

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Fluid Mechanics		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CIV010		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	
Administering Department	CV101	College	Civil Engineering College
Module Leader	Dr. Yasir Al-Ani	e-mail	<a href="mailto:aniyaser@uoanbar.edu.iq">aniyaser@uoanbar.edu.iq</a>
Module Leader's Acad. Title	Assis. Prof	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Ahmed Rahomi Rajab	e-mail	<a href="mailto:Ahmed.rahomi2@uoanabr.edu.iq">Ahmed.rahomi2@uoanabr.edu.iq</a>
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	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	The Aims of this course are to enable students to:

	<ol style="list-style-type: none"> <li>1. The course will introduce fluid mechanics and establish its relevance in civil engineering.</li> <li>2. Develop the fundamental principles underlying the subject.</li> <li>3. Demonstrate how these are used for the design of simple hydraulic components.</li> <li>4. Apply concepts of mass, momentum and energy conservation to flows.</li> </ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<p>By the end of successful completion of this course, the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Describe the SI unit system and convert units &amp; Explain the fundamental properties of fluids.</li> <li>2. Fluid Statics, pressure measures and hydrostatic forces.</li> <li>3. Derive, describe and apply Bernoulli's equation and Momentum equation.</li> <li>4. Understand the dynamics of fluid flows and the governing parameters.</li> <li>5. Define friction and friction factor, pipe head loss, apply the Moody Diagram and determine minor losses.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<p>This course introduces the student to fluid mechanics' concepts and fundamentals. The course also includes the topics such as Properties of fluids, Fluid Statics, Momentum and energy equations and applications. Bernoulli equation and applications, Dimensional analysis and similitude, Introduction to viscous flows and boundary layers, internal flows, laminar and turbulent flows, Head loss and friction factor, Flow over immersed bodies (external flow), and Lift and drag.</p>

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

<b>Strategies</b>	<p>Fluid mechanics course requires effective learning and teaching strategies to ensure students develop a strong understanding of complex concepts and their practical applications. The range of strategies that can enhance the learning experience for students in Fluid mechanics are; lecture-based teaching, practical applications, problem-solving assignments, group work and discussions, assessments and feedback, continuous learning, and encouraging self-directed learning.</p>
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### Student Workload (SWL)

#### الحمل الدراسي للطالب

<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	5.2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.13
<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	8% (8)	5, 9	LO # 1 and 2, 3 and 4
	Assignments	2	5% (5)	6, 11	LO # 1 and 2, 3 and 4
	Projects / Lab.		10% (10)		
	Report / activity	1	3% (3)	15	
Summative assessment	Midterm Exam	2 hr	24% (24)	7	LO # 1-3
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction in Fluid Mechanics
Week 2	Dimensions and Units systems
Week 3	The fundamental properties of fluids
Week 4	Fluids in Statics
Week 5	Pressure measurements and Manometers
Week 6	Hydrostatic forces on flat surfaces
Week 7	hydrostatic forces on curved surfaces
Week 8	<b>Mid-term Exam</b>
Week 9	Fluid Kinematics
Week 10	Derive, describe and apply Bernoulli's equation.
Week 11	State the applications of Momentum equation.
Week 12	Define friction and friction factor, pipe head loss, apply the Moody Diagram and determine minor losses.
Week 13	Solve problems involving pipe networks and pumps
Week 14	Derive a relationship among different parameters related to Fluid, Flow, and geometric properties by Dimensional Analysis.
Week 15	Describe the open channels and types of flow.
Week 16	<b>Preparatory week before the final Exam</b>

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Burden Gauge
Week 3	Centre of pressure
Week 5	Flow through Venturi-meter
Week 7	Flow types in Pipes
Week 10	Flow through an Orifice
Week 13	Impact of Jet
Week 15	Flow over Weirs

## Learning and Teaching Resources

### مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Lecture Notes	Yes
Recommended Texts	<ul style="list-style-type: none"> <li>Bruce R. Munson, Donald F. Young, Theodore H. Okiishi, and Wade W. Huebsch, Fundamentals of Fluid Mechanics, John Wiley &amp; Sons, 6th ed., 2009.</li> </ul>	Yes
Websites	<a href="https://www.uoanbar.edu.iq/Bank-Section.php">https://www.uoanbar.edu.iq/Bank-Section.php</a>	

## 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.