

Module Title:	Fluid Mechanics 1
Language of Instruction:	English
Credits:	5
NFQ Level:	6
Module Delivered In	2 programme(s)
Module Aim:	The aim of this module is: 1. To introduce the fundamental concepts of fluid systems and the behaviour of the working fluids involved; 2. To give students a broad understanding of the advantages and challenges of sustainable energy systems.
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Solve basic problems relating to fluid statics.
LO2	Solve basic problems relating to fluid dynamics.
LO3	Distinguish between types of pumps and fans in terms of their design and performance.
LO4	Quantify by calculation and experimental measurement the characteristics of fluids.
LO5	Offer an informed opinion on the different methods of achieving sustainability of future energy needs and the challenges inherent in such a policy.
Pre-requisite learning	
Module Recommendations <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
Incompatible Modules <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>	
No requirements listed	

Module Content & Assessment

Indicative Content

Units

Fundamental units. Derived units

Fluid Statics

Definition of a fluid. Density, relative density. Force, definition of pressure. Hydraulic jack. Measurement of pressure – upright, inverted and inclined U-tube manometers, Bourdon pressure gauge. Archimedes' principle. Centre of pressure

Fluid Dynamics

Types of flow, Conservation of mass, Conservation of energy, Continuity Equation. Bernoulli's equation. Measurement of volume flow rate – venturi meter, orifice plate, turbine meter, rotameter.

Pumps & fans

Positive displacement pumps, Centrifugal pumps & fans.

Sustainable Energy

Energy Sources, Use and Policy Wind Energy Wood Pellet and Chip Solar Thermal Biofuels and transport Fuels Geothermal and Heat pumps Solar PV and Fuel Cells Hydroelectricity Domestic Energy Ratings BER/DEAP/EPBD

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	30.00%
End of Module Formal Examination	60.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Examination	Class Test	1,2	10.00	Week 6

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Computer Competencies Assignment	1,2,4	10.00	Week 9
Practical/Skills Evaluation	Fluid Mechanics Labs: Fluid Statics, Centre of pressure, Calibration of Flowmeters, Centrifugal Fan, Gear Pump & Centrifugal Pump Laboratory reports and written assessment	3,4	20.00	Week 11

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	n/a	1,2,3,5	60.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	12 Weeks per Stage	4.00
Laboratory	12 Weeks per Stage	1.00
Independent Learning	15 Weeks per Stage	4.33
Total Hours		125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EMMEC_B	Bachelor of Engineering (Honours) in Mechanical Engineering	2	Mandatory
CW_EEMEC_D	Bachelor of Engineering in Mechanical Engineering	2	Mandatory