

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Principles of Chemical Engineering		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code			
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level		Semester of Delivery	
Administering Department	Fuel and Energy Technologies Engineering	College	Shatt Al-Arab University College
Module Leader	Maha munadhil salman	e-mail	maha.munadhil.ali@sa-uc.edu.iq
Module Leader's Acad. Title	Assitance Lectrur	Module Leader's Qualification	M.Sc Chemistry
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mass Balance and Energy Balance	Semester	L2-S1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. To know the fundamentals of fundamentals units and dimensions. 2. To know the conversion of units and conversion factors. 3. To know the chief variables of process, such as mass, volume, flow rate, chemical composition, pressure, and temperature. 4. To know the analyses of multicomponent solutions and mixtures. 5. To know the fundamentals for material balances on batch, semi-batch, and continuous processes. 6. To the knowledge of the general strategy for solving material balance problems. 7. To the knowledge of the material balances without/ with chemical reactions. 1. To know the real, ideal gases and vapors by studying their properties.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>The student able to:</p> <ol style="list-style-type: none"> 1. Understanding the fundamentals units, dimensions, conversion of units, dimensional homogeneity and knowledge of the conversion of units and conversion factors. 2. To knowledge the chief of process variables, such as mass, volume, flow rate, chemical composition, pressure, temperature and analyses of multicomponent solutions and mixtures. 3. To knowledge the terms closed system and open system. 4. To the knowledge of the fundamentals for material balances on continuous, batch, and semi-batch processes. 5. To knowledge the process data representation, analysis, and know the flow charts and flow charts scaling. 6. Understanding the overall and component balances and knowledge of the general strategy for solving material balance problems. 7. Understanding the material balances without chemical reactions by choice of basis 8. Understanding the material balances with chemical reactions by studying the limiting and excess reactants, conversion, yield, selectivity, and purging. 9. Understanding of the gases and vapors by studying the properties of Ideal gases 10. Understanding the material balances for ideal gas mixtures. 11. Knowledge of real gases and real gas mixtures by studying equations of state, and compressibility charts.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> 1. Introduction to Principles of Chemical Engineering, Fundamentals units, and dimensions, process data representation and analysis. (8 hr) 2. Process variables, such as mass, volume, flow rate, chemical composition, pressure, and temperature. (8 hr) 3. Fundamentals for material balances on continuous, batch, and semi-batch processes, Flow charts and flow charts scaling. (8 hr) 4. Define the terms closed and open systems. (4 hr). 5. material balances without chemical reactions by choice of basis, the overall and component balances. (8 hr) 6. Understanding the balances for systems with recycle and bypass streams, material balances with chemical reactions. (8 hr).

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, written exam, Quizzes, reports, seminars, Practical testing and Online testing.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	73	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	137	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	
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	4	10% (10)	3,6,9,12	
	Assignments	2	10% (10)	6,12	
	Seminar	0	10% (10)		
	Report/ Lab.	0	10% (10)		

Summative assessment	Midterm Exam	2hr	10% (10)	7	
	Final Exam	2hr	50% (50)	15	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1-3	<p>Introduction to Engineering Calculations:</p> <p>Unit, dimensions, conversion of units and dimensional homogeneity, process data representation and analysis.</p>
Week 4-6	<p>Process Variables:</p> <p>Mass, volume, flow rate, chemical composition, pressure, and temperature.</p>
Week 7-8	<p>Fundamentals of Material Balances:</p> <ul style="list-style-type: none"> - Introduction to Material Balances and Choose of basis, - Overall and component balances for systems, <p>A General Strategy for Solving Material Balance Problems</p>
Week 9-11	<p>Material Balances without Chemical Reactions:</p> <p>Balances on continues, batch and semi-batch processes, flow charts, flow charts scaling.</p>
Week 12	<p>Material Balances with Chemical Reactions</p> <p>Limiting and excess reactants, conversion, yield, selectivity, purging.</p>
Week 13	<p>Gases and Vapors:</p> <p>Ideal gases, material balances for ideal gas mixtures</p>
Week 14	<p>Real gases:</p> <p>Equations of state, compressibility charts, real gas mixtures.</p>
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> - Richard M. Felder and Ronald W. Rousseau, "ELEMENTARY PRINCIPLES OF CHEMICAL PROCESSES", Third Edition, John Wiley & Sons, Inc., 2005, Edition, with Integrated Media and Study Tools. David M. Himmelblau, James B. Riggs, ٢٠١٢, "Basic principles and calculations in chemical engineering", 8th edition. 	yes
Recommended Texts	<ul style="list-style-type: none"> - Richard M. Felder, 2019, "Elementary principle of chemical Processes" 4th edition. Mass and Energy Balancing Calculations for Plant Design, David Pritchard and Shaik Feroz, © 2021 Taylor & Francis Group, LLC 	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