	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa.... College of Engineering Oil and Gas Department	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Drilling Engineering I	**Module Delivery**	
Module Type	**Core learning activity**		☒ **Theory**
Module Code	OGE311		☐ **Lecture**
ECTS Credits	**6**		☒ **Lab**
SWL (hr/sem)	**150**		☒ **Tutorial** ☐ **Practical** ☐ **Seminar**

Module Level	UGIII	**Semester of Delivery**	5
Administering Department	OGE	**College**	Engineering
Module Leader	Dr.Salam Jabar	**e-mail**	salam.jabar@uowa.edu.iq
Module Leader's Acad. Title	Ass. Prof. Dr	**Module Leader's Qualification**	PhD
Module Tutor		**e-mail**	E-mail
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	ENG223, OGE224	**Semester**	4
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course provides a comprehensive introduction to Drilling Engineering, covering essential topics such as drilling equipment, drill string design, and various types of rotary drilling rigs. Students will gain a deep understanding of the drilling process, key data requirements, and common drilling problems. The course emphasizes the selection and operation of drilling bits, including IADC classification, bit grading, wear calculations, and optimizing bit life. Students will also explore bit hydraulics, hydrostatic pressures, and subsurface pressures. Special focus will be given to formation pore and fracture pressure estimation, as well as an overview of hole problems encountered during drilling operations. Through this course, students will develop the skills needed to manage and optimize drilling fluid operations, predict pressures, and solve common drilling issues.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The course enhances students' understanding of drilling operations by providing in-depth knowledge of drill rig types and their applications in both onshore and offshore environments. Mastery of Hoisting systems, including load determination and power requirements, ensures efficient handling of drilling components. Understanding Drill bit mechanics and selection criteria optimizes penetration rates and drilling performance. Additionally, Analyzing critical safety parameters, such as pore and fracture pressures, equips students with the skills to mitigate well control risks. These competencies are essential for ensuring safe, efficient, and cost-effective drilling operations in various environments.

Indicative Contents المحتويات الإرشادية	In this course, students will learn: A fundamental understanding of petroleum well drilling procedures, its mechanics, and design methodology. An overview of drilling rig operations and related equipment; offshore drilling and advanced drilling tools; Drill-string design Drill bit Technology Pore pressure and fracture pressure calculations. Hole problems Overview

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that 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 considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4

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	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction; An Overview of Drilling Engineering
Week 2	Drilling Equipment
Week 3	Basics of Drill String Design
Week 4	Types of Rotary Drilling Rigs
Week 5	Drilling Process
Week 6	Data Required and Drilling Problems
Week 7	Drilling Problems
Week 8	Drilling Bit
Week 9	IADC Classification: Rotary Bits

Week 10	Bit Grading and Bit Wear Calculations
Week 11	Optimum Bit Life
Week 12	Bit Hydraulics
Week 13	Subsurface Pressures
Week 14	Formation Pore and Fracture Pressure Estimation
Week 15	Hole problems Overview
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Typical Mud Balance
Week 2	PH meter
Week 3	Marsh Funnel
Week 4	Variable Speed Rheometer
Week 5	Low Temperature Low Pressure Filter Press
Week 6	Analog and Digital -Resistivity Meters
Week 7	Preparation for the final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Bourgoyne, Adam T., Keith K. Millheim, Martin E. Chenevert, and Farrile S. Young. "Applied drilling engineering." 2. Rabia, Hussain. Well engineering & construction. London: Entrac Consulting Limited.	Yes
Recommended Texts		No
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.