faculty:	Civil Engineering

Team	Leader
Clare Harris	Y

Academic Level:	FHEQ4	**Credit Value:**	12	**Total Delivered Hours:**	54
Total Learning Hours:	120	**Private Study:**	66		

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24
Practical	15
Tutorial	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Unseen	70	3
Report	AS2	Laboratory based assignments and reports.	30	

Aims

To introduce the student to the concepts, theory and application of fluid mechanics and establish its relevance in civil engineering.
To demonstrate and explore key hydraulic phenomena through experimentation.
To study engineering design principles of pipe networks.

Learning Outcomes

After completing the module the student should be able to:

1   Identify the properties and nature of a fluid.
2   Evaluate the forces associated with a fluid, both static and dynamic.
3   Analyse the flow of water in pipelines.
4   Apply this analysis in conjunction with their knowledge of fluid properties to design simple pipe networks.
5   Identify and select appropriate pump characteristics to suit a given hydraulic situation.
6   Present and communicate appropriate findings of experimental work.

Learning Outcomes of Assessments

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

EXAM	1	2	3	4	5
REPORT	6				

Outline Syllabus

Properties of fluids:Density, viscosity,surface tension,compressibility.
Hydrostatic pressure:Static pressure and head, pressure at a point, Pascal's Law,relationship between pressure and head, measurement of fluid pressure and pressure differentials, centres of pressure on submerged planes, both inclined and vertical, buoyancy and stability of floating bodies.
Fluid dynamics; continuity equation, energy and momentum of a fluid, Bernoulli's equation for frictionless flow, practical flow measurement devices, energy losses in pipelines, design of gravity pipelines, pipe network analysis.
Hydraulic machines;pump characteristics, performance of a pump, pumps in series and parallel, specific speed.

Learning Activities

Lectures, tutorials and laboratory practicals.

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.