



Ministry of Higher Education and
Scientific Research - Iraq

University of Warith Al_Anbiyaa....
College of Engineering
Oil and Gas Department



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Fluid Mechanic II		
Module Type	Basic		
Module Code	ENG223		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGII	Semester of Delivery	4
Administering Department	OGE	College	ENG
Module Leader	Hussien ali	e-mail	كلية
Module Leader's Acad. Title	Asst. Lecturer	Module Leader's Qualification	MS.c
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules**العلاقة مع المواد الدراسية الأخرى**

Prerequisite module	ENG213	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents**أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية**

Module Aims أهداف المادة الدراسية	This course provides students an information on the principal concepts and methods of fluid mechanics. Topics covered in the course include pipe systems and pipes network, fluid measurements(types and their importance), Non Newtonian liquids, dimensional analysis, pumps, flow of compressible fluid, and flow in porous media. Students will work to formulate the models necessary to study, analyze, and design fluid systems through the application of these concepts, and to develop the problem-solving skills essential to good engineering practice of fluid mechanics in practical applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1- To give the student the knowledge in types of fluid measurements; their importance, principles and applications. 2- To give the students an idea on Non-Newtonian fluids; their types and models, their physical principles of flow, and friction. 3- To give the students an idea on dimensional analysis grouping. 4- To give knowledge on types of pumps and their principles. 5- To make the students release the compressible fluid; their difference from incompressible fluid and how to write their basic equations
Indicative Contents المحتويات الإرشادية	Students will work to formulate the models necessary to study, analyze, and design fluid systems through the application of these concepts, and to develop the problem-solving skills essential to good engineering practice of fluid mechanics in practical applications.

Learning and Teaching Strategies**استراتيجيات التعلم والتعليم**

Strategies	<p>Using the following:</p> <ol style="list-style-type: none"> 1- Discussion. 2- Brain storming by encouraging students to produce a large number of ideas about some issue or problem raised during the lecture. 3- Self-learning by teaching the student by his own according to his special abilities and mental and cognitive levels responding to his preferences and interests to achieve development and integration of his capabilities. 4- Cooperative learning by team working.
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Student Workload (SWL)**الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعاً**

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	90	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

كلية الهندسة**Module Evaluation****تقييم المادة الدراسية**

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Quizzes	2	10% (10)	5, 13	LO #1

Formative assessment	Assignments	2	10% (10)	3, 11	LO # 1 and 4
	Projects / lab	1	10% (10)	15	LO # 1 and 3
	Report	7	10% (10)	2,4,6,8,10,12,14	LO # 1,3 and 4
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1 and 3
	Final Exam	2hr	50% (50)	16	LO # 1 and 3
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	<u>Multiple-pipe system</u> Parallel connection, series connection.
Week 2	<u>Multiple-pipe system</u> Reservoir pipe junction, and piping network.
Week 3	<u>Flow measurement</u> Why it is important? Custody Transfer Measuring System Obstructive devices, and Non-obstructive devices. Pitot tube
Week 4	<u>Flow measurement of close channel</u> Venture meter, Orifice meter.
Week 5	<u>Flow measurement of close channel</u> Nozzle meter, Rotameter.

Week 6	Flow measurement of open channel Weir and Notch.
Week 7	Mid Exam
Week 8	Non- Newtonian liquids Introduction, types of Non-Newtonian liquids, apparent viscosity.
Week 9	Non- Newtonian liquids Velocity distribution.
Week 10	Non- Newtonian liquids friction factor, and the pressure losses.
Week 11	Dimensional Analysis The Principle of Dimensional Homogeneity, Why do we need to do dimensional analysis? Dimensionless group using Rayleigh Method.
Week 12	Dimensional Analysis Dimensionless group using Buckingham Pi Theorem.
Week 13	Pumps Types, application, similarity rules, starting point for one and two pumps connected in parallel or sequence.
Week 14	Compressible fluid Introduction, applications, energy losses of its flow, derivation of sonic equation, supersonic and subsonic flow and the types of measurement.
Week 15	Preparatory week before the final Exam

Week 16	Final Exam
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Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

	Material Covered
Week 1	Hydraulic bench, Volumetric flow rate measurement.
Week 2	Osborne-Reynolds and laminar flow Demonstration.
Week 3	flow through a Venture meter.
Week 4	Head losses in bends.
Week 5	Energy losses in piping system.
Week 6	Fluid friction in a smooth & roughened pipe/flow measuring and valves.
Week 7	Bourdon manometer calibration (dead weight).

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> • Streeter, V. "Fluid Mechanic", 6th edition, Mc-Graw Hill, 1975 . • Frank M. White "Fluid Mechanics", 5th edition, McGraw Hill. 1997. 	

	<ul style="list-style-type: none"> Coulson & Richardson's Chemical Engineering - Vol. 1, Fluid Flow, Heat Transfer and Mass Transfer - 6th edition, Butterworth-Heinemann, 1999. R. C. Hibbeler "FLUID MECHANICS", 2nd edition in SI units, Pearson Education, 2021. 	
Recommended Texts	Frank M. White "Fluid Mechanics", 5th edition, McGraw Hill. 1997.	
Websites		

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.