	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	Well Logging and Formation Evaluation I		**Module Delivery**
Module Type	**Core learning activity**		☒ **Theory**
Module Code	OGE312		☐ **Lecture**
ECTS Credits	**5**		☒ **Lab**
SWL (hr/sem)	**125**		☐ **Tutorial** ☐ **Practical** ☐ **Seminar**

Module Level	UGIII	**Semester of Delivery**	5
Administering Department	OGE	**College**	ENG
Module Leader	Salam Khalid	**e-mail**	Salam.khalid@uowa.edu.iq
Module Leader's Acad. Title	Asst.Lect.	**Module Leader's Qualification**	MS.C
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	OGE224	**Semester**	4
Co-requisites module	1- It provides abroad foundation in the basic of science and engineering.	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	A well log is a continuous record of measurements made in a borehole, responding to variations in some physical properties of the rocks through which the borehole is drilled. The data obtained from the logs is considered one of the most important sources of data in petroleum engineering; therefore, the petroleum engineer should be able to understand how these tools work and can be used to evaluate the reservoir qualitatively and quantitatively.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Know the fundamentals, the objectives, and the types of well logs. 2- Application of well logs in Petroleum Engineering. 3- How to read the well-logging data and interpret them to understand the reservoir formation and the fluid it contains. 4- The ability to calculate the petrophysical properties using well-log data. 5- Differentiate the different types of well logs tools.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: **Part I: Review of the petrophysical properties** Review the fundamental petrophysical properties that petroleum engineering needs to estimate. The theoretical basis, equations, and methods that are related to each property. **Part II: Introduction to well logging** What is the meaning of well logging, the history of it, why study well logs, and what are the different types of well logs.

	Part III: the open-hole logging tools What are the different types of open hole logs, the principle, the application, and the affecting factor on each log Part III: Cased hole logs and Logging while drilling Introduce the other types of well logs. What are the application and uses for these logs. Differentiate between the open hole and the logging while drilling.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to Encourage students to ask and answer questions, as well as train students to implement many practical exercises in the laboratory (which covers most of what is studied in theoretical lectures), which in turn gives students the ability to carry out the work required of them in the future in their practical life.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) 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)	3, 7	LO #1, and 2
	Assignments	2	10% (10)	2, 11	LO # 3,
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	10	LO # 4
Summative assessment	Midterm Exam	2 hr	10% (10)	13	LO # 1-4
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	A review of petro-physical properties:
Week 2	Introduction to open hole logging tool
Week 3	Density Log:
Week 4	Sonic Log
Week 5	Neutron Log
Week 6	Gamma Ray Log
Week 7	Spontaneous Potential Log
Week 8	Resistivity Log

Week 9	Electrode-type tools (resistivity)
Week 10	Induction Tools
Week 11	Nuclear Magnetic Resonance (NMR)
Week 12	The Electromagnetic Propagation Tool, EPT
Week 13	Caliper Log
Week 14	Cased Hole Logs
Week 15	Logs While Drilling (LWD)
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to the Neuralog program and what is the application of it
Week 2	How to digitize well logs data using Neuralog program.
Week 3	Digitize the porosity logs (Density, Neutron, and Sonic log)
Week 4	Digitize the Gamma ray log, SP log, and caliper log
Week 5	How to merge the Las file for different logs
Week 6	Digitize the resistivity logs using the backup option
Week 7	How to import the Las files for the digitized logs

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Ellis, D. V., and Singer, J. M. (2007).Well Logging for Earth Scientists, the Netherland, 2nd Edition, Springer.	Yes
Recommended Texts	1. Serra, O. (2008).Well logging handbook. Editions Technip 2. Serra, O. E. (1983). Fundamentals of well-log interpretation. Elsever 3. Bessiouni, Z. (1994). Theory, Measurement and Interpretation of Well Logs, (pp. 1-13), Texas, SPE text book series, Vol.4. 4. Schlumberger, (1989). Log Interpretation-Principles/Applications, Eight Printing, Sugar Land, Texas. 5. Toby, D. (2005). Well Logging and Formation Evaluation, USA, Elsevier. 6. Hilchie, D. W. (1982). Applied open-hole log interpretation (for geologists and engineers), USA DW Hilchie	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.