

MECH C1617: Fluid Mechanics 1

Module Title	:		Fluid Mechanics 1
Language of	f Instructio	n:	English
Credits:		5	
NFQ Level:		6	
Module Deli	vered 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 Ou	itcomes		
On successfu	ul completio	n of tl	his module the learner should be able to:
LO1	Solve basi	c prol	blems relating to fluid statics.
LO2	Solve basi	c prol	blems relating to fluid dynamics.
LO3	Distinguisł	n betw	veen types of pumps and fans in terms of their design and performance.
LO4	Quantify b	y calc	sulation and experimental measurement the characteristics of fluids.
LO5	Offer an in inherent in	forme such	ed opinion on the different methods of achieving sustainability of future energy needs and the challenges a policy.
Pre-requisite	e learning		
Module Rec This is prior l	ommendati earning (or	i ons a prac	ctical skill) that is recommended before enrolment in this module.
No recomme	ndations list	ted	
Incompatible	e Modules odules whic	h hav	e learning outcomes that are too similar to the learning outcomes of this module.
No incompati	ible module:	s liste	d
Co-requisite	Modules		
No Co-requis	ite modules	listed	
Requiremen This is prior l	ts earning (or	a prac	ctical skill) that is mandatory before enrolment in this module is allowed.
No requireme	ents listed		



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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: Flud 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 Examin	nd 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



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Module Workload

Workload: Full Time		
Workload Type	Frequency	Average Weekly Learner Workload
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