

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			
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level		Semester of Delivery	
Administering Department	Fuel and Energy Techniques Engineering Department	College	Shatt Al-Arab University College
Module Leader	Ali Saaduldeen abdulhameed	e-mail	Ali.almusawi.iq@gmail.com
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc
Module Tutor	Ali Saaduldeen abdulhameed	e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	

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 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. 1. -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.
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Student Workload (SWL)

الحمل الدراسي للطلاب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	102	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	108	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب 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% (100 Marks)		

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	https://link.springer.com/referencework/10.1007/978-3-319-05545-9 https://www.wiley.com/en-be/Petroleum+Refining+Design+and+Applications+Handbook,+Volume+1-p-9781118233696	

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.