	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	Reservoir Engineering I (Reservoir Fluids)	**Module Delivery**	
Module Type	**Core learning activity**		☒ **Theory**
Module Code	OGE314		☐ **Lecture**
ECTS Credits	**5**		☒ **Lab**
SWL (hr/sem)	**125**		☐ **Tutorial** ☐ **Practical** ☐ **Seminar**

Module Level	UGIII	**Semester of Delivery**	4
Administering Department	OGE	**College**	ENG
Module Leader	Dr. Dheiaa Alfarge	**e-mail**	dheiaa.al@uowa.edu.iq
Module Leader's Acad. Title		**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**	5
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	- This course describes naturally occurring hydrocarbon systems found in the reservoirs as the mixtures of organic compounds that exhibits multiphase over wide ranges of pressures and temperatures. - The effect of phase behavior during the life time of the reservoir on production and recovery will be explained in detail. - The key oil properties, such as bubble point, GOR, FVF, viscosity … etc, will be studied and how these properties are calculated. - The key gas properties, such as Dew point, Z factor, FVF, viscosity … etc, will be studied and how these properties are calculated - Miscellaneous data resources to calculated oil and gas properties - The properties of Oil field water include composition, Bw, viscosity, solubility, resistivity, interfacial tension, …etc. Gas liquid equilibrium ratio, pressures and composition calculation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The objective of this course is to help student to be 1. familiar with reservoir fluid properties and how PVT and laboratory data are used for tuning EOS and predictive models. Moreover, 2. Familiar with PVT envelope analysis and experimental work design. 3. Recognize and Use of the Reservoir fluid properties for Reservoir studies and calculation with MBE, reservoir simulations, …etc.

Indicative Contents المحتويات الإرشادية	The objective of this chapter is to review the basic principles of reservoir fluid phase behavior and illustrate the use of phase diagrams in classifying types of reservoirs and the native hydrocarbon systems.

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	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)	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 to Petroleum Reservoir Fluids
Week 2	Compositional Analyses
Week 3	Phase Behavior – Concepts, Tools
Week 4	Phase behavior – Classifications
Week 5	Equations of State -
Week 6	Reservoir Classification according to fluid type (part 1)
Week 7	Reservoir Classification according to fluid type (part 2)
Week 8	Reservoir Classification according to fluid type (part 3)
Week 9	Properties of Gases (Dry gases)
Week 10	Properties of Gases (Wet gases)
Week 11	Properties of oils (definitions, field data,)

Week 12	Properties of oils (studies, correlations
Week 13	Gas liquid Equilibrium
Week 14	Surface separation
Week 15	Properties of oil field water
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Sample transformation (Part 1)
Week 2	Sample transformation (Part 1)
Week 3	Bubble point
Week 4	Z- factor
Week 5	Formation volume factor
Week 6	Oil compressibility
Week 7	Flash differential

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	1. The properties of petroleum fluids, William D. McCain, Penwell 1992	Yes

	2. Properties of Reservoir Fluids, by J. S. Archer & C. G. Wall, 3. Reservoir Engineering Handbook by Tarek Ahmed, Fourth Edition, 2010 4. Petroleum Reservoir Fluid Property Correlations by W.D MacCain, John P.Spivy and Christopher P. Leen, Pennwell, 2010	
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.