

	<p>Ministry of Higher Education and Scientific Research - Iraq</p> <p>University of Warith Al_Anbiyaa.... College of Engineering Oil and Gas Department</p>	
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## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Fluid Mechanics I</b>		Module Delivery
Module Type	<b>Basic</b>		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	<b>ENG213</b>		
ECTS Credits	<b>5</b>		
SWL (hr/sem)	<b>125</b>		
Module Level	UGII	Semester of Delivery	
Administering Department	OGE	College	Engineering
Module Leader	Dr.Salam Jabar	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Asst.Lect.Mujtaba Mahdi	e-mail	<a href="mailto:Mujtaba.mahdi@uowa.edu.iq">Mujtaba.mahdi@uowa.edu.iq</a>
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

## Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	CALC123	<b>Semester</b>	2
<b>Co-requisites module</b>	None	<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Aims</b> أهداف المادة الدراسية	This course provides students an information on the principal concepts and methods of fluid mechanics. Topics covered in the course include pressure, hydrostatics, control volume analysis; mass conservation, momentum conservation and energy conservation for moving fluids; viscous fluid flows, flow through pipes; dimensional analysis; boundary layers. 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.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1- To give the student the knowledge in fluid types, physical properties and the consequence of such properties on fluid flow, and types of units and their conversion.</li><li>2- To make the students release the forces acting on static fluid.</li><li>3- To give knowledge on types of flow and the basic forces acting on simple profiles and shapes in an steady fluid flow.</li><li>4- To give knowledge on viscous flow ,friction factor and losses in pipes.</li></ol>
<b>Indicative Contents</b> 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

<b>Strategies</b>	Using the following: <ol style="list-style-type: none"><li>1- Discussion.</li></ol>
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- 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.

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	60	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	4
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	125		

### Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 12	LO #1 and 4
	Assignments	2	10% (10)	2, 10	LO # 1, 3 and 4
	Projects /	-	-	-	-
	Report	1	10% (10)	13	LO # 1 and 3
Summative assessment	Midterm Exam	2 hr	20% (20)	7	LO # 1,3 and 4
	Final Exam	2hr	50% (50)	16	LO # 1,3 and 4

Total assessment	100% (100 Marks)		
<b>Delivery Plan (Weekly Syllabus)</b>			
المنهاج الاسبوعي النظري			
	<b>Material Covered</b>		
<b>Week 1</b>	<u><b>Introduction</b></u> Syllabus and References Definition, types of fluids, units and dimensions		
<b>Week 2</b>	<u><b>Physical Properties</b></u> dynamic and kinematic viscosity, surface tension, vapor pressure and cavitation.		
<b>Week 3</b>	<u><b>Static Fluid</b></u> static fluid and gage measurement.		
<b>Week 4</b>	<u><b>Static Fluid</b></u> Application on pressure gage measurement.		
<b>Week 5</b>	<u><b>Hydrostatic Forces on Submerged Surfaces</b></u> Hydrostatic Forces on Plane Surfaces, and curved Surfaces .		
<b>Week 6</b>	<u><b>Hydrostatic Forces on Submerged Surfaces</b></u> Buoyancy		
<b>Week 7</b>	<u><b>Dynamic Fluid</b></u> Definition, Reynolds no. ,types of flow and flow pattern . flow in noncircular duct, and the derivation.		
<b>Week 8</b>	<u><b>Governing Equations</b></u> Continuity equation, momentum equation, and energy equation.		
<b>Week 9</b>	<u><b>Governing Equations</b></u>		

	Euler equation, Bernoulli equation and its modification
<b>Week 10</b>	EGL and HGL.
<b>Week 11</b>	<b><u>Velocity Distribution</u></b> Derivation of velocity distribution, maximum, average and mean velocity for laminar flow
<b>Week 12</b>	<b><u>Velocity Distribution</u></b> Velocity distribution, maximum, average and mean velocity for turbulent flow. Correction factor
<b>Week 13</b>	<b><u>Friction in Pipes</u></b> Types of friction, skin friction and derivation of Darcy equation, form friction and its application.
<b>Week 14</b>	<b><u>Losses in Pipes</u></b> Major and minor losses.
<b>Week 15</b>	<b>Preparatory week before the final Exam</b>
<b>Week 16</b>	<b>Final Exam</b>

### Learning and Teaching Resources

مصادر التعلم والتدريس

	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	<ul style="list-style-type: none"> <li>• Streeter, V. "Fluid Mechanic", 6th edition, Mc-Graw Hill, 1975 .</li> <li>• Frank M. White "Fluid Mechanics", 5th edition, McGraw Hill. 1997.</li> <li>• Coulson &amp; Richardson's Chemical Engineering - Vol. 1, Fluid Flow, Heat Transfer and Mass Transfer - 6th edition, Butterworth-Heinemann, 1999.</li> <li>• R. C. Hibbeler "FLUID MECHANICS", 2nd edition in SI units, Pearson Education, 2021.</li> </ul>	

<b>Recommended Texts</b>	Frank M. White "Fluid Mechanics", 5th edition, McGraw Hill. 1997.
<b>Websites</b>	

### Grading Scheme

#### مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group</b> (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
<b>Fail Group</b> (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.

