

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Chemical Engineering Principles I		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	BCE117		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGI11	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Prof Dr. Alaa Kareem Mohammed	e-mail	dr.alaa@kecbu.uobaghdad.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Israa M, Rashid	e-mail	israa_msc2018@kecbu.uobaghdad.edu.iq
Peer Reviewer Name	Dr. Ziad Tarik	e-mail	ziadtarak@kecbu.uobaghdad.edu.iq
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

<p>Module Objectives أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. Unit Conversions: Students should be able to convert between different units commonly used in chemical engineering, such as mass, volume, temperature, pressure, and concentration. 2. Mass balance: Students should understand the concept of mass balances and be able to apply them to chemical processes. 3. Stoichiometry: Students should be proficient in performing stoichiometric calculations, including determining reactant and product quantities, calculating theoretical yields, and understanding limiting reagents. 4. Ideal Gas Laws: Students should be familiar with the basic principles of ideal gases, including the ideal gas law equation ($PV = nRT$) and its applications in calculations involving temperature, pressure, volume, and molar quantities.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. Applying the fundamental principles of chemical engineering, including mass and energy balances to solve engineering problems. 2. performing calculations related to chemical engineering, such as unit conversions, stoichiometry, ideal gas laws, vapor. 3. Demonstrate the knowledge and understanding of the fundamental concepts, principles and theories underpinning Biochemical Engineering with core knowledge in: engineering analysis. 4. Generate ideas, proposals and solutions or arguments independently and/or collaboratively in response to set scenarios and/or self-initiated activity. 5. Analyzing and interpret data obtained from chemical engineering processes 6. Skills in solving problems.
<p>Indicative Contents المحتويات الإرشادية</p>	<p><u>Part A - Units and Dimensions</u> Fundamental units and conversion factors, Dimensional analysis and unit consistency, stoichiometry of equations, Conservation of mass. Concentration and compositions representation. [25 hrs]. Revision problem classes [6 hrs].</p> <p><u>Part B – stoichiometry</u> Chemical equations and reactions, Calculation of reactant and product quantities, Limiting reagents and theoretical yields, Percent yield and excess reactants [25 hr]. Revision problem classes [6 hrs].</p> <p><u>Part C – Mass balance</u> Conservation of mass, Material balance equations for physical process, Calculation of input and output flows, Solving balance equations for single and multiple units [36 hr]. Revision problem classes [6 hrs].</p> <p><u>Part D- Gas calculations</u> Ideal Gas Laws and Gas Calculations, Boyle's law, Charles's law, and Avogadro's law Ideal gas law equation ($PV = nRT$), Calculation of pressure, volume, temperature, and molar quantities [40 hr]. Revision problem classes [6 hrs].</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Chemical Engineering Principles is a field of engineering that applies principles of chemistry, physics, and mathematics to design, develop, and optimize processes that convert raw materials into useful products, while ensuring safety, cost-effectiveness, and sustainability. It involves the design and operation of chemical plants and equipment, as well as the development and improvement of processes for making chemicals, fuels, and materials. In summary, Chemical Engineering Principles is a multifaceted field that involves the application of engineering principles to the design and development of processes and products that have a wide range of applications in various industries like energy, pharmaceuticals, food processing, and many others.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2hr(total)/6	25% (25)	3,5,7,9,10and 12	LO #1, #2 and #5
	Assignments	4hr (total)/2	15% (15)	2,4,6,8 and 13	LO #3, #4 and #6
	Projects / Lab.	-	-	-	-
	Report	-	-	-	-
Summative assessment	Midterm Exam	2hr/2	10% (10)	7	LO #1 - #3
	Final Exam	3hr/1	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Unit and dimensions
Week 2	Temp. - Pressure- compassion
Week 3	Density, specific volume, and specific gravity
Week 4	Weight, Force, Energy
Week 5	dimensional consistency
Week 6	Conversion of Equation
Week 7	Flowrate
Week 8	Mole and Molecular weight
Week 9	Average Molecular weight
Week 10	Mole percent and Weight percent
Week 11	Concentration
Week 12	Basis
Week 13	Material-balance
Week 14	Mass balance without chemical reaction
Week 15	Mass balance without chemical reaction
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<i>"Basic Principles and calculations Engineering"</i> .5 th edition By David M. Himmelblau	Yes
Recommended Texts	"Chemical Process Calculations" by D.C. Sikdar,2013	yes
Websites	https://visimix.com/what-is-chemical-process-calculation/	

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.