MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Oil Refining**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**UOMU0206041**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	**Fuel and Energy Techniques Engineering**		**College**	**Technical Engineering College**	
Module Leader	Shahad Mahmoud Mohammed		**e-mail**	shahad.mahmood.mohammed@uomus.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	Master's degree in Chemical Engineering	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	-Allow students to gain knowledge, skills, and capacities in a variety of fields, with a concentration on chemical engineering and oil refinery engineering. -Permit students to develop a comprehensive understanding of the methodology through recognizing the origins of crude oil and classifying it according to international and Arab organizations; characterization and analysis methods of crude oil in petroleum laboratories; the principle work and operation processes of oil and gas engineering units in oil refinery projects; and crude oil treatment techniques through major and minor engineering units in crude oil projects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The students who succeeded in this course; 1. Characters and analyze crude oil and operation process units in refinery projects. 2. Develop creative and critical thinking skills 3. Solve open-ended problems in refinery crude oil projects
Indicative Contents المحتويات الإرشادية	-The historical age of crude oil discovery (theories of its existence, crude oil and natural gas exploitation in energy generation, international and Arab oil organizations, distribution of oil refineries in Iraq) -Classification of crude oil hydrocarbon compounds (paraffin, olefins, bicyclic and unsaturated compounds); organic and inorganic materials, and heavy metals, and the effect of their presence on crude oil quality; and oil products (light, medium, and heavy) and their characteristics resulting from crude oil refining operations. -Characterizing and analytical calculations methods of crude oil through (specific gravity, API, flash point, freezing point, spill point, smoking point, aniline point, Characterization coefficient, viscosity, cetane number, and octane number). -Operations processes of oil refinery units (atmospheric distillation towers, vacuum, thermal cracking unit, desulfurization unit, polymerization unit, blending improvement unit for gasoline, metal pollutant removal unit, coking unit, and water

	treatment unit) -Mathematical methods for calculating boiling points according to (ASTM-D86, TBP, and EFV) -Crude oil treatment methods and hydrogen sulphide gas disposal units. -Computational methods for energy in crude oil (sensible heat, latent heat, heat capacity, heat of combustion, and heat of vaporization).

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lecture, Demonstration, Discussion, Question and Answer, Drill and Practice, Problem Solving.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	108	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	210		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	1	10%	3, and 6	
	Assignments	5	10%	3,5,7,10	
	Projects / Lab.	1	10%	1,2,3,4,5,6,7	
	Report	1	10%	1,14	
Summative assessment	**Midterm Exam**	2	20%		
	Final Exam	3	40%		

Total assessment	100%		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	History and Development of Refining Processes Kinds of Refineries.
Week 2	Types of Petroleum Refinery Plant
Week 3	Refinery Feedstock and Products
Week 4	Products Composition of Crude Oil Refining
Week 5	Physical Property Characterization Data and Thermophysical Properties
Week 6	Physical Property Characterization Data and Thermophysical Properties
Week 7	Physical Property Characterization Data and Thermophysical Properties
Week 8	Mathematical Calculation of Physical Property Characterization Data and Thermophysical Properties
Week 9	Crude Oil Distillation
Week 10	Crude Oil Distillation
Week 11	Conversion between ASTM and TBP Distillation
Week 12	Fractionation Towers
Week 13	Mathematical Calculation of Crude Oil Distillation
Week 14	Treating Processes
Week 15	Crude Oil Pre-treatment and Mathematical Calculation of Thermal Properties
Week 16	**Final exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Density
Week 2	Viscosity ASTM D455
Week 3	Flash point ASTM D92
Week 4	Flash point ASTM D93
Week 5	Distillation ASTM D86
Week 6	Smoke point for kerosene
Week 7	Carbon residue of oil

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Sinnott, R. A. Y. (2014). Chemical engineering design (Vol. 6). Elsevier. 2. Green, D. W., & Southard, M. Z. (2019). Perry's chemical engineers' handbook. McGraw-Hill Education. 3. Jones, D. S., & Pujadó, P. P. (Eds.). (2006). Handbook of petroleum processing. Springer Science & Business Media. 4. Gary, J. H., Handwerk, G. E., & Kaiser, M. J. (2007). Petroleum refining: technology and economics. CRC press.	
Recommended Texts	1.Meyers, R. A. (2016). Handbook of petroleum refining processes. McGraw-Hill Education. 2. Duval, S. (2022). Natural gas sweetening. Surface Process, Transportation, and Storage.	
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.