

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	HYDRAULIC STRUCTURE		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CIV020		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIV	Semester of Delivery	7
Administering Department	CV101	College	Civil Engineering College
Module Leader	Dr. Atheer Saleem Almawla	e-mail	Eng.atheer84@uoanabr.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Atheer Saleem Almawla	e-mail	Eng.atheer84@uoanabr.edu.iq
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	Fluid mechanics	Semester	4
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. use the knowledge and skills studied previously, especially, on fluid mechanics.2. to recognize the different types of hydraulic structures, to understand its purpose and function and to select the most appropriate structure and location for a specific problem.3. to design, to analyze and to proof that the hydraulic structure is save and economical.4. to broaden skills in team work, communication and planning through small projects.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1- Use and integrate the fundamental and basics studied towards the goal of selecting, analyzing and designing of hydraulic structures.2- Cope with decision making and satisfy competing objectives.3- Design, analyze and proof that the hydraulic structure is save and economical.4- Work in a team and learn successful group interaction for a project.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Chapter one</u> Introduction: Definitions and reviews, Types of Hydraulic Structures, Steps for Design of Hydraulic Structures , Causes of Failure of Hydraulic Structures Founded on Pervious Foundations , By providing piles at both U/S and D/S ends: , Failure by Direct Uplift [3 hrs]</p> <p><u>Chapter Two</u> Seepage under hydraulic structures: Causes of Failures of Weirs on Permeable Foundations , Theories of Seepage Flow , Design of Impervious Floor , Bligh’s Creep Method , Lane's Creep Method , Khosla's Theory [10 hrs]</p> <p><u>Chapter Three</u> Open Channel Flow: Classification Of Channel, Types of Flow In Channels, Laminar And Turbulent Flows , Subcritical, Supercritical, And Critical Flows , Geometrical Properties of Channel Section , Conservation Of Mass , Specific Energy And Critical Depth , Critical Flow , Uniform Flow In Channels [14 hrs]</p>

	<p><u>Chapter Four</u> Hydraulic jump and Stilling Basin: Energy loss, Hydraulic Jump at Sluice Gate Outlet , Classification of Water-Surface Profiles , Stilling Basins , Stilling Basin Design for Low Froude Numbers , R.S. Varshney Stilling Basin , S.A.F. (Saint Anthony Falls) Stilling Basin , U/SB.R. Stilling Basin . [12 hrs]</p> <p><u>Chapter Five</u> The Dams and Culvert design : Overview of Culverts, Design criteria of Culvert, Hydraulic design of culvert , Culvert operating with inlet control , Flow velocity through culvert _ : Classification Of Dams , Based On Function Served , Based On Hydraulic Design , Based On Rigidity , Gravity dams , Earth Dams , Arch Dams , Site Selection For A Dam , Selection Of Type Of Dam , Forces Acting On Gravity Dams , Structural Stability Of Gravity Dams , Foundations of Dams and their Treatment , Uplift pressure and control of seepage , The Uplift Pressure with drainage gallery [18 hrs]</p> <p><u>Chapter Six</u> The spillways and Hydraulic Design of Regulators: Head and Cross Regulators, Cross Regulator, Functions of Cross Regulators, Head Regulator, Functions of Head Regulators, Design of head and cross regulators: Selection of spillway type, Overflow (Ogee) Spillway, Chute (Open Channel/Trough) Spillway , Side Channel Spillway , Shaft Spillway , Discharge over ogee spillway , Design of ogee spillway , Coordinate coefficients for spillway crest , coefficient of discharge , Examples of spillway design (20 hr)</p> <p><u>Chapter Seven</u> Measurement flow structures and Underflow Gates : the Weirs , Sharp-Crested Weirs , Triangular Weirs , Broad-Crested Weirs , Advantages and Disadvantages of Weirs for Flow Measurement , Flumes , The Parshall Flume , Unsubmerged Analysis , Submerged Analysis , (12 hr)</p>
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Engineering statistic courses require effective learning and teaching strategies to ensure students develop a strong understanding of complex concepts and their practical applications. This strategy will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes,

	interactive tutorials and by using some software for data analysis
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.0
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.8
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)	3,10	LO #1, and 3
	Assignments	2	5% (5)	2, 12	LO # 2 and 3
	Projects / Lab.				
	Report	1	5% (5)		LO # 4
Summative assessment	Midterm Exam	2 hr	20% (20)	12	LO # 1-3
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Foundations: Classification and Select definitions
Week 2	Seepage under hydraulic structures
Week 3	Open channel flow
Week 4	Hydraulic Design of Regulators
Week 5	Design of pipes and Box Culverts
Week 6	Specific Energy and Critical Depth
Week 7	Design of Spillway

Week 8	Mid-term Exam
Week 9	Energy Dissipation Structures
Week 10	Flow-Measuring Structures
Week 11	Design of Dams
Week 12	Continued Design of Dams
Week 13	Hydraulic Design of Underflow Gates
Week 14	Foundations of Dams and their Treatment
Week 15	Hydraulic jump and Stilling Basin
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Hydraulic Structures by Novak. 4th Edition 2007	Yes
Recommended Texts	Hydraulic Structures by C S James, Springer Nature Switzerland AG ,2020	Yes
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
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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.