MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Fluid Mechanics		**Module Delivery**
Module Type	C		• ☐ **Theory** • ☒ **Lecture** • ☒ **Lab** • ☐ **Tutorial** • ☐ **Practical** • ☐ **Seminar**
Module Code	UOMU021032		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	**Semester of Delivery**	3
Administering Department	Air-conditioning and Refrigeration Eng. Tech. Dep.	**College**	UOMU
Module Leader	Abdulkareem A. Wahab	**e-mail**	abdulkareem.Abdulwahab@uomus.edu.iq
Module Leader's Acad. Title	Assist. Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	15/07/2023	**Version Number**	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1- This module fluid mechanics is intended to develop a deeper understanding of the relationship between design and analysis processing as this module discusses various fluid systems. 2- The student will be able to analyze simplified fluid problems with the aim of reduction of energy losses and manpower. The student will be able to identify/control the appropriate process parameters, and possible defects of processes malfunctions so as to remove them. 3- For each fluid process, the aspects covered include: aesthetics, principles, choices of materials, choice of processes, properties of materials, advantages and disadvantages, process economics. Examples are drawn from practical processes mainly used in aerospace, automotive and air conditioning industries. 4- To introduce the theory and practice of fluid machines parts and assemblies using a wide range of technologies. 5- To allow processes to be chosen appropriately for any given application with any given fluid material. 6- To develop group working, research and writing skills. 7- To provide knowledge on the influence of thermal and mechanical parameters on system structure.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Examine fluid processes to describe the system properties of fluid devices. 2- Calculate and measure the fluid behavior in thermal processes. 3- Define the characteristics of various fluid operations. 4- Choose appropriate processes for different parts. 5- Design parts such that they are suitable for energy utilization using appropriate techniques. 6- Graduates from this module will be skilled in the methods of scientific investigation. 7- They will be able to think as a fluid engineer, critically evaluating scientific information and solving scientific problems. 8- Will be able to effectively communicate scientific information.
Indicative Contents المحتويات الإرشادية	1) Introduction to Fluid Mechanics. 1- Fluid Properties. 2- Density. 3- Viscosity. 4- Pressure. 5- Shear stress. 2) Fluid Statics. a) Pressure Distribution. b) Forces. c) Buoyancy.

	d) Manometers. 3) Fluid Dynamics a) Momentum. b) Control Volume. c) Energy. d) Continuity. 4) Fluid machines and hydraulics

Learning and Teaching Strategies **استراتيجيات التعلم والتعليم**	
Strategies	1- Quizzes and tests throughout the semester to check understanding and knowledge. 2- Examinations, both written and practical, that assess learners' understanding of concepts, principles, and theories related to Fluid Processes. 3- Observation of learners' practical skills in laboratory and workshop based or simulated settings. 4- Peer evaluation and feedback tools used as part of group projects or reciprocal feedback assignments. 5- Assignments and essays used to assess learners' comprehension of theoretical concepts. 6- Presentation and demonstration of acquired knowledge in real-world scenarios.

Student Workload (SWL) **الحمل الدراسي للطالب**			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	116	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	8
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	34	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation **تقييم المادة الدراسية**					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	Quizzes	2	10% (10)	5,10	
	Assignments	1	5% (5)	9	
	Projects / Lab.	1	10% (10)	11	
	Reports	1	5% (5)	12	

Summative assessment	Midterm Exam	2 hr	10% (10)	7	
	Final Exam	3 hr	60% (60)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Fluid Properties.
Week 2	Deriving Pressure equation in fluids.
Week 3	Manometry and pressure measurements.
Week 4	Fluid forces on vertical surfaces.
Week 5	Force on inclined surfaces and center of pressure.
Week 6	Fluid forces on curved surfaces.
Week 7	Buoyancy and metastable center.
Week 8	Fluid dynamics applications.
Week 9	Control volume concept.
Week 10	Continuity.
Week 11	Momentum of fixed control volume.
Week 12	Momentum of moving control volume and inertial systems.
Week 13	Energy equation as applied to fluid systems.
Week 14	Fluid machinery and hydraulics.
Week 15	**Final exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي المختبري	
	Material Covered
Week 1	Fluid properties (density).
Week 2	Fluid properties (viscosity).
Week 3	Pressure distribution.
Week 4	Vertical gates.
Week 5	Inclined gates.
Week 6	Fluid forces on different types of surfaces.
Week 7	Improving metastable center.
Week 8	Introduction fluid dynamics (laminar flow).
Week 9	Introduction fluid dynamics (turbulent flow).
Week 10	Continuity.
Week 11	Fixed turbomachines blades.
Week 12	Moving turbomachines blades.
Week 13	Report.
Week 14	**Final exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the**

		Library?
Required Texts	1. Streeter, Mikell P. Fluid Mechanics. 2. Fox, Fluid Mechanics. 3. F. White, Elementary Fluid Mechanics.	Yes
Recommended Texts	None	
Websites	None	

Grading Scheme مخطط الدرجات				
Group	**Grade**	**التقدير**	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.