	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa.... College of Engineering Oil and Gas Department	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Production Engineering II			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**OGE323**			☐ **Lecture**	
ECTS Credits	**4**			☐ **Lab**	
SWL (hr/sem)	**100**			☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	UGIII		**Semester of Delivery**	2	
Administering Department	OGE		**College**	College of engineering	
Module Leader	Salam Jabar Hussain		**e-mail**	salam.jabar@uowa.edu.iq	
Module Leader's Acad. Title			**Module Leader's Qualification**	Ph.D.	
Module Tutor	NA		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	OGE313	**Semester**	5
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aim of the production engineering module in the third grade of the petroleum engineering department is to provide students with a comprehensive understanding of the principles and practices involved in the production of oil and gas. The module focuses on developing students' knowledge and skills related to the design, optimization, and management of oil and gas production systems. Stimulation: Students will gain knowledge of well stimulation methods. This includes understanding different types of well completions, hydraulic fracturing, and acidizing. Artificial Lift Systems: Students will be introduced to artificial lift methods used to enhance the production rate of oil and gas wells. They will learn about different types of artificial lift systems, including rod pumping, gas lift, and electrical submersible pumps. Throughout the module, students will also develop practical skills through hands-on exercises, case studies, and simulation exercises. The aim is to equip students with the necessary knowledge and skills to contribute effectively to the production operations in the petroleum industry.
Module Learning Outcomes	Understand the fundamental principles of production engineering: Students should be able to demonstrate a comprehensive understanding of the basic principles and concepts of production engineering, including reservoir characteristics, fluid flow, well completion, and artificial lift methods.

مخرجات التعلم للمادة الدراسية	Analyze and interpret production data: Students should be able to collect and analyze production data from oil and gas wells, interpret the results, and identify potential production issues or opportunities for optimization. Design well completions: Students should be able to design and optimize well completions, considering factors such as reservoir characteristics, wellbore stability, and production objectives. They should also be able to evaluate different completion techniques and select the most appropriate ones for specific reservoir conditions. Evaluate and select artificial lift methods: Students should be able to assess different artificial lift methods, including gas lift, sucker rod pumps, electric submersible pumps (ESPs), and hydraulic pumps. They should be able to analyze well performance and reservoir characteristics to select the most suitable artificial lift method for maximizing production. Identify and troubleshoot production problems: Students should be able to identify common production problems, such as scaling, sand production, and wax deposition, and propose effective solutions to mitigate or eliminate these issues. They should also be familiar with troubleshooting techniques to address equipment failures or operational challenges. Understand production optimization techniques: Students should be aware of various production optimization techniques, such as well stimulation, hydraulic fracturing, and workover operations. They should be able to evaluate the potential benefits and limitations of these techniques and apply them to enhance production rates and ultimate recovery. Apply health, safety, and environmental practices: Students should demonstrate a strong commitment to health, safety, and environmental practices in the production engineering field. They should be aware of relevant regulations and industry standards and incorporate them into their decision-making process to ensure safe and environmentally responsible operations. Communicate effectively: Students should be able to communicate technical concepts, analysis results, and recommendations effectively, both orally and in written form. They should be able to present their findings and ideas to both technical and non-technical audiences, demonstrating clarity, coherence, and professionalism.

Indicative Contents المحتويات الإرشادية	Understand production optimization techniques: Students should be aware of various production optimization techniques, such as well stimulation, hydraulic fracturing, and workover operations. They should be able to evaluate the potential benefits and limitations of these techniques and apply them to enhance production rates and ultimate recovery. Apply health, safety, and environmental practices: Students should demonstrate a strong commitment to health, safety, and environmental practices in the production engineering field. They should be aware of relevant regulations and industry standards and incorporate them into their decision-making process to ensure safe and environmentally responsible operations. Communicate effectively: Students should be able to communicate technical concepts, analysis results, and recommendations effectively, both orally and in written form. They should be able to present their findings and ideas to both technical and non-technical audiences, demonstrating clarity, coherence, and professionalism.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review of production engineering 1 and total production system.
Week 2	Inflow performance relationship (IPR): introduction, definition and explain the different cases
Week 3	Straight line IPR and the requirement to draw the IPR straight line
Week 4	Two phase IPR and the requirement to draw the IPR curve.
Week 5	Using Vogel's chart to construct IPR.
Week 6	Using standing chart to construct IPR.
Week 7	Application to use Vogel's, and standing charts to construct IPR.
Week 8	Construct combination IPR, by different methods.
Week 9	Vertical flow performance (VFP): introduction, definition and explain the different cases. Define the working chart, using working chart.
Week 10	Practice to use the working charts
Week 11	Artificial lift: methods, requirement for each method
Week 12	Gas lift, design and calculation.
Week 13	Electrical submersible pump, ESP, design and calculation.
Week 14	Final Project Completion of a production engineering 1 project.
Week 15	Exam preparation and review
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Pressure transient testing, John Lee, John Rollins, John Spivey. SPE Textbook service, Vol. 9 2. Reservoir Engineering Handbook; Tarek Ahmed; Gulf publishing. 3. Artficial-lift-methods-vol-4. 4. Beggs-d-Production-Optimization-Using-Nodal-analysis	Yes
Recommended Texts		
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.