



مواصفات المقرر: مقدمة في هندسة النفط والغاز

Course Specification of: Introduction to Petroleum Engineering

المعلومات العامة عن المقرر					
1.	اسم المقرر Course Title	Introduction to Petroleum Engineering مقدمة في هندسة النفط والغاز			
2.	رمز المقرر ورقمه Course Code and Number	PNGE 222			
3.	الساعات المعتمدة للمقرر Credit Hours	الساعات المعتمدة Credit Hours			الإجمالي Total
		محاضرات Lecture	عملي Practical	سمنار/تمارين Seminar/Tutorial	
		3	-	-	3
4.	المستوى والفصل الدراسي Study Level and Semester	2 nd level, 2 nd semester			
5.	المتطلبات السابقة المقرر (إن وجدت) Pre-requisites (if any)	PNGE 221			
6.	المتطلبات المصاحبة (إن وجدت) Co-requisites (if any)	-			
7.	البرنامج الذي يدرس له المقرر Program (s) in which the course is offered	Bachelor of Petroleum and Natural Gas Engineering			
8.	لغة تدريس المقرر Language of teaching the course	English/Arabic			
9.	نظام الدراسة Study System	Academic year of two semesters			
10.	مكان تدريس المقرر Location of teaching the course	Faculty of Petroleum and Natural Resources			
11.	اسم معد (و) مواصفات المقرر Prepared by	Assoc.Prof. Adel Al-Matary			
12.	تاريخ اعتماد مجلس الجامعة Date of Approval	2020			

وصف المقرر	
وصف المقرر بالإنجليزية	وصف المقرر بالعربية
This course is an overview of the petroleum industry: its history, its technical achievements, its role in the global-economy and its future prospects. A brief introduction to modern exploration, production and processing operations is included. Reserve estimation and volumetric calculations of oil in place; natural forces in oil and	

Prepared by
Assoc.Prof. Adel Al-Matary

Quality Assurance Unit
Assoc.Prof. Adel Al-Matary

Dean of the Faculty
Assoc.Prof. Bassim
AlKhirbash

Dean of the Development
& Quality Assurance Center
Assoc.Prof. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al Qaseem Mohammed Abas



gas reservoirs; rotary drilling; rig components; casing, cementing and well completion; well logging; surface equipment; Yemen oil fields.

Course Intended Learning Outcomes (CILOs) مخرجات تعلم المقرر

After completing the course, the student will be able to:		بعد الانتهاء من دراسة المقرر سوف يكون الطالب قادرا على أن:	
a1.	outline the basics of oil well drilling, completion and production		- a1
a2.	Describe the drilling equipment and the general basic of drilling techniques.		- a2
a3.	show formation evaluations, well logging, and well test analysis.		
b1.	Use the principles of engineering science in developing solutions to practical reservoir and production engineering.		-b1
b2.	Apply safety and environmental regulations in oil and gas operations		- b2
c1.	Carry out specialized engineering design in petroleum exploration, drilling, production, and reservoir engineering projects		- c1
c2.	know the drill stem testing procedure, test tool components and arrangement, quantitative pressure chart and data analysis.		- c2
d1.	Learn how to work as a part of teamwork		- d1
d2.	Learn proper use of equipment used in analysis.		- d2

مواءمة مخرجات تعلم المقرر مع مخرجات التعلم للبرنامج:

Alignment of CILOs (Course Intended Learning Outcomes) to PILOs (Program Intended Learning Outcomes)

مخرجات التعلم المقصودة من المقرر (Course Intended Learning Outcomes)		مخرجات التعلم المقصودة من البرنامج (Program Intended Learning Outcomes) (تكتب جميع مخرجات البرنامج كما هي رمزا ونصا)	
a1	outline the basics of oil well drilling, completion and production	A2	
a2	Describe the drilling equipment and the general basic of drilling techniques.	A2	
a3.	show formation evaluations, well logging, and well test analysis.	A3	
b1	Use the principles of engineering science in developing solutions to practical reservoir and production engineering.	B1	
b2	Apply safety and environmental regulations in oil and gas operations	B3	
c1	Carry out specialized engineering design in petroleum exploration, drilling, production, and reservoir	C1	

Prepared by
Assoc.Prof. Adel Al-Matary

Quality Assurance Unit
Assoc.Prof. Adel Al-Matary

Dean of the Faculty
Assoc.Prof. Bassim AlKhirbash

Dean of the Development
& Quality Assurance Center
Assoc.Prof. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al Qaseem Mohammed Abas



	engineering projects		
c2	Know the drill stem testing procedure, test tool components and arrangement, quantitative pressure chart and data analysis.	C2	
d1	Learn how to work as a part of teamwork	D1	
d2	Learn proper use of equipment used in analysis.	D2	

مواصلة مخرجات التعلم باستراتيجيات التعليم والتعلم والتقييم Alignment of CILOs to Teaching and Assessment Strategies			
أولاً: مواصلة مخرجات تعلم المقرر (المعارف والفهم) باستراتيجية التعليم والتعلم والتقييم: First: Alignment of Knowledge and Understanding CILOs			
مخرجات المقرر / المعرفة والفهم Knowledge and Understanding CILOs	استراتيجية التعليم والتعلم Teaching Strategies	استراتيجية التقييم Assessment Strategies	
a1 - outline the basics of oil well drilling, completion and production	- Lectures - Discussion - Demonstration - Case study	Examinations, Assignments Oral presentation Achievement tests	
a2 - Describe the drilling equipment and the general basic of drilling techniques.			
a3- show formation evaluations, well logging, and well test analysis.			
ثانياً: مواصلة مخرجات تعلم المقرر (المهارات الذهنية) باستراتيجية التدريس والتقييم: Second: Alignment of Intellectual Skills CILOs			
مخرجات المقرر / المهارات الذهنية Intellectual Skills CILOs	استراتيجية التعليم والتعلم Teaching Strategies	استراتيجية التقييم Assessment Strategies	
b1 - Use the principles of engineering science in developing solutions to practical reservoir and production engineering.	Discussion Demonstration Brain storm Problem solving	Essay test, Assignments, Oral presentations.	
b2 - Apply safety and environmental regulations in oil and gas operations			
ثالثاً: مواصلة مخرجات تعلم المقرر (المهارات المهنية والعملية) باستراتيجية التدريس والتقييم: Third: Alignment of Professional and Practical Skills CILOs			
مخرجات المقرر / المهارات المهنية والعملية Professional and Practical Skills CILOs	استراتيجية التعليم والتعلم Teaching Strategies	استراتيجية التقييم Assessment Strategies	
c1- Carry out specialized engineering design in petroleum exploration, drilling, production, and reservoir engineering projects	Self and independent learning Case study, Computer based teaching	Achievement tests Chart Drawing	
c2- Know the drill stem testing procedure, test tool components and arrangement, quantitative pressure chart and data analysis.			



رابعاً: موازنة مخرجات تعلم المقرر (المهارات العامة) باستراتيجية التدريس والتقييم:

Fourth: Alignment of Transferable (General) Skills CILOs

مخرجات المقرر Transferable (General) Skills CILOs		استراتيجية التعليم والتعلم Teaching Strategies	استراتيجية التقييم Assessment Strategies
d1-	Learn how to work as a part of teamwork	Small group working Student-led Seminars Case Study Method	Achievement tests Team working
d2-	Learn proper use of equipment used in analysis.		

محتوى المقرر Course Content

Theoretical Aspect موضوعات الجانب النظري

الرقم Order	الموضوعات الرئيسية/ الوحدات Topic List / Units	الموضوعات الفرعية Sub Topics List	عدد الأسابيع Number of Weeks	الساعات الفعلية Contact Hours	رموز مخرجات التعلم للمقرر (CILOs)
1	Introduction and overview of Petroleum Engineering	-definition of petroleum engineering - types of petroleum engineers	1	2	a1 a2
2	Drilling & Workover	-Rotary Drilling: General Method and Equipment -Basic Rig Components - Composition, Functions, and General Nature of Rotary Drilling Fluids	3	9	a1, b1, c1, d2
3	Rotary Drilling Techniques	-Vertical Drilling -Directional and Horizontal Drilling -Drilling Problems	2	6	a1, b1, c1, d2
4	Coring and Core Analysis	Conventional analysis Unconventional analysis	1	3	a2, b2
5	Well Logging	Miscellaneous Logging Tools	1	3	a2.2
6	Basic of Reservoir Engineering	Data Evaluation for Reservoir Calculations Estimating Hydrocarbons in place Material Balance (MB)	3	9	a3, c1, c2, d2
7	Basic of Production Engineering	Well Completion Stimulation Methods Well Testing	2	6	a3, c1
8	Natural Sources of Energy Available to Produce Oil		1	3	a2, c2, d2
9	Reservoir Drives	Artificial lift	1	3	a2, d2
عدد الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester			14	42	

Prepared by
Assoc.Prof. Adel Al-Matary

Quality Assurance Unit
Assoc.Prof. Adel Al-Matary

Dean of the Faculty
Assoc.Prof. Bassim
AlKhibash

Dean of the Development
& Quality Assurance Center
Assoc.Prof. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al Qaseem Mohammed Abas



الموضوعات العملية (إن وجدت) Practical Aspect (if any)				
الرقم Order	التجارب العملية/ التمارين / تدريبات Practical / Exercises/ Tutorials topics	عدد الأسابيع Number of Weeks	الساعات الفعلية Contact Hours	رموز مخرجات التعلم Course ILOs
1	N/A			
اجمالي الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester				

استراتيجيات التعليم والتعلم Teaching Strategies	
<ul style="list-style-type: none"> ▪ Lectures ▪ Discussion ▪ Demonstration ▪ Brain storm ▪ Problem solving ▪ Self and independent learning ▪ Case study, ▪ Computer based teaching ▪ Small group working ▪ Student-led Seminars 	

الأنشطة والتكليفات Tasks and Assignments					
م No	التكليف/ الواجب Assignments/ Tasks	نوع التكليف (فردى/ تعاوني)	الدرجة المستحقة Mark	أسبوع التنفيذ Week Due	مخرجات التعلم CILOs (symbols)
1	n/a				
إجمالي الدرجة Total Score					

تقييم التعلم Learning Assessment					
الرقم No.	أنشطة التقييم Assessment Tasks	أسبوع التقييم Week due	الدرجة Mark	نسبة الدرجة إلى الدرجة النهائية Proportion of Final Assessment	مخرجات التعلم CILOs (symbols)
1	Exercises	Weekly	20	13.3%	a1, a2, b1, b2, c1, c2
2	Assignments	Quarter	10	6.7%	a1, a2, b1, b2
3	Participation	Weekly	10	6.7%	c1, c2, d1, d2
4	Quizzes	End of a topic	10	6.7%	a1, a2, b1, b2



5	Mid-Term written exam	Week 7	30	20%	all
6	Final Exam (theoretical)	Week 16	70	46.6%	all
Total الإجمالي			150	100.00%	

Learning Resources مصادر التعلم

توثيق المراجع حسب نظام APA (اسم المؤلف، سنة النشر، اسم الكتاب، دار النشر، بلد النشر).

Required Textbook(s) المراجع الرئيسية (لا تزيد عن مرجعين)

No textbook is required. Lectures will be handouts from petroleum engineering courses taught within the industry by J. H. Hunter, H. C. Slider, and a host of others

Essential References المراجع المساندة

- 1- J.-R. Ursin & A. B. Zolotukhin. 1997. *Fundamentals of Petroleum reservoir engineering*.
Hoyskole Forbger.
- 2- Howard B. Bradley, 1987. *Petroleum Engineering Handbook, Society of Petroleum Engineers (SPE)*,.
- 3- Amyx, J. W., Bass, D. M., jr., and Whitting, R. L., 1960. *Petroleum Reservoir Engineering- Physical Properties, McGraw - Hill Book Company*,.
- 4- Slider, H. C., 1983. *World Wide Practical Petroleum Reservoir Engineering Methods*.
Penn Well Books Company

Electronic Materials and Web Sites etc. المصادر الإلكترونية ومواقع الإنترنت

- 1- www.spe.com
- 2- http://link.springer.com/
- 3- http://www.sciencedirect.com/

Course Policies:

1	Class Attendance: <ul style="list-style-type: none"> - Students are expected to attend classes regularly and promptly. - The attendance should not be less than 80%. - If the student has been absent, he is responsible for finding out any missed material by consulting other students or going to the professor's office hours.
2	Tardy: <ul style="list-style-type: none"> - Attendance and arriving on time for the class are necessary. If the student is late, he will be prevented from class.
3	Exam Attendance/Punctuality: <ul style="list-style-type: none"> - According to the rules the student gets absent in the exam of the course.
4	Assignments & Projects: <ul style="list-style-type: none"> - Papers survey or projects should be submitted by the time detriment by the professor.



5	Cheating: - According to the rules, cheating is a serious offense and will always result in an imposition of a penalty. The penalties that can be started from the range of canceling the result of the course to canceling the student's admission.
6	Plagiarism: -Plagiarism is a serious offense and will always result in an imposition of a penalty. The penalties that can be started by making a zero mark for the work.
7	Other policies: -The student should by a commitment by the rules inside class and university. Therefore, he is expected to show respect for his classmate, instructors & others.

البترول والموارد الطبيعية Faculty of Petroleum and Natural Resources

كلية Faculty:

هندسة النفط والغاز الطبيعي Petroleum and Natural Gas Engineering

قسم/ برنامج Department:

العام الجامعي: 2019-2020م

خطة مقرر: مقدمة في هندسة النفط والغاز

Course Plan (Syllabus): Introduction to Petroleum Engineering

معلومات عن أستاذ المقرر Information about Faculty Member Responsible for the Course						
الاسم Name	Assoc.Prof. Adel M. Al-Matary		الساعات المكتبية (أسبوعياً) Office Hours			
المكان ورقم الهاتف Location & Telephone No.	770770769		السبت SAT	الأحد SUN	الاثنين MON	الثلاثاء TUE
البريد الإلكتروني E-mail	a.almatary@su.edu.ye					الأربعاء WED
						الخميس THU

معلومات عامة عن المقرر General information about the course						
1.	اسم المقرر Course Title	Introduction to Petroleum Engineering مقدمة في هندسة النفط والغاز				
2.	رمز المقرر ورقمه Course Code and Number	PNGE 222				
3.	الساعات المعتمدة للمقرر Credit Hours	الساعات المعتمدة Credit Hours				الإجمالي Total
		محاضرات Lecture	عملي Practical	سمنار/تمارين Seminar/Tutorial	تدريب Training	
		3	-	-	-	3
4.	المستوى والفصل الدراسي Study Level and Semester	2 nd level, 2 nd semester				
5.	المتطلبات السابقة للمقرر Pre-requisites	PNGE 221				
6.	المتطلبات المصاحبة (إن وجدت) Co-requisite	-				
7.	البرنامج الذي يدرس له المقرر Program (s) in which the course is offered	Bachelor of Petroleum and Natural Gas Engineering				
8.	لغة تدريس المقرر Language of teaching the course	English/Arabic				
9.	مكان تدريس المقرر Location of teaching the course	Faculty of Petroleum and Natural Resources				

وصف المقرر Course Description	
<p>This course is an overview of the petroleum industry: its history, its technical achievements, its role in the global-economy and its future prospects. A brief introduction to modern exploration, production and processing operations is included. Reserve estimation</p>	

Prepared by
Assoc.Prof. Adel Al-Matary

Quality Assurance Unit
Assoc.Prof. Adel Al-Matary

Dean of the Faculty
Assoc.Prof. Bassim
AlKhirbash

Dean of the Development
& Quality Assurance Center
Assoc.Prof. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al Qaseem Mohammed Abas



and volumetric calculations of oil in place; natural forces in oil and gas reservoirs; rotary drilling; rig components; casing, cementing and well completion; well logging; surface equipment; Yemen oil fields

Course Intended Learning Outcomes (CILOs) مخرجات تعلم المقرر

After completing the course, the student will be able to:		بعد الانتهاء من دراسة المقرر سوف يكون الطالب قادرا على أن:
a1.	outline the basics of oil well drilling, completion and production	- a1
a2.	Describe the drilling equipment and the general basic of drilling techniques.	- a2
	show formation evaluations, well logging, and well test analysis.	
b1.	Use the principles of engineering science in developing solutions to practical reservoir and production engineering.	-b1
b2.	Apply safety and environmental regulations in oil and gas operations	- b2
c1.	Carry out specialized engineering design in petroleum exploration, drilling, production, and reservoir engineering projects	- c1
c2.	Know the drill stem testing procedure, test tool components and arrangement, quantitative pressure chart and data analysis.	- c2
d1.	Learn how to work as a part of teamwork	- d1
d2.	Learn proper use of equipment used in analysis.	- d2

Course Content محتوى المقرر

Theoretical Aspect خطة تنفيذ الموضوعات النظرية

الرقم Order	الوحدات (الموضوعات الرئيسية) Units	الموضوعات التفصيلية Sub Topics	الأسبوع Week Due	الساعات الفعالية Con. H
1	Introduction and overview of Petroleum Engineering	-definition of petroleum engineering - types of petroleum engineers	Week 1	2
2	Drilling & Workover	-Rotary Drilling: General Method and Equipment -Basic Rig Components - Composition, Functions, and General Nature of Rotary Drilling Fluids	Week 2-3	9
3	Rotary Drilling Techniques	-Vertical Drilling -Directional and Horizontal Drilling	Week 4-5	6

Prepared by
Assoc.Prof. Adel Al-
Matary

Quality Assurance Unit
Assoc.Prof. Adel Al-Matary

Dean of the Faculty
Assoc.Prof. Bassim
AlKhirbash

Dean of the Development
& Quality Assurance Center
Assoc.Prof. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al Qaseem Mohammed Abas



		-Drilling Problems		
4	Coring and Core Analysis	Conventional analysis Unconventional analysis	Week 6	3
5	Mid Term Exam		Week 7	3
6	Well Logging	Miscellaneous Logging Tools	Week 8	3
7	Basic of Reservoir Engineering	Data Evaluation for Reservoir Calculations Estimating Hydrocarbons in place Material Balance (MB)	Week 9-11	9
8	Basic of Production Engineering	Well Completion Stimulation Methods Well Testing	Week 12-13	6
9	Natural Sources of Energy Available to Produce Oil		Week 14	3
10	Reservoir Drives	Artificial lift	Week 15	3
11	Final Exam		Week 16	3
عدد الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester			16	48

Practical / Training/ Tutorials/ Exercises Aspects الخطة تنفيذ موضوعات الجانب العملي			
الرقم Order	موضوعات العملي/ المهام / التمارين Practical/ Tutorials/ Exercises Aspects	الأسبوع Week Due	الساعات الفعلية Cont. H
1	▪ N/A		
اجمالي الأسابيع والساعات الفعلية Number of Weeks /and Contact Hours Per Semester			

استراتيجيات التعليم والتعلم Teaching Strategies
<ul style="list-style-type: none"> ▪ Lectures ▪ Discussion ▪ Demonstration ▪ Brain storm ▪ Problem solving ▪ Self and independent learning ▪ Case study, ▪ Computer based teaching ▪ Small group working ▪ Student-led Seminars

الأنشطة والتكليفات Tasks and Assignments

Prepared by
Assoc.Prof. Adel Al-
Matary

Quality Assurance Unit
Assoc.Prof. Adel Al-Matary

Dean of the Faculty
Assoc.Prof. Bassim
AlKhibash

Dean of the Development
& Quality Assurance Center
Assoc.Prof. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al Qaseem Mohammed Abas



م No	التكليف/ الواجب Assignments	نوع التكليف (فردى/ تعاونى)	الدرجة المستحقة Mark	أسبوع التنفيذ Week Due
1	n/a			
Total Score إجمالي الدرجة			15/150 10/ 100	

تقويم التعلم Learning Assessment				
م No	أساليب التقويم Assessment Method	موعد (أسبوع) التقويم Week Due	الدرجة Mark	الوزن النسبي % Proportion of Final Assessment
1	Exercises	Weekly	20	13.3%
2	Assignments	Quarter	10	6.7%
3	Participation	Weekly	10	6.7%
	Quizzes	End of a topic	10	6.7%
4	Mid-Term written exam	Week 7	30	20%
5	Final Exam (theoretical)	Week 16	70	46.6%
المجموع Total			150	100.00%

مصادر التعلم Learning Resources	
توثق المراجع حسب نظام APA (اسم المؤلف، سنة النشر، اسم الكتاب، دار النشر، بلد النشر).	
Required Textbook(s) المراجع الرئيسية (لا تزيد عن مرجعين)	
No textbook is required. Lectures will be handouts from petroleum engineering courses taught within the industry by J. H. Hunter, H. C. Slider, and a host of others	
Essential References المراجع المساندة	
1- J.-R. Ursin & A. B. Zolotukhin. 1997. <i>Fundamentals of Petroleum reservoir engineering</i> . Hoyskole Forbger.	
2- Howard B. Bradley, 1987. <i>Petroleum Engineering Handbook, Society of Petroleum Engineers (SPE)</i> ,.	
3- Amyx, J. W., Bass, D. M., jr., and Whitting, R. L., 1960. <i>Petroleum Reservoir Engineering- Physical Properties</i> , McGraw - Hill Book Company,.	
4- Slider, H. C., 1983. <i>World Wide Practical Petroleum Reservoir Engineering Methods</i> . Penn Well Books Company	
Electronic Materials and Web Sites etc. المصادر الإلكترونية ومواقع الإنترنت	
1- www.spe.com	
2- http://link.springer.com/	
3- http://www.sciencedirect.com/	



Course Policies:

1	Class Attendance: <ul style="list-style-type: none"> - Students are expected to attend classes regularly and promptly. - The attendance should not be less than 80%. - If the student has been absent, he is responsible for finding out any missed material by consulting other students or going to the professor's office hours.
2	Tardy: <ul style="list-style-type: none"> - Attendance and arriving on time for the class are necessary. If the student is late, he will be prevented from class.
3	Exam Attendance/Punctuality: <ul style="list-style-type: none"> - According to the rules the student gets absent in the exam of the course.
4	Assignments & Projects: <ul style="list-style-type: none"> - Papers survey or projects should be submitted by the time detriment by the professor.
5	Cheating: <ul style="list-style-type: none"> - According to the rules, cheating is a serious offense and will always result in an imposition of a penalty. The penalties that can be started from the range of canceling the result of the course to canceling the student's admission.
6	Plagiarism: <ul style="list-style-type: none"> -Plagiarism is a serious offense and will always result in an imposition of a penalty. The penalties that can be started by making a zero mark for the work.
7	Other policies: <ul style="list-style-type: none"> -The student should by a commitment by the rules inside class and university. Therefore, he is expected to show respect for his classmate, instructors & others.



Prepared by
Assoc.Prof. Adel Al-
Matary

Quality Assurance Unit
Assoc.Prof. Adel Al-Matary

Dean of the Faculty
Assoc.Prof. Bassim
AlKhirbash

Dean of the Development
& Quality Assurance Center
Assoc.Prof. Huda Al-Emad

Rector of Sana'a University
Prof. Dr. Al Qaseem Mohammed Abas