MODULE DESCRIPTION

وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Petroleum Properties**			**Module Delivery**	
Module Type	**Core**			☒Theory ☒Lecture ☒Lab ☐Tutorial ☒Practical ☐Seminar	
Module Code	**PE214**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Petroleum Engineering Department		**College**	College of Engineering	
Module Leader	Assist. Lect. Amjed Rasool		**e-mail**	amjed.rassoul@gmail.com	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	MSc	
Module Tutor	Assist. Lect. Amjed Rasool		**e-mail**	amjed.rassoul@gmail.com	
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Scientific Committee Approval Date			**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 Objectives أهداف المادة الدراسية	1. Crude oil compositions, Classifications, API gravity, viscosity, vapor pressure, flash point, and distillation characteristics. 2. Standard testing methods, petroleum quality, and performance in industrial processes.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Knowledge	A2	A.2.1 Define the physical properties (density, API gravity, viscosity, pour point, flash point, etc.). A.2.2 Classify the chemical properties (hydrocarbon types, impurities such as sulfur, nitrogen, metals).
		A3	A.3.1 Define the oil and oil product properties, cloud point, pour point, flash point, and vapour pressure, etc. A.3.2 Recognize laboratory experiments of crude oil and product properties behavior at different conditions. A.3.3 Apply the experiments to the oil products and crude oils. A3.4 Analyze the results of the experiments on the crude oils and oil products.
	Skills	B1	B.1.1 Function efficiently as an individual B.1.2 Function as a member of multidisciplinary and multicultural teams.
		B2	B.2.1 Communicate effectively – graphically with a range of audiences using contemporary tools. B.2.2 Communicate verbally and in writing with a range of audiences using contemporary tools.
	Ethics	C3	C.3.1 Utilize contemporary technologies. C.3.2 Make use of codes of practice and standards, quality guidelines, C.3.3 Utilize health and safety requirements C.3.4 Show environmental issues and risk management principles.
Indicative Contents المحتويات الإرشادية	1. Unit 1: Introduction, Density, Specific gravity, Viscosity (6 hr). 2. Unit 2: Dehydration, Desalting, Distillation, Boiling range, Flash point (6 hr). 3. Unit 3: Sulfur content, Aniline point, Penetration number (4 hr). 4. Unit 4: Crude oil evaluation, Fractional distillation and TBP curves, Analysis of a fraction (6 hr). 5. Unit 5: Natural gas properties, Oil field water properties, Pour point, softening point (8 hr).		

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم	
Strategies	• Presentation • Interactive Learning • Discussions • Brainstorming • Group Solving Problems • Problem-Based Learning • Self-Learning

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.13
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 and 9	A2
	Assignments	2	10% (10)	2 and 10	A2
	Lab.	1	10% (10)	Continuous	A3
	Report	1	10% (10)	13	A2, A3
Summative assessment	Midterm Exam	1hr	10% (10)	7 and 11	A2
	Final Exam	3hr	50% (50)	16	A2, A3
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered	LOs
Week 1	Introduction (chemical composition, classification, properties)	
Week 2	Density, specific gravity and coefficient of expansion	A2, B1, B2, C3
Week 3	Viscosity , molecular weight, Vapor pressure, specific heat, latent heat	A2, B1, B2, C3
Week 4	Dehydration and desalting	A2, B1, B2, C3
Week 5	Heat of combustion, boiling range	A2, B1, B2, C3
Week 6	Flash point	A2, B1, B2, C3
Week 7	Sulfur content, aniline point	A2, B1, B2, C3
Week 8	Penetration number	A2, B1, B2, C3
Week 9	Crude oil evaluation	A2, B1, B2, C3
Week 10	fractional distillation and TBP curves	A2, B1, B2, C3
Week 11	Analysis of a fraction	A2, B1, B2, C3
Week 12	Natural gas properties	A2, B1, B2, C3
Week 13	Oil field water properties	A2, B1, B2, C3
Week 14	Pour point	A2, B1, B2, C3
Week 15	softening point	A2, B1, B2, C3
Week 16	**Preparatory week before the final Exam**	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered	LOs
Week 1	Introduction	
Week 2	Lab 1: Cloud points	A3
Week 3	Lab 2: Pour points	A3
Week 4	Lab 3: Standard Test Method for Reid Vapor pressure of Petroleum Product (ASTM D323)	A3
Week 5	Lab 4: Standard Test Method for Distillation of Petroleum Products (ASTM D86)	A3
Week 6	Lab 5: Standard Test Method for Kinematics Viscosity of Transparent and Opaque Liquids (ASTM D-445)	A3
Week 7	Lab 6: Standard Test Method for API gravity of Petroleum Products by Hydrometer method (D 287)	A3
Week 8	Lab 7: Standard Test Method for Softening Point of Asphalts and Tar Pitches (ASTM D36)	A3

Week 9	Lab 8: Standard Test Method for Saybolt Viscosity of Petroleum Products (ASTM D88)	A3
Week 10	Lab 9: Measuring the concentration of materials using refractive index	A3
Week 11	Lab 10: Emulsions in crude oil	A3
Week 12	Lab 11: Standard Test Method for Flash point of oil products (ASTM D39)	A3
Week 13	Lab 12: Standard Test Method for Moisture measurement of Asphalts (ASTM D1416)	A3

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. **Petroleum and gas field processing** – by H. K. Abdel-Aal, M. F. Fahim and Mohamed Eggour. 2. **Fundamentals of Petroleum Refining** – by Mohamed A. Fahim, Taher A. Alsahhaf, Amal Elkilani. 3. **Petroleum Engineer's Guide to Oil Field Chemicals and Fluids** – Johannes Fink. 4. ***Properties of Petroleum Fluids*** – by William D. McCain Jr.	No
Recommended Texts	Petroleum Engineer's Guide to Oil Field Chemicals and Fluids, Johannes Fink, 2011	No
Websites	https://eng.alayen.edu.iq//colleges/e/42	

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.