Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide for Petroleum Engineering Department

Academic Program Description Form

University Name: Al-Farabi University College.

Faculty/Institute: Al-Farabi University College.

Scientific Department: ...Petroleum Engineering Department

Academic or Professional Program Name: BSc. in Petroleum Engineering

Final Certificate Name: .Bsc in Petroleum Engineering

Academic System: Yearly

Description Preparation Date: 1-9-2023

File Completion Date: 7-4-2024

Signature:

Head of Department Name:

Date: ٠٧/٤/٢٠٢٤

Signature:

Scientific Associate Name:
Dr. Adnan AL Azzawi

Date: 07.04.2024

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 07/04/2024

Signature: Dr. Khalidah AL-Qayim

Approval of the Dean

Prof. Dr. Ahmed gaitan

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Academic Program Description:

VISION

The vision of the Department of Petroleum Engineering is to become the leader in petroleum engineering education in Iraq creating the most respected, prestigious, and qualified graduates.

MISSION

The Mission of the Petroleum Engineering Program is to provide the necessary skills at the undergraduate level to discover and develop new techniques and processes for the efficient and economical extraction of oil and gas resources consistent with human health, ethics, safety and environmental needs. Also, to encourage our students for continuing education to serve the country in developing conventional and unconventional hydrocarbon resources.

OBJECTIVES

Graduates of the Petroleum Engineering Program will exhibit proficiency and excellence in the following attributes:

- Skills to use modern engineering tools and techniques to identify and solve technical problems associated with the production and management of oil and gas resources.

- Able to appreciate and function within economic, environmental, societal and ethical constraints.

- Able to create, assimilate, synthesize and communicate knowledge effectively of scientific and engineering principles and the application of these principles in solving petroleum and natural gas engineering problems using modern tools.

- Able to work effectively in multi-disciplinary teams in diverse environments and exhibit effective communication skills.

- Able to adapt to change through life-long learning.

Adopted Graduate Outcomes

1a- An ability to distinguish, identify, define, formulate, and solve engineering problems by applying principles of engineering, science and mathematics.

2a- An ability to perceive the continual necessity for professional knowledge growth and how to find access, assemble and apply it properly.

3a- An ability to skillfully communicate orally with a gathering of people and in writing with various managerial levels.

4a- A ability to work adequately on teams and to set up objectives, plan activities , meet due dates, and manage risk and uncertainty.

5a- An ability to perceive ethical and professional responsibilities in engineering cases and make brilliant judgments taking into account the sequences in worldwide financial

Course Description:

Over the years, students from around the country have pursued their engineering degree with us, taking advantage of the opportunity to learn one-on-one from outstanding faculty. Our faculty create innovative and rigorous research opportunities for undergraduate students. With faculty members who have worked around the world, a petroleum engineering education here means you are prepared for continued education, public service, and life-long learning. Petroleum engineering is of vital importance to Iraq's future, so we prepare Petroleum engineers involved in all facets of oil exploration and development, from identifying and characterizing the reservoir through drilling and completion to production. Petroleum engineers also find new ways to extract oil and gas from older wells. We offer courses that prepare students for careers in petroleum and energy-resource fields. Courses in petroleum engineering deal with drilling, production, reservoir engineering formation evaluation, computer simulation and enhanced oil recovery together with the Basic Engineering Courses. The curriculum prepares graduates to meet the demands of modern technology while emphasizing, whenever possible, the special problems encountered in Iraqi petroleum fields. You'll have the opportunity to joining the student chapter of the Society of Petroleum Engineers (SPE) namely, Al Farabi SPE Student chapter. Our chapter is actively involved in inviting academic faculty and industry professionals to present short courses , workshops and to talk about future career in this profession. Students graduating from the petroleum engineering program will be well prepared to serve the industry and themselves, through their technical knowledge, ethical considerations, participation in professional societies and desire for life-long learning.2.1.2 Statement of PEOs.

Program Vision:

The vision of the Department of Petroleum Engineering is to become the leader in petroleum engineering education in Iraq creating the most respected, prestigious, and qualified graduates.

Program Mission:

The Mission of the Petroleum Engineering Program is to provide the necessary skills at the undergraduate level to discover develop new techniques and processes for the efficient and economical extraction of oil and gas resources consistent with human health, ethics, safety and environmental needs. Also, to encourage our students for continuing education to serve the country in developing conventional and unconventional hydrocarbon resources.

Program Objectives:

Graduates of the Petroleum Engineering Program will exhibit proficiency and excellence in the following attributes:

- Skills to use modern engineering tools and techniques to identify and solve technical problems associated with the production and management of oil and gas resources.

- Able to appreciate and function within economic, environmental, societal and ethical constraints.

- Able to create, assimilate, synthesize and communicate knowledge effectively of scientific and engineering principles and the application of these principles in solving petroleum and natural gas engineering problems using modern tools.

- Able to work effectively in multi-disciplinary teams in diverse environments and exhibit effective communication skills.

- Able to adapt to change through life-long learning.

They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure:

List all courses in the program by term starting with the first term of the first year and ending with the last term of the final year.			Indicate Whether Course is Required , Elective or a Selected Elective by an R, an E or an SE.[1]	Offered: Year and Semester or Quarter	Maximum Section Enrollment for the Last Two Terms the Course was Offered[2]
Course					
Dept.	Code	Title			
Petr.	PE100	General Geology	R	year	153
Petr.	GE102	Mathematics I	R	year	153
Petr.	GE104	Computer Programming, I	R	year	153
Petr.	GE106	Engineering Drawing and Descriptive Geometry	R	year	
Petr.	GE108	Statics andDynamics	R	year	153
Petr.	GE110	English LanguageI	R	year	153
Petr.	GE114	Physics	R	year	153
Petr.	GE101	AnalyticalChemistry	R	Semester	153
Petr.	GE112	Arabic	R	year	153
Petr.		Human Rights	R	year	153
Petr.	PE200	Structural and Petroleum Geology	R	year	98
Petr.	GE202	Mathematics II	R	year	98
Petr.	GE204	Computer Programming II	R	year	98
Petr.	PE206	Fundamentals of Petroleum	R	year	98

		Engineering			
Petr.	GE208	Fluid Mechanics	R	year	98
Petr.	GE210	nglish LanguageII	R	year	98
Petr.	PE201	Petroleum Properties	R	Semester	98
Petr.	PE203	Eng. Thermodynamics	R	Semester	98
Petr.	GE203	Strength of Materials	R	Semester	98
Petr.	GE212	Human Rights	R	year	98
Petr.	PE300	Petroleum Reservoir Eng. I	R	year	110
Petr.	PE302	Petroleum Drilling Eng. I	R	year	110
Petr.	PE304	Petroleum Production Eng. I	R	year	110
Petr.	PE306	Well Logging	R	year	110
Petr.	PE308	Petroleum Engineering Economics	R	year	110
Petr.	GE302	Engineering Mathematics	R	year	110
Petr.	GE310	Technical English	R	year	110
Petr.	PE301	Geophysics	R	Semester	110
Petr.	GE303	EngineeringStatistics	R	Semester	110
Petr.	PE400	Petroleum Reservoir Eng. II	R	year	49
Petr.	PE402	Petroleum Drilling Eng. II	R	year	49

Petr.	PE404	Petroleum Production Eng. II	R	year	49
Petr.	PE406	Secondary Oil Recovery	R	year	49
Petr.	PE408	Numerical Methods andReservoir Simulation	R	year	49
Petr.	PE410	EngineeringProject	R	year	49
Petr.	PE401	Gas Technology	R	Semester	49
Petr.	PE403	Optimization	R	Semester	49
Petr.	PE405	Integrated Reservoir Management	R	year	49
Petr.		English LanguageIV	R	year	49

Learning Outcomes:

1. An ability to distinguish, identify, define and formulate engineering problems at the field by applying principles of petroleum engineering with the suitable solutions depending on the theoretical background.
2. An ability to perceive the continual necessity for professional knowledge growth and howto find access, assemble and apply it properly.
3. An ability to prepare a final report about field operations constituting the challenges and the main data obtained.
4. An ability to work adequately on teams at the locations and to set up objectives, plan activities, meet duedates, and manage risk and uncertainty.
5. An ability to perceive ethical and professional responsibilities in engineering cases andmake brilliant judgments.
6. An ability to control the instantons events in the oil field during drilling operations, production stage and in field management.

Teaching and learning strategies:

Faculty members used the modern instruments to develop the convey of the information to the undergraduate students, these strategies include the modern screen supported by the videos to explore the operation occur in the fields. In addition, students are arrangements into groups to arrange a presentation for more enthusiastic and active class.

1. Program Vision

The vision of the Department of Petroleum Engineering is to become the leader in petroleum engineering education in Iraq creating the most respected, prestigious, and qualified graduates

2. Program Mission

The Mission of the Petroleum Engineering Program is to provide the necessary skills at the undergraduate level to develop new techniques and processes for the efficient and economical extraction of oil and gas resources consistent with human health, ethics, safety and environmental needs. Also, to encourage our students for continuing education to serve the country in developing conventional and unconventional hydrocarbon resources.

3. Program Objectives

- **Skills to use modern engineering tools and techniques to identify and solve technical problems associated with the production and management of oil and gas resources.**
- **Able to appreciate and function within economic, environmental, societal and ethical constraints.**
- **Able to create, assimilate, synthesize and communicate knowledge effectively of scientific and engineering principles and the application of these principles in solving petroleum and natural gas engineering problems using modern tools.**
- **Able to work effectively in multi-disciplinary teams in**

diverse environments and exhibit effective communication skills.

- **Able to adapt to change through life-long learning.**

4. Program Accreditation

Does the program have program accreditation? And from which agency? no

5. Other external influences

Is there a sponsor for the program?

no

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	39	236		
College Requirements				
Department Requirements				
Summer Training	1			
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours

FIRST YEAR			1st Semester Hours/Week			2nd Semester Hours/Week		
Code	Subject	Units	Theo.	Tuto.	Lab.	Theo.	Tuto.	Lab.
PE100	General Geology	8	3	-	2	3	-	2
GE102	Mathematics I	6	3	1	-	3	1	-
GE104	Computer Programming I	2	2	-	2	2	-	2
GE106	Engineering Drawing and Descriptive Geometry	4	1	-	3	1	-	3
GE108	Statics and Dynamics	4	2	1	-	2	1	-
GE110	English Language I	2	1	-	-	1	-	-
GE114	Physics	4	2	-	-	2	-	-
GE101	Analytical Chemistry	3	2	-	2	-	-	-
GE103	Electrical Technology	3	-	-	-	2	-	2
GE112	Arabic	2	1	1	-	1	1	-
Total		38	17	3	9	17	3	9
Total hours per week			29			29		

SECOND YEAR			1st Semester Hours/Week			2nd Semester Hours/Week		
Code	Subject	Units	Theo.	Tuto.	Lab.	Theo.	Tuto.	Lab.
PE200	Structural and Petroleum Geology	6	2	-	2	2	-	2
GE202	Mathematics II	6	3	1	-	3	1	-
GE204	Computer Programming II	2	1	-	2	1	-	2
PE206	Fundamentals of Petroleum Engineering	4	2	1	-	2	1	-
GE208	Fluid Mechanics	5	2	2	-	2	2	2
GE210	English Language II	2	1	-	-	1	-	-
PE201	Petroleum Properties	2	1	-	3	-	-	-
PE203	Eng. Thermodynamics	3	3	1	-	-	-	-
GE203	Strength of Materials	3	-	-	-	2	1	2
GE212	Human Rights	2	1	1	-	1	1	-
Total		35	16	6	7	14	6	8
Total hours per week			29			28		

THIRD YEAR	1st Semester Hours/Week	2nd Semester Hours/Week

Code	Subject	Units	Theo.	Tuto.	Lab.	Theo.	Tuto.	Lab.
PE300	**Petroleum Reservoir Eng. I**	**8**	**3**	**1**	**2**	**3**	**1**	**2**
PE302	**Petroleum Drilling Eng. I**	**8**	**3**	**1**	**2**	**3**	**1**	**2**
PE304	**Petroleum Production Eng. I**	**4**	**2**	**1**	**-**	**2**	**1**	**-**
PE306	**Well Logging**	**6**	**3**	**1**	**-**	**3**	**1**	**-**
PE308	**Petroleum Engineering Economics**	**4**	**2**	**-**	**-**	**2**	**-**	**-**
GE302	**Engineering Mathematics**	**6**	**3**	**1**	**-**	**3**	**1**	**-**
GE310	**English Language III**	**2**	**1**	**-**	**-**	**1**	**-**	**-**
PE301	**Geophysics**	**2**	**2**	**1**	**-**	**-**	**-**	**-**
GE303	**Engineering Statistics**	**2**	**-**	**-**	**-**	**2**	**1**	**-**
Total		**42**	**19**	**6**	**4**	**19**	**6**	**4**
Total hours per week			**29**			**29**		

FOURTH YEAR			1st Semester Hours/Week			2nd Semester Hours/Week		
Code	**Subject**	**Units**	**Theo.**	**Tuto.**	**Lab.**	**Theo.**	**Tuto.**	**Lab.**
PE400	**Petroleum Reservoir Eng. II**	**6**	**3**	**2**	**-**	**3**	**2**	**-**
PE402	**Petroleum Drilling Eng. II**	**6**	**3**	**2**	**-**	**3**	**2**	**-**
PE404	**Petroleum Production Eng. II**	**6**	**3**	**2**	**-**	**3**	**2**	**-**
PE406	**Secondary Oil Recovery**	**6**	**3**	**-**	**-**	**3**	**-**	**-**
PE408	**Numerical Methods and Reservoir Simulation**	**6**	**2**	**-**	**2**	**2**	**-**	**2**
PE410	**Engineering Project**	**4**	**1**	**-**	**2**	**1**	**-**	**2**
PE401	**Gas Technology**	**3**	**3**	**-**	**-**	**-**	**-**	**-**
PE403	**Optimization**	**3**	**-**	**-**	**-**	**3**	**-**	**-**
PE405	**Integrated Reservoir Management**	**3**	**1**	**1**	**-**	**1**	**1**	**1**
	English Language IV	**2**	**1**	**-**	**-**	**1**	**-**	**-**
Total		**45**	**20**	**7**	**4**	**20**	**7**	**5**

Total hours per week	**31**	**32**

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	An ability to distinguish, identify, define, formulate, and solve engineering problems by applying principles of engineering, science and mathematics.
Skills	
Learning Outcomes 2	**An ability to perceive the continual necessity for professional knowledge growth and howto find access, assemble and apply it properly.**
Learning Outcomes 3	**An ability to skillfully communicate orally with a gathering of people and in writing with various managerial levels.**
Ethics	
Learning Outcomes 4	**A ability to work adequately on teams and to set up objectives, plan activities, meet duedates, and manage risk and uncertainty.**
Learning Outcomes 5	**An ability to perceive ethical and professional responsibilities in engineering cases andmake brilliant judgments taking into account the sequences in worldwide financial**

9. Teaching and Learning Strategies

Teaching and learning strategies and methods adopted in the implementation of the program in general.

10. Evaluation methods

Students are evaluated by direct discussion, written exams, oral exam, reports andmonthly exams

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
أ.د علي محسن المشاط	PhD-petroleum engineering-1976	هندسة الحفر			✓	
أ.د زهير داود احمد وهيب الشيخ	PhD-Geology-1970	جيوفيزياء الارض			✓	
أ.د محمد باقر خضر السنبلي	PhD-Petroleum engineering-1972	هندسة المكامن			✓	
أ.د مزاحم عزيز باصي غراني	PhD-Geology-1978	Geology			✓	
أ.د فالح حسن محمد	PhD-petroleum engineering-	هندسة الحفر				✓
أ.م.د عدنان عباس العزاوي	PhD-Mechanical Engineering-1976	ميكانيك			✓	
أ.م.د امجد عبدالقادر محمد	PhD-Geology-1988	الجيولوجيا			✓	
م.د شامل ابراهيم محمد البصام	PhD-petroleum engineering-1981	هندسة المكامن			✓	
م.د احمد جبير محمود	PhD-petroleum engineering-2008	هندسة المكامن			✓	
م.د شلال نايف مهدي	PhD-petroleum engineering-1991	هندسة الحفر			✓	

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
د.عبدالله جلال محمد	PhD- Drilling engineering	هندسة الحفر				✓
م.م غسان هشام جاني	MSc.- Petroleum engineering	هندسة المكامن				✓
د. تيسير غانم زكي	PhD- Geology- 2019	علم الارض			✓	
أ.م ضياء الدين عبدالوهاب شهاب	MSc- geology	علم الارض			✓	
م.م محمد كصاب شامخ ضمد	MSc- petroleum engineering- 2001	النمذجة المكمنية			✓	
م.م ليلى صديق محمد عبدالله	MSc- petroleum engineering- 2013	هندسة الانتاج			✓	
م.م اكرم جبار عبدالحسين	MSc- Computer Engineering	هندسة حاسبات			✓	
م.م ايمن فوزي زوين	M.Sc.- Chemical Engineering	هندسة كيميائية			✓	
م.م حسين علي مصلح حمد	MSc– Mechanical Engineering	هندسة الميكانيك			✓	
م.م ريام عبدالكريم حسن	MSc- Geology- 2018	علم الارض			✓	
م.م دالباسل عبد	MSc – chemical	هندسة كيميائية			✓	

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
	engineering-2016					
م.م طيبة نايف جاسم	**MSc – chemical engineering-2016**	هندسة كيميائية			✓	
م.م مروة حسن ابراهيم	**MSc – chemical engineering-2016**	هندسة كيميائية			✓	
م.م احمد امين خضير	**MSc-petroleum engineering-2020**	هنسة الحفر			✓	
م.م ازهر عايد مرزه	**MSc – Mechanical engineering-2020**	تكييف وتبريد			✓	

Professional Development

Mentoring new faculty members

New faculty is exposed to concentrate following and guiding by instructing them on the uniform manner and the ideal manner of convey information and how dealing with students, evaluation them and how to control the class discussions.

Professional development of faculty members

Faculty members always exposed to continuous dealing with the latest technological method of teaching and learning strategies. They constantly join the training programs arranged by the ministry of education and higher education.

12. Acceptance Criterion

The enrollment of the petroleum program is central through ministry of higher education and scientific research by admitting the students graduated from the scientific Baccalaureate branch.

13. The most important sources of information about the program

Phone No. 07712365333
Facebook:https://web.facebook.com/alfarabiuc.edu.iq
Website: www.alfarabiuc.edu.iq
E-mail: info@alfarabiuc.edu.iq

14. Program Development Plan

a. Create a communicative group for the academic staff with a head of the educational program in order to discuss and solve all the challenges that face the development of the educational system.

b. facilitate the educational labs. With latest technological equipment. facilitate the educational institution with a network to enhance the E-Learning processes.

c. Attract an academic staff from authentic universities to raise the level of the learning quality.

d. Support the lectures with recording videos created by the instructor to be available for the review purposes for the students.

e. Provide the library with rich references that convey the student with the latest scientific approaches.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B 1	B2	B3	B4	C1	C2	C3	C4
First	PE100	General Geology	Basic			✓				✓					✓
	GE102	Mathematics I	Basic	✓					✓						
	GE104	Computer Programming I	Basic	✓	✓		✓		✓	✓		✓			
	GE106	Engineering Drawing and Descriptive Geometry	Basic	✓	✓						✓			✓	
	GE108	Statics and Dynamics	Basic		✓						✓		✓		

	GE110	**English Language I**	**Basic**	✓	✓		✓			✓				✓	
	GE114	**Physics**	**Basic**				✓					✓			
	GE101	**Analytical Chemistry**	**Basic**	✓	✓				✓				✓		
	GE103	**Electrical Technology**	**Basic**								✓				
	GE112	**Arabic**	**Basic**		✓		✓					✓	✓	✓	✓
Second	**PE200**	**Structural and Petroleum Geology**	**Basic**	✓	✓	✓			✓						
	GE202	**Mathematics II**	**Basic**	✓	✓							✓			
	GE204	**Computer Programming II**	**Basic**	✓	✓		✓								
	PE206	**Fundamentals of Petroleum Engineering**	**Basic**		✓		✓		✓			✓			
	GE208	**Fluid Mechanics**	**Basic**	✓		✓	✓								

	GE210	**English Language II**	**Basic**	✓			✓									
	PE201	**Petroleum Properties**	**Basic**	✓		✓	✓		✓							
	PE203	**Eng. Thermodynamics**	**Basic**	✓		✓	✓			✓		✓	✓			
	GE203	**Strength of Materials**	**Basic**				✓									
	GE212	**Human Rights**	**Basic**		✓						✓					
Third	PE300	**Petroleum Reservoir Eng. I**			✓				✓		✓					
	PE302	**Petroleum Drilling Eng. I**	✓		✓		✓					✓				
	PE304	**Petroleum Production Eng. I**	✓	✓		✓										
	PE306	**Well Logging**	✓							✓						

	PE308	**Petroleum Engineering Economics**	✓	✓					✓						
	GE302	**Engineering Mathematics**	✓		✓						✓				
	GE310	**English Language III**	✓		✓				✓				✓	✓	
	PE301	**Geophysics**	✓		✓		✓					✓			
	PE300	**Petroleum Reservoir Eng. I**	✓			✓	✓		✓				✓		✓
Fourth	**PE400**	**Petroleum Reservoir Eng. II**	✓		✓				✓	✓					
	PE402	**Petroleum Drilling Eng. II**	✓	✓											
	PE404	**Petroleum Production Eng. II**	✓	✓	✓	✓						✓			
	PE406	**Secondary Oil Recovery**	✓												

	PE408	**Numerical Methods and Reservoir Simulation**	✓			✓			✓	✓					
	PE410	**Engineering Project**	✓	✓			✓				✓				
	PE401	**Gas Technology**	✓	✓		✓			✓			✓	✓		
	PE403	**Optimization**													
	PE405	**Integrated Reservoir Management**	✓	✓	✓		✓				✓			✓	
		English Language IV	✓				✓						✓	✓	

Republic of Iraq

Ministry of Higher Education and Scientific Research

AL-Farabi University Collage

Petroleum Engineering Department

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

(General Geology)

Syllabus

Course Description

Earth in space , surface relief of the interior of the earth, materials and minerals , igneous rocks , sedimentary rocks , metamorphic rocks, weathering and soil , ground water, structural geology and mountain building, earthquakes and earth interior, keys to the past, time in geology and geological time scale, historical geology and plate tectonic and continental drift.

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**PE100 General Geology**
4. Lecture Type	**Theoretical and laboratory lectures**
5. Semester/Year	**yearly**
6. No. of credit hours	**3 hrs per week theory and 2 hrs per week lab.**
7. Instructor Name	**Muzahim Aziz Basi**

8. Course Objectives:

1. Understanding geology
2. Importance of geology to petroleum engineering

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. Identify the various types of minerals and rocks
2. Understanding the various types of structural geology.
3. Understanding the types of porosity and permeability
4. Make correlation between the wells.

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. Know and discuss different types of minerals and rocks and also to discuss different subjects of geology
2. Write geological reports

Teaching/learning methods

1. Lectures..
2. Discussion
3. Answering the questions
4. Solve some geological problems

Assessment methods

1. Monthly exams
2. Participation of the students in the lectures
3. Written quizzes
4. Oral quizzes

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. best methods to study geology
2. Critical Thinking

Teaching/learning methods

1. brain storming
2. encourage critical thinking.

Assessment methods

1.exams
2. written quizzes

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. write academic reports
2. work within team
3. plan and organize time of study
4. initiate new ideas and motivate the others .

10. Grading

1.

1. final exam 50%
2. quizzes 10%
3. term test 20%
4. laboratory 20%

11. Course Content

Week No.	No. of hours	Reference	Topic
1	3	1. 1.plummer, Ch .C , Carlson, DH. And Mc. Geary , D. (2007). Physical geology. Mc. Graw Hill Higher Education. 617 pp. 2. Montgomery C.W .1997. fundamentals	introduction
2	3		Earth in space
3	3		Surface relief and interior of the earth
4	3		Materials and minerals
5	3		Materials and minerals
6	3		Igneous rocks
7	3		Igneous rocks
8	3		Sedimentary rocks
9	3		Sedimentary rocks
10	3		Sedimentary rocks
11	3		Examination
12	3		Metamorphic rocks
13	3		Weathering and soil
14	3		Weathering and soil
15	3		Processes of erosion and environment

12. References

1. Textbooks	Basi ,M.A. 2017 introduction to geology, 50 pp. Al Farabi university college.
2. References	1. 1.plummer, Ch .C , Carlson, DH. And Mc. Geary , D. (2007). Physical geology. Mc. Graw Hill Higher Education. 617 pp 2. Montgomery C.W .1997. fundamentals
3. Recommended readings	
4. Electronic/ Online references (Available upon request)	Geology .Wm.c. Brown publisher .411 pp

13. Course improvement plan

One field trip is necessary to observe the taught materials in the theoretical lectures , in addition it is necessary to ensure the dip and strike of some beds in the field.

كلية الفارابي الجامعة

قسم هندسة النفط

Course Description Form

1. Course Name:
Engineering drawing and descriptive geometry
2. Course Code:
GE 106
3. Semester / Year:
Semester two
4. Description Preparation Date:
1-10-2024
5. Available Attendance Forms:
class
6. Number of Credit Hours (Total) / Number of Units (Total)
Total number of hours= 4 Units= 4
7. Course administrator's name (mention all, if more than one name)
Name: Assistant Lecturer khattab imad Email: khattab.emad@alfarabiuc.edu.iq
8. Course Objectives

Course Objectives	• **Learning student how to to construct the side and view** • **Development the engineering sense**

9. Teaching and Learning Strategies	
Strategy	Dimensions & lettering. • Drawing paper layout. • Lines in engineering drawing +(Definitions of point, line, plane, types of even angles)

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
	4	Understand the reason behi studying engineering Drawi and its main applicatio Introduction	introduction	pract ng	Class work
		Dimensions & lettering. • Drawi paper layout. • Lines in engineering drawi +(Definitions of point, line, plane, types of even angles and types of planes Descriptive geometry)	Drawing pap layout	practicing	Class work
		Various exercises for training drawing types of lines. Orthographic Drawing sketching. • Bisect a rectangu line.	types lines	practicing	Class work
		Draw a line parallel to another straight line. • Bisecting an angle into two equal halves.	Bisecting angle	practicing	Class work
		Draw an arc tangent to two straight lines	an arc tangent	practicing	Class work
		Draw an arc that touches two other arcs.	an arc tangent	practicing	Class work
		Draw an ellipse using the four-center method.	ellipse	practicing	Class work

		Sketching auxiliary view + The difference between the two-dimensional and the three dimensional polyhedron with Euclid's theories (descriptive geometry)	**Sketching auxiliary view**	practicing	Class work
		Multiple exercises applications engineering operations	**auxiliary view**	practicing	Class work
		Definition of projections . • Parallel projection.+ Projection and its types (descriptive geometry)	Parallel projection	practicing	Class work
		Orthogonal projection. Representation of solids in plan (descriptive geometry)	Orthogonal projection	practicing	Class work
		Projection in the first corner.+ AutoCAD program (basics) descriptive engineering	AutoCAD	practicing	Class work
		Projection into the third corner. AutoCAD program (its role in facilitating the representation of shapes) descriptive engineering	AutoCAD	practicing	Class work
		AutoCAD program (the most important commands used the program theoretical descriptive geometry	AutoCAD	practicing	Class work
		Preparatory week before the fi Exam	AutoCAD	practicing	Class work

11. Course Evaluation

Quizzes= 25, monthly exams= 25, class work=25, homework= 25

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Abd-alrasool Alkhaffaf, Engineering Drawi , second Edition,1990.

Main references (sources)	David A. Madsin, Engineering Drawing a Design, fifth Edition, 2012.
Recommended books and references (scientific journals, reports…)	Engineering Drawing , second Edition, 1990.
Electronic References, Websites	https://www.amazon.com/Basic-Engineering-Drawing-R-S-Rhodes/dp/0582065941

كلية الفارابي الجامعة

قسم هندسة النفط

Course Description Form

1. Course Name: Mathematics I
2. Course Code:
GE 102
3. Semester / Year:
2024-2024
4. Description Preparation Date:
2024/12/5
5. Available Attendance Forms:
Paper form ,excel form
6. Number of Credit Hours (Total) / Number of Units (Total)
(4 hr./week)
7. Course administrator's name (mention all, if more than one name)
Name: Assistant Lecturer khattab imad Email: khattab.emad@alfarabiuc.edu.iq
8. Course Objectives

Course Objectives	-Understanding, predicting and optimizing engineering systems That deterministic and are modeled using differential equations. -Providing an introduction to differential equations and Their solutions and statistics. -Bringing the knowledge gained and making the connection between theoretical knowledge taught in Textbooks/homework problems. **etc.,**

9. Teaching and Learning Strategies	
Strategy	**1.** Lectures. **2.** Class problem solving **3.** Online discussion **etc.,**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	12	Solve Trigonometric functions, inverse trigonometric functions, logarithmicfunctions, exponentialfunctions, transcendental functions, other types of functions, Graph of functions).	Types of Functions	Lectures.	Quiz Class work Home work
3-7	16	Solve Explicit and implicit, application of derivatives graphing	Differentiation	Lectures.	Quiz Class work Home work
6-8	8	Integrals as a summation of areas, Definite Integrals, Application of Definite Integral, Areas and Volumes, Techniques of Integration	Integration	Lectures.	Quiz Class work Home work
8-10	8	Solve matrices and find The determinant	Determinants and Matrices.	Lectures.	Quiz Class work Home work
10-12	8	Understand Conical Section and solve area	Conical Section.	Lectures.	Quiz Class work Home work
12-14	8	Understand polar Coordinates and solve Conversion	Polar Coordinates.	Lectures.	Quiz Class work Home work

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Calculus 008 Edition, Kindle Edition by James Stewart.**
Main references (sources)	**Thomas' Calculus 14th Edition by Joel Hass, Christopher Heil, Maurice Weir**
Recommended books and references (scientific journals, reports…)	**Vector Algebra and Calculus: Stephen Robe Fuente: University of Oxford**
Electronic References, Websites	**1. https://www.infobooks.org/free-calculus-books-pdf/** **2. https://people.math.harvard.edu /~shlomo/docs/Advanced_Calculus.pdf**

Ministry of Higher Education

AL-Farabi University Collage

Petroleum Engineering Department

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

Physics
Syllabus

1. **Energy and its Conservation:** (Energy, Work, Power, Gravitational Potential Energy, Kinetic Energy, Conservation of Energy).
2. **Simple Harmonic Motion:** (Periodic Motion, Simple Harmonic Motion, Potential Energy of a spring), Conservation of Energy and Vibrating Spring.
3. **Wave Motion:** (Mathematical Representation of a Wave, Sound wave, Speed of Transverse Wave on a String, Reflection of a wave at a Boundary, The transmission of Energy in a Wave and the intensity of a Wave).
4. **Fluids:** (Density, Pressure, Pascal's Principles, Archimedes' Principle, Equation of Continuity, Bernoulli's Theorem, Viscosity, Stress and Strain).
5. **Surface Tension:** (Interfacial Tension, Contact Angel, Wetting Phenomena, Capillary Pressure).
6. **Heat Transfer:** (Conduction, Convection and Radiation).

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**GE114 Physics**
4. Lecture Type	**Hard and Soft**
5. Semester/Year	**Annual / 2020-2021**
6. No. of credit hours	**60 hr (2 hr/week)**
7. Instructor Name	**Assistant Lecturer Tiba Nayyef Jasim**

8. Course Objectives:

1. Providing an understanding of the classic and modern physical principles.
2. Developing critical thinking and quantitative reasoning skills.
3. Empowering creatively and critically to analyze scientific problems.
4. Bringing the knowledge gained and making the connection between theoretical knowledge taught in textbooks/homework problems.

etc.,

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. Concern the fundamentals in the basic areas of physics (Energy, Work, Power, Simple Harmonic Motion, Wave Motion Density, Pressure, Viscosity, and Stress and Strain).
2. Derive, and proving equations that describe physics topics.
3. Analyse physical insight into various physical problems.
4. Understand of how energy (heat or mass) transfers, to reveal the underlying physical principals.

etc.,

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. Acquire the skills to apply principles to new problems.
2. Use Physics to predict and estimate practical situations.
3. Solve problems competently by identifying the essential parts of a problem and formulating a strategy for solving the problem.
4. Apply appropriate techniques to arrive at a solution, and interpret the results.
5. Explain the physics problem and its solution in both words and appropriately specific equations to both experts and non-experts.

etc.,

Teaching/learning methods

1. Lectures.
2. Class problem solving.
3. Video lectures
4. Online discussion

etc.,

Assessment methods

1. Homework problem.

2. Monthly exam.
3. Quizzes.

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. best methods to study natural sciences
2. Critical Thinking
3. Analytical methods in solving problems.

etc.,

Teaching/learning methods

1. Brain storming.
2. Encourage Critical thinking.
3. Encourage analytical thinking strategy.
4. Introduce correct research methodologies.

etc.,

Assessment methods

1. Exams.
2. Student feedback.
3. Problem recognition type.
4. Assessing skill in problem solving.

etc.,

D. Life learning outcomes: Upon completion of the course, students should be able to:

1) Work within teams
2) Write academic reports
3) Analyse and verify scientific facts
4) Plan and organize time of study
5) Initiate new ideas and motivate others
6) conduct targeted searches of scholarly literature.

etc.,

10. Grading

1. Quizzes (2 X 4)	8 %
2. Discussion (1 X 5)	5 %
3. Monthly Exams (2 X 6)	12 %
4. Home Works (1 X 5)	5 %
5. Final Exam	70 %

11. Course Content

Week No.	No. of hours	Reference	Topic
1 - 4	**8**	Physics for Scientists and Engineering with modern Physics,Raymond A. Serway., SAUNDERS GOLDEN SUNBRUST SERIES , SAUNDERS COLLEGE PUBLISHING , 2004.	**Work, Energy and Power**
5	**2**	-	**Lessons Review + Quiz**
6 - 9	**8**	Fundamentals of Physics, Binder Ready Version 10th Edition David Halliday, Robert Resnick ,Jearl Walker Wiley; 10 edition 2013	**Simple Harmonic Motion**
10	**2**	-	**Lessons Review + Monthly Exam**
11 - 14	**8**	The Physics of Vibrations and Waves H.J. Pain John Wiley & Sons, Sussex 1999	**Wave Motion**
15	**2**	-	**Lessons Review + Quiz**
16 - 19	**8**	Physical Chemistry,R. A. Silbey, R. A. Alberty, M. G. Bawendi, Wiley & Sons, 2005.	**Fluids**
20	**2**	-	**Lessons Review + Quiz**
21 - 24	**8**	Physics for scientists and engineering R. Serway; Brooks Cole ; (9 edition or any recent edition) 2013	**Surface Tension**
25	**2**	-	**Lessons Review + Monthly Exam**
26 -29	**8**	Fundamentals of Statistical and Thermal Physics, Reif F.Mc Graw Hill, Int. Edition, Physics Series , USA. 1985	**Heat Transfer**
30	**2**	-	**Lessons Review + Quiz**

12. References

1. Textbooks

1. Physics for Scientists and Engineering with modern Physics,Raymond A. Serway., SAUNDERS GOLDEN SUNBRUST SERIES , SAUNDERS COLLEGE PUBLISHING , 2004.
2. Fundamentals of Physics, Binder Ready Version 10th Edition David Halliday, Robert Resnick ,Jearl Walker Wiley; 10 edition 2013
3. Physics for scientists and engineering R. Serway; Brooks

	Cole ; (9 edition or any recent edition) 2013 4. The Physics of Vibrations and Waves H.J. Pain John Wiley & Sons, Sussex 1999 **etc.,**
2. References	1. Physical Chemistry,R. A. Silbey, R. A. Alberty, M. G. B awendi, Wiley & Sons, 2005. 2. Fundamentals of Statistical and Thermal Physics, Reif F. Mc Graw Hill, Int. Edition, Physics Series, USA. 1985 **etc.,**
3. Electronic/ Online references (Available upon request)	**https://www.mechanicaltutorial.com/simple-harmonic-motion-objective-questions-and-answers** **https://www.mechanicaltutorial.com/applied-mechanics-objective-questions-and-answers-03** **etc.,**

13. Course improvement plan

1. Inserting the Practical side to make the theoretical side more understandable.
2. Inserting the electronic education as a basic activity.
3. Providing modern textbooks.

etc.,

Republic of Iraq

Ministry of Higher Education and Scientific Research

AL-Farabi University Collage

Petroleum Engineering Department

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

وصف مقرر مادة اللغة العربية

وصف المنهج:

وضِعَ هذا المنهج لتزويد الطلاب بقواعد اللغة العربية النحويَّة والإملائيَّة ، وكذلك تدريب الطلاب على استخدام قواعد اللغة العربية أثناء القراءة والكتابة والتعبير ، وتطبيقها على النصوص الشعريَّة والنثريَّة

1. المؤسسة التعليمية	كلية الفارابي الجامعة
2.القسم العلمي	هندسة نفط
3. اسم / رمز المقرر	اللغة العربية
4. نوع المحاضرة	الكتروني
5. الفصل / السنة	الفصل الأول / 2021
6الساعات المعتمدة	6ساعات أسبوعيا
7. اسم التدريسي	م.م الاء عبد القادر خلف محمود

8. أهداف المقرر

في نهاية الفصل الاول سيتمكن الطلاب من :

1. معرفة الطلاب للقواعد الاملائيَّة الأساسيَّة للغة العربيَّة.
2. معرفة الطلاب للقواعد النحويَّة الأساسيَّة للغة العربيَّة .
3. تطبيق الطلاب لِتلكَ القواعد على النصوص الشعريَّة والنثريَّة.

9. مخرجات المقرر وطرائق التعليم والتعلم

أ- المخرجات المعرفية :
1. المعرفة .
2.الفهم (الاستيعاب).
3.التطبيق.
4.التحليل.
5. التركيب.
6. التقويم.
ب - المخرجات المهاراتية الخاصة بالمقرر:
1. معرفة الطالب بقواعد اللغة العربية الاملائية والنحوية .
2. تطبيق تلك القواعد بالشكل المطلوب .

ب - المخرجات المهاراتية الخاصة بالمقرر:
1. معرفة الطالب بقواعد اللغة العربية الاملائية والنحوية .
2. تطبيق تلك القواعد بالشكل المطلوب .
ج- المخرجات الوجدانية والقيمية:
1. أن يحب الطالب مادة اللغة العربية.
2 . أن يحب الطالب اسلوب مدرس اللغة العربية في عرض المادة الدراسية .
3. أن يتفاعل الطالب مع طريقة عرض المادة الدراسية من قِبَل مدرس المادة

10. استراتيجيات التدريس للمقرر
1. طرائق التعليم والتعلم :
(المحاضرة والمناقشة والاستجواب).
2. طرائق التقييم :
1. الاختبارات الشفهية .
2. الاختبارات التحريرية (المقالية والموضوعية).

10.محتوى المقرر

	اسم الوحدة أو الموضوع	الساعات	الاسبوع
	همزة الوصل وهمزة القطع	2	1
	الهمزة الوسطى	2	2
	علامات الترقيم	2	3
	الفعل وأنواعه في اللغة العربية	2	4
	جزم الفعل المضارع	2	5
	كان وأخواتها	2	6
	جمع المذكر السالم وما يلحق به	2	7
	جمع المؤنث السالم وما يلحق به	2	8
	التاء الطويلة والتاء المربوطة	2	9
	المبتدأ والخبر	2	10
	الفاعل	2	11
	ان وأخواتها	2	12
	الأفعال الخمسة	2	13
	الأسماء الخمسة	2	14
	المفعول المطلق	2	15

11. المصادر والمراجع

1. الوجيز في قواعد الاملاء والانشاء ، تأليف : عبدالله أنيس الطباع و د. عمر أنيس الطباع
2 . النحو العربي أحكام ومعان ، تأليف : محمد فاضل السامرائي.
3. الموجز في قواعد اللغة العربية ، تأليف : د. سعيد الأفغاني .

11. خطة تطوير المقرر الدراسي

1. التطوير على المحتوى الدراسي بالحذف والاضافة والاستبدال .

2- استعمال طرائق تدريسية حديثة حسب طبيعة المادة ومستوى الطلبة بين الحين والاخر.

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جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

(1st year ENGLISH LANGUAGE)

Syllabus

Course Description: course include a complete revision on the language the students have studied in their past studies.

1. Institution Name	Al-Farabi University College
2. Department Name	Petroleum Engineering Department
3. Course Code & Name	English language - GE110
4. Lecture Type	Theoretical lectures
5. Semester/Year	Year
6. No. of credit hours	1
7. Instructor Name	Dr. Zuhair D. AL shaikh

8. Course Objectives:

1. To enable first year students to read and write suitable sentences.
2.
3.
4.

etc.,

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. To enable first year students to read and write suitable sentences
2.
3.

etc.,

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. To write a reasonable composition.
2.
3.
4.

etc.,

Teaching/learning methods All methods

1. Lectures.
2. Class problem solving.

3. Discussion

4.

etc., د

Assessment. (All methods)

1. homework problem sets,
2. exams
3. lab reports
4.

etc.,

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. **best methods to study natural sciences**

Teaching/learning methods (as above)

1.
2.
3.
4.

etc.,

Assessment methods (as above)

1.
2.
3.
4.

etc.,

D. Life learning outcomes: Upon completion of the course, students should be able to: (

1. **As above**
2.
3.
4.

etc.,

10. Grading

1. **30% yearly**
2. **70 % final exam**

2.

3.

4.

etc.,

11. Course Content

Week No.	No. of hours	Reference	Topic
1	10	1	From unit one to unit five
2			
3			
4			
5			
6			From unit six to unit fourteen
7			
8			
9			
10			
11			
12			
13			
14			
15			

12. References

1. Textbooks	1. Headway plus (bigger students books) by John and Liz Soars 2. 3. etc.,
2. References	1. 2. 3. etc.,
3. Recommended readings	
4. Electronic/ Online references (Available upon request)	1. 2. 3. etc.,

13. Course improvement plan

1.
2.
3.
4.
etc.,

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جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

(Static and Dynamic)

Syllabus

Course Description:

Part I Statics

(principles of statics, moment, Resultants of force systems, friction, centers of gravity, moment of inertia)

Part II Dynamics

(Principles of Dynamics, Rectilinear motion, Curvilinear motion, Rotation, Energy and work, mechanical vibration)

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**GE108 Static and Dynamic**
4. Lecture Type	**3 hr /wk**
5. Semester/Year	**year**
6. No. of credit hours	**3 hours**
7. Instructor Name	**M.Sc. Marwa Hassan Ibrahim Al-bayati**

8. Course Objectives:

1. To develop an understanding of the fundamentals and principles of engineering mechanics: statics and dynamics of particles and rigid bodies in two and three dimensions including: kinematics and kinetics of particles and rigid bodies in 2D and 3D motion, rotations, translations, oscillations.
2. Learn to solve equilibrium of rigid bodies including the calculations of moment of force, inertia moments of solid bodies, and basic structural analysis, and be able to determine the requirement for the equilibrium of particles and solid bodies.
3. To develop the ability to apply Newtonian mechanics to model and predict the responses of simple dynamical system (particle and rigid body) subjected to applied forces.

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. **To develop problem solving skills in engineering mechanics through the application of concepts in statics and dynamics to complex problems.**

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. **To familiarize the student with the skills required in their workplace as petroleum engineers**
2. **the student can link topics and choose the appropriate**

Teaching/learning methods (put your methods of teaching)

1. Lectures.
2. Class problem solving.
3. Discussion

Assessment methods(write your assessment methods)

1. **homework problem sets,**
2. **exams**

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. **best methods to study natural sciences**
2. **Critical Thinking**
3. **Analytical methods in solving problems**

Teaching/learning methods

1. Brain storming
2. Encourage Critical thinking
3. Encourage analytical thinking strategy
4. Introduce correct research methodologies

Assessment methods

1. Exams
2. Student feedback
3. body language

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. Work within teams
2. Write academic reports
3. Analyse and verify scientific facts
4. Plan and organize time of study
5. Initiate new ideas and motivate others
6. conduct targeted searches of scholarly literature.

10. Grading

1. Quizzes 10%
2. E-learning participation 5%
3. Midterm exam 15%
4. Final 70%

11. Course Content

Week No.	No. of hours	Reference	Topic
1	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	General principles; Newton's laws
2	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Newton's laws; Vectors and Forces
3	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Vectors and Free-Body Diagrams (FBD)
4	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Resultant Forces
5	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Moment of a Force
6	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Moment of a Couple
7	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Equilibrium of a Rigid Body and 3D FBDs
8	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Friction
9	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Center of Gravity ,centroids, Composite bodies
10	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Moment of inertia, Radius of Gyration

11	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	quiz
12	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Midterm 1
13-14	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Principles of dynamic
15-17	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Rectilinear motion
17-18	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Curvilinear motion
19	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	projeciles
20-22	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	rotation
23	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	energy
24	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	work
25-26	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Mechanical vibration
27	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	quiz
28	3	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering	Midterm exam 2

12. References	
1. Textbooks	**1.** Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering. Edition/Copyright: 12th Publication date: 2010 Publisher: Pearson-Prentice Hall
2. References	Author: R.C. Hibbeler Title: Engineering Mechanics: Statics and Dynamics Combination Study Package with MasteringEngineering. Edition/Copyright: 12th Publication date: 2010 Publisher: Pearson-Prentice Hall
3. Recommended readings	**Author: J.L. Meriam & L.G. Kraige** **Title :engineering mechanics statics** **Seven edition** **Publication date: 2012**
4. Electronic/ Online references (Available upon request)	**1.** **2.** **3.** **etc.,**

13. Course improvement plan

1. the course syllabus has been changed to be more simplified in terms of scientific theories and problems, keeping the same topics to be discussed and analyzed.

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

Republic of Iraq

Ministry of Higher Education and Scientific Research

AL-Farabi University Collage

Petroleum Engineering Department

Computer programming I

Course Description:

1. **Elements of a computer.**
2. **Windows system(history, elements, functions, applications, special types)**
3. **Microsoft office:(word, excel, power point)**
4. **Internet:(types of networks, search tools, method of search, E-mail, web page).**

1. Institution Name	Al-Farabi University College
2. Department Name	Petroleum engineering
3. Course Code & Name	GE104 Computer Programming I
4. Lecture Type	4 hr /wk
5. Semester/Year	year
6. No. of credit hours	4 hours
7. Instructor Name	M.Sc. Marwa Hassan Ibrahim Al-bayati

8. Course Objectives

1. Learning objectives include
o Computer Components
o Programming planning and documentation
o Data types and basic mathematical operations
o Structured programming

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. demonstrate the ability to communicate in a professional manner.
2. exhibit the ability to work in terms / groups effectively.

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. To familiarize the student with the skills required in their workplace as petroleum engineers
2. the student can link topics and choose the appropriate

Teaching/learning methods (put your methods of teaching)

1. Lectures.
2. Class problem solving.
3. Discussion

Assessment methods (write your assessment methods)

1. homework problem sets,
2. exams

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. best methods to study natural sciences
2. Critical Thinking
3. Analytical methods in solving problems

Teaching/learning methods

1. Brain storming
2. Encourage Critical thinking
3. Encourage analytical thinking strategy
4. Introduce correct research methodologies

Assessment methods

1.Exams
2. Student feedback
3. body language

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. Work within teams
2. Write academic reports
3. Analyse and verify scientific facts
4. Plan and organize time of study
5. Initiate new ideas and motivate others
6. conduct targeted searches of scholarly literature.

10. Course Content

Week No.	No. of hours	Reference	Topic
1	4		Elements of a computer.
2-4	4		Windows system(history, elements, functions, applications, special types)
5-9	4		Microsoft office: word
10-14	4		excel
15-19	4		Power point
20	4		quiz
21	4		Midterm 1
22-23	4		Internet: types of networks
24	4		search tools
25	4		Method of search
26	4		E- mail
27	4		Web page
28	4		Quiz
29	4		Midterm 2

11. References

1. Textbooks	
2. References	**FUNDAMENTALS OF COMPUTER STUDIES, by Jeleel Adekunle** **Publication date :2013** **https://cse.unl.edu/~cbourke/ComputerScienceOne.pdf** **internet by laura lambert; chris woodford; Hilary W. poole;**

	moschovitis **publication date:2005** **v. 1-3** **computer sciences by roger Flynn** **publication date: 2000** **v. 1-4**
3. Recommended readings	
4. Electronic/ Online references	

12. grading
Quizzes 10%
E-learning participation 5%
Midterm exam 15%
Lab. 20%
Final 50%

13. Course improvement plan

1. the course syllabus has been changed to be more simplified in terms of scientific theories and problems, keeping the same topics to be discussed and analyzed.

Ministry of Higher Education

AL-Farabi University Collage

Petroleum Engineering Department

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

Mathematics II

Syllabus

1. **Polar coordinates** (graphs in Polar coordinates, arc length and areas in Polar coordinates).
2. **Vectors in two and three space** (cross products, vector valued functions, motion along curves, differentiation and integration of vector valued functions).
3. **Infinite sequences and series** (divergence and convergence of series, Taylor and McLaurin series).
4. **Functions of more than one variable** (partial differentiation, extreme values, gradients, Lagrange multiplier).
5. **Multiple integrals**, change of order.
6. **Change from Cartesian to polar coordinates**.
7. **First order differential equations.**
8. **Introduction to second order differential equations**

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**GE202 Mathematics II**
4. Lecture Type	**Hard and Soft**
5. Semester/Year	**Annual / 2020-2021**
6. No. of credit hours	**120 hr (4 hr/week)**
7. Instructor Name	**Assistant Lecturer Tiba Nayyef Jasim**

8. Course Objectives:

1. Understanding, predicting and optimizing engineering systems that deterministic and are modeled using differential equations.
2. Providing an introduction to differential equations and their solutions and statistics.
3. Bringing the knowledge gained and making the connection between theoretical knowledge taught in textbooks/homework problems.

etc.,

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. Know and demonstrate understanding of the concepts in an important subjects of mathematics (Polar Coordinates, Vectors, Infinite Series, Partial Differentiation, Multiple Integrals, First and Second Order Differential Equations).
2. Develop the knowledge, skills and attitudes necessary to pursue further studies in mathematics.
3. Present mathematical solutions and informative manner.
4. Use appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts.

etc.,

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. Apply statistical analysis of a variety of experimental and observational studies.
2. Derive mathematical models of physical systems.
3. Solve differential equations using appropriate methods.

etc.,

Teaching/learning methods

1. Lectures.
2. Class problem solving.
3. Video lectures
4. Online discussion

etc.,

Assessment methods

1. Homework problem.
2. Monthly exam.
3. Quizzes.

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. Selecting and applying general rules correctly to solve problems including those in real-life contexts.
2. Developing mathematical curiosity and use inductive and deductive reasoning when solving problems.
3. Analytical methods in solving problems.

etc.,

Teaching/learning methods

1. Brain storming.
2. Encourage Critical thinking.
3. Encourage analytical thinking strategy.
4. Introduce correct research methodologies.

etc.,

Assessment methods

1. Exams.
2. Student feedback.
3. Problem recognition type.
4. Assessing skill in problem solving.

etc.,

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. Think critically, research and reason.
2. Apply analytical and theoretical skills to model and solve mathematical problems.
3. Analyse data and draw appropriate statistical conclusions.

etc.,

10. Grading

1. Quizzes (2 X 4)	8 %
2. Discussion (1 X 5)	5 %
3. Monthly Exams (2 X 6)	12 %
4. Home Works (1 X 5)	5 %
5. Final Exam	70 %

11. Course Content

Week No.	No. of hours	Reference	Topic
1 - 4	16	Calculus 008 Edition, Kindle Edition by James Stewart	Polar Coordinates
5	4	-	Lessons Review + Quiz
6 - 9	16	Thomas' Calculus 14th Edition by Joel Hass, Christopher Heil, Maurice Weir	Vectors in Two and Three Dimensional Space
10	4	-	Lessons Review + Monthly Exam
11 - 14	16	Thomas' Calculus 14th Edition by Joel Hass, Christopher Heil, Maurice Weir	Differential Equations
15	4	-	Lessons Review + Quiz
16 - 19	16	Thomas' Calculus 14th Edition by Joel Hass, Christopher Heil, Maurice Weir	Infinite Sequences and Series
20	4	-	Lessons Review + Quiz
21 - 24	16	Calculus 008 Edition, Kindle Edition by James Stewart	Multiple Integration
25	4	-	Lessons Review + Monthly Exam
26 -29	16	Introduction to Differential Calculus Autor: Christopher Thomas Fuente: The University of Sydney	First and Second Differential Equations
30	4	-	Lessons Review + Quiz

12. References

1. Textbooks	1. Calculus 008 Edition, Kindle Edition by James Stewart. 2. Introduction to Differential Calculus, Christopher Thomas, Fuente: The University of Sydney etc.,
2. References	3. Thomas' Calculus 14th Edition by Joel Hass, Christopher Heil, Maurice Weir 4. Vector Algebra and Calculus: Stephen Roberts Fuente: University of Oxford 5. etc.,
3. Electronic/ Online references (Available upon request)	1. https://www.infobooks.org/free-calculus-books-pdf/ 2. https://people.math.harvard.edu/~shlomo/docs/Advanced_Calculus.pdf

13. Course improvement plan

1. Increasing the number of textbooks so that every student can have one.
2. Inserting the electronic education as an external activity.

etc.,

Ministry of Higher Education

AL-Farabi University Collage

Petroleum Engineering Department

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

(Structural & Oil Geology – 2nd year)

Syllabus

Course Description: Strength and deformation of rocks; the main sedimentary structures fields, fault, joints. Environment of sedimentation. Details of il formation, migration and accumulation; Subsurface maps of reservoirs and trap reservoir PVT.

1. Institution Name	Al-Farabi University College
2. Department Name	Petroleum Engineering Department
3. Course Code & Name	Structural & Oil Geology- PE200
4. Lecture Type	Direct to students
5. Semester/Year	Year
6. No. of credit hours	2 T , 2 P
7. Instructor Name	Dr. Zuhair AL Shaikh

8. Course Objectives:

1. Enable student to understand and interpret geological maps
2.
3.
4.

etc.,

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

1. Assessment of structural maps and interpretation
2.
3.

etc.,

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. Should be able to correlate between geological maps and the reservoir conditions they represent
2.
3.
4.

etc.,

Teaching/learning methods

1.
2.
3.
4.

etc.,

Assessment methods

1.
2.
3.
4.

etc.,

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. **Should be able to correlate between geological maps and the reservoir conditions they represent**
2.
3.
4.

etc.,

Teaching/learning methods

1.
2.
3.
4.

etc.,

Assessment methods

1.
2.
3.
4.

etc.,

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. **They should be able to use required references.**
2.
3.
4.

etc.,

10. Grading according to results in a number of tests

1. **Good**
2. **Medium**
3. **Fail**

etc.,

11. Course Content

Week No.	No. of hours	Reference	Topic
1	2		Essential of structural geology
2	2		Essential of structural geology
3	2		Essential of structural geology
4	2		Essential of structural geology
5	2		Essential of structural geology
6	2		Source, reservoir and cap rocks
7	2		Source, reservoir and cap rocks
8	2		Source, reservoir and cap rocks
9	2		Source, reservoir and cap rocks
10	2		Source, reservoir and cap rocks
11	2		Oil structure oil trap
12	2		Subsurface maps
13	2		Oil reservoirs
14	2		Iraq oil fields
15	2		Iraq oil fields

12. References

1. Textbooks	1. Structural Geology by De Sitter 2. Practical problems handouts 3. etc.,
2. References	1. Pet geology by Liverson 2. Subsurface Geological Methods by Leroy 3. etc.,
4. Electronic/ Online references (Available upon request)	1. 2. 3. etc.,

13. Course improvement plan

1. Adding one unit to the Theory
2.
3.
4.
etc.,

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جمهورية العراق

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كلية الفارابي الجامعة

قسم هندسة النفط

(English language)

Syllabus

Course Description:

The course involves the knowledge of the parts of speech tense ,kinds of sentences , passive voice and reported speech. Moreover, course includes reading and pronunciation , solving various exercises from text books.

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**GE 110, English language**
4. Lecture Type	**Theoretical lectures**
5. Semester/Year	**Yearly**
6. No. of credit hours	**1 hr per week**
7. Instructor Name	**Muzahim Aziz Basi**

8. Course Objectives:

1. **Improving English speaking and pronunciation**
2. **Improving writing by using the grammar properly**
3. **Scientific and social communications in English language.**

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. **Write and read in English language properly.**
2. **Write scientific reports in English**
3. **Translate from English to Arabic and vise versa.**

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. **Communication with the people in English**
2. **Write and read in English language properly.**
3. **Translate from English to Arabic and vise versa.**

Teaching/learning methods

1. Lectures .
2. Solving exercises in the text book
3. Discussion

Assessment methods

1. **Exams**
2. **Oral quizzes**
3. **Written quizzes**
4. **Reading and pronunciation.**

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. **Best methods to study English language**
2. **Critical Thinking**

Teaching/learning methods

1. Brain storming
2. Encourage critical thinking

Assessment methods

1.exams
2. student feedback.

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. Work within teams
2. Write academic reports
3. Plan and organize time of study
4. Initiate new ideas and motivate others

10. Grading

1.Quizzes 10%
2. Medium exam 20%
3. Final exam 70%

11. Course Content

Week No.	No. of hours	Reference	Topic
1	1	Liz and John Soars Sylvia Wheeldon	Introduction
2	1	Liz and John Soars Sylvia Wheeldon	Types of sentences with examples
3	1	Liz and John Soars Sylvia Wheeldon	Types of sentences with examples
4	1	Liz and John Soars Sylvia Wheeldon	Active and passive with examples
5	1	Liz and John Soars Sylvia Wheeldon	Active and passive with examples
6	1	Liz and John Soars Sylvia Wheeldon	Preposition with examples
7	1	Liz and John Soars Sylvia Wheeldon	Phonetics with examples
8	1	Liz and John Soars Sylvia Wheeldon	Solving the exercises in page 6 and 7 (student book)
9	1	Liz and John Soars Sylvia Wheeldon	Solving the exercises in page 8 and 9 (student book)
10	1	Liz and John Soars Sylvia Wheeldon	Reading with pronunciation , people the great communicator and answering the questions. Student book p.11
11	1	Liz and John Soars Sylvia Wheeldon	Reading with pronunciation , people the great communicator and answering the questions. Student book p.11
12	1	Liz and John Soars Sylvia Wheeldon	Reading with pronunciation , the way we live. Student book p.14
13	1	Liz and John Soars Sylvia Wheeldon	Monthly examination
14	1	Liz and John Soars Sylvia Wheeldon	Solving exercises in p.17 with discussion.
15	1	Liz and John Soars Sylvia Wheeldon	Review

12. References

1. Textbooks	1.work book 2.Student book
2. References	1. 2. 3. etc.,

3. Recommended readings	
4. Electronic/ Online references (Available upon request)	**1.** **2.** **3.** **etc.,**

13. Course improvement plan

English language laboratory is necessary for all the students learning English .

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كلية الفارابي الجامعة

قسم هندسة النفط

(Fluids Mechanics)

Syllabus

Course Description

Initially, in this course, students will be introduced to the systems of units and its dimensions that used to describe physical quantities , also it's aim to introduce students to the properties of fluids (real, ideal , Newtonian ,non- Newtonian, etc). The student will be able to identify the static forces, pressure and location of the centre of static forces also, the students will be introduced to the forces that lead to the movement of fluid. The student will be able to study and classify the flow in pipes, study the energy loss of flow, as well as pressure and flow measurement apparatuses.

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**GE 208Fluid Mechanics**
4. Lecture Type	**4-hr lecture/week +lab**
5. Semester/Year	**year**
6. No. of credit hours	**4+2hour lab second half of year**
7. Instructor Name	**M.Sc. Dalia Basel Abed al-tememe**

8. Course Objectives:

1-The student is able to understand the behavior of fluids according to their properties and use them appropriately.
2- The student will be able to calculate the flow energy in the real and ideal fluid.
3- Calculation of the forces acting on objects that touch the movement of fluids.
4-The student is able to calculate the loss in real flow energy.
5- The student will be able to calculate the power of pumps or turbines and the method of connecting the tank network.

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. The student is prepared to receive a good scientific subject.
2. The student learns how to benefit from linking topics with equations and solving them.
3. The student learns how to apply what has been taken from scientific materials.
4. Identifying how to apply the practical aspects to the potential problems facing the petroleum engineering.
5. Consolidating the scientific material correctly by doing exams.
6. Activating the student's role in understanding and benefiting from this material to the fullest extent.

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. To familiarize the student with the skills required in their workplace as petroleum engineers.
2. the student can link topics and choose the appropriate.

Teaching/learning methods (put your methods of teaching)

1. Lectures.
2. Class problem solving.
3. Discussion

Assessment methods(write your assessment methods)

1. homework problem sets,
2. exams
3. lab reports
4. Quizzes

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. best methods to study natural sciences
2. Critical Thinking
3. Analytical methods in solving problems

Teaching/learning methods

1. Brain storming
2. Encourage Critical thinking
3. Encourage analytical thinking strategy
4. Introduce correct research methodologies

Assessment methods

1.Exams
2. Student feedback
3. body language
4. Discussions and presentations

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. Work within teams
2. Write academic reports
3. Analyse and verify scientific facts
4. Plan and organize time of study
5. Initiate new ideas and motivate others
6. conduct targeted searches of scholarly literature.

10. Grading

Quizzes (3 X 3)	10%
E-learning participation	5%
Monthly exam	10%
Home works	5%
Laboratory	%10
Final exam	60%

11. Course Content

Week No.	No. of hours	Reference	Topic
1	4		Dimensions and units
2	4		Basic concepts and units, Fluid properties
3	4		Newton's low of viscosity
4	4		Non-Newtonian fluids, dimensional analysis
5	4		Dimensional analysis
6	4		Quiz1, static pressure
7	4		Static pressure and measuring pressure apparatus
8	4		measuring pressure apparatus, Quiz
9	4		Static forces on horizontal and vertical planes
10	4		Static forces on inclined surfaces
11	4		Static forces on inclined surfaces
12	4		Quiz2, solving problem sheets
13	4		Monthly exam, kinematic fluids
14	4		Types of flow
15	4		Types of flow, quiz3
16 (second half of year)	4+2lab		Dynamic flow and types of flow (laminar and turbulent flow)
17	4+2 lab		Continuity and Bernoulli equation
18	4+2 lab		Bernoulli equation and its modification and its applications
19	4+2 lab		Bernoulli's equation applications
20	4+2 lab		Quiz1, Flow measurements
21	4+2 lab		Flow measurements
22	4+2 lab		Quiz2, Flow in pipes and velocity distribution
23	4+2 lab		Friction losses and its types
24	4+2 lab		Losses in valves and fittings
25	4+2 lab		Moody chart, solving problem sheet
26	4+2 lab		Quiz 3, monthly exam2
27	4+2 lab		pumps
28	4+2 lab		pumps
29	4+2 lab		Two phase flow
30	4+2 lab		Solving problem sheet

12. References

1. Textbooks	
2. References	**- Coulson, J.M. and J.F. Richardson, "Chemical Engineering ," Vol.I " Fluid Flow, Heat Transfer, and Mass Transfer" 5th edition , .(1998)** **-Holland, F.A. "Fluid Flow for Chemical Engineers" Arnold , .(1980)** **-Shariff, A. "Hydaulics and Fluid Mechanics" Dhanpatrai and Sons, (1987).** **-Christi J. Geankoplis "Transport Processes and Unit Operations " 3rd edition Printice Hall International Ediitions, (1993).** **-McCabe, W.L., Smith, J.C., and Harriott, P. " Unit Operations of Chemical Engineering" 6th edition McGraw-Hill International Edition, (2001).** **-Khurmi, R.S. "A Text Book of Fluid Mechanics" 4th edition S.Chand & Company (Pvt.) LTD, (1987).**
3. Recommended readings	**2500 solved problems in fluid mechanics and hydraulics / by Jack B. Evett, Cheng Liu. p. cm. - (Schaum's solved problems series). ISBN 0-07-019783-0**
4. Electronic/ Online references (Available upon request)	

13. Course improvement plan

The course syllabus has been changed to be more simplified in terms of scientific theories and problems, keeping the same topics to be discussed and analyzed.

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جمهوريه العراق

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كلية الفارابي الجامعة

قسم هندسة النفط

(Strength of Materials)

Syllabus

Course Description

Initially, in this course, students will be introduced to the systems of units and its dimensions that. Which are considered as the basis of the strength of material, also its aim to introduce students the strength of materials (stress, strain, bearing, modulus of elasticity, etc.). In any engineering structure will be subjected to external forces arising from the environment in which the component works. If the component or member is in equilibrium, the resultant of the external forces will be zero but, nevertheless, they together place a load on the member which tends to deform that member and which must be reacted by internal forces which are set up within the material. If a cylindrical bar is subjected to a direct pull or push along its axis, then it is said to be subjected to tension or compression.

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1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**Strength of Materials**
4. Lecture Type	**5-hr lecture/week +lab**
5. Semester/Year	**semester**
6. No. of credit hours	**4+2hour lab second half of year**
7. Instructor Name	**M.Sc. Azhar ayyed marza alzubaidy**

8. Course Objectives:

1- The student is able to understand the what do you mean strength of material from according to their properties and use them appropriately.
2-The student will be able to calculate the stress in each section of the bar.
3-Calculation the deformation force per unit area of the material. It is associated with the strain. .
4-The student tensile Stress: Is like pulling or expansion the object on each side or might one side.
5- The student loads are proportional to the stresses they produce, and deformations are proportional to the strains, this also implies that, while materials are elastic, stress is proportional to strain.

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. The student is prepared to receive a good scientific subject.
2. The student learns how to benefit from linking topics with equations and solving them.
3. The student learns how to apply what has been taken from scientific materials.
4. Identifying how to apply the practical aspects to the potential problems facing the petroleum engineering.
5. Consolidating the scientific material correctly by doing exams.
6. Activating the student's role in understanding and benefiting from this material to the fullest extent.

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. To familiarize the student with the skills required in their workplace as petroleum engineers.
2. the student can link topics and choose the appropriate.

Teaching/learning methods (put your methods of teaching)

1. Lectures.
2. Class problem solving.
3. Discussion

Assessment methods(write your assessment methods)

1. homework problem sets.
2. exams.
3. lab reports and discussion.
4. Quizzes.

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. best methods to study natural sciences
2. Critical Thinking
3. Analytical methods in solving problems

Teaching/learning methods

1. Brain storming
2. Encourage Critical thinking
3. Encourage analytical thinking strategy
4. Introduce correct research methodologies

Assessment methods

1.Exams
2. Student feedback
3. body language
4. Discussions and presentations

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. Work within teams
2. Write academic reports
3. Analyses and verify scientific facts
4. Plan and organize time of study
5. Initiate new ideas and motivate others
6. conduct targeted searches of scholarly literature.

10. Grading

Quizzes (3 X 3)	5%
E-learning participation	5%
Monthly exam	10% Home
works	10%
Laboratory	%20
Final exam	50%

11. Course Content

Week No.	No. of hours	Reference	Topic
1	4		Dimensions and units
2	4		Load, loading types, Stress and Strain, Hooke's law and Young's Modulus and. Ductile and Brittle Materials
3	4		Poisson's Ratio, Shear stress, Shear strain, Bearing Stress and Modulus of rigidity.
4	4		Stresses in thin cylinders and pressure vessels, Tangential Stress σt (Circumferential Stress), Longitudinal Stress, σL and Thermal Stresses.
5	4		Torsion, Simple Torsion Theory, Shear Stress and Shear Strain in Shafts, Composite Shafts-Series Connection and Composite Shafts-Parallel Connection
6	4		Shearing Force and Bending Moment, Sign Convention for Forces and Moments, Type of supports, Types of Beams and Load Types on Beams.
7	4		Shear force diagram and bending moment diagram.
(Lab.)	2lab		Tensile Test
(Lab.)	2 lab		Compression Test
(Lab.)	2 lab		Torsion
(Lab.)	2 lab		Bending moment
(Lab.)	2 lab		Impact test

12. References

1. Textbooks	
2. References	http://engineeringstudymaterial.net/ebook/strength-of-materials-by-stephen-timoshenko/ , http://engineeringstudymaterial.net/ebook/mechanics-of-materials-by-ferdinand-beer-russell/ , http://engineeringstudymaterial.net/ebook/mechanics-of-materials-by-james/ , http://engineeringstudymaterial.net/ebook/mechanics-of-materials-by-rc-hibbeler/ .
4. Electronic/ Online references (Available upon request)	

13. Course improvement plan

The course syllabus has been changed to be more simplified in terms of scientific theories and problems, keeping the same topics to be discussed and analyzed.

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كلية الفارابي الجامعة

قسم هندسة النفط

(Thermodynamics)

Course Description: Teaching the student what is thermodynamics, as well as how heat transferred from body's and walls, the meaning of temperature, heat, the first law of thermodynamics, the second law of thermodynamics, Charles' law, Boyles' law, and ideal gas.

1. Institution Name	Al-Farabi University College
2. Department Name	Petroleum Engineering Department
3. Course Code & Name	Thermodynamics- PE203
4. Lecture Type	Theoretical
5. Semester/Year	Semester
6. No. of credit hours	16 hours
7. Instructor Name	Azhar ayeed marza

8. Course Objectives:

1. **Learn how heat is transferred from body's**
2. **Determine of the thermal conductivity of body's**
3.
4.

etc.,

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

1. Understand the meaning of thermodynamics and what are its laws and how study heat transfers.
2. Student test by homework and problem to solve by himself and Question the student during the lecture and quiz
3.
4.

etc.,

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. **Specific heat, thermal conductivity, thermal expansion and volume expansion of solids**
2. **First law of thermodynamics, some special cases of the first law (the gasoline engine, the ideal heat engine, the Carnot cycle).**
3. **The second law of thermodynamics: heat engine and the second law, refrigeration and entropy.**
4.

etc.,

Teaching/learning methods

1. Lectures.
2. Class problem solving.
3. Discussion.
4.
etc.,

Assessment methods

1. **Homework problem sets.**
2. **Exams.**
3. **Lab reports.**
4.

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. **Best methods to study natural sciences.**
2. **Critical Thinking.**
3. **Analytical methods in solving problems.**
4.

etc.,

Teaching/learning methods

1. **Brain testing.**
2. **Encourage Critical thinking.**
3. **Encourage analytical thinking strategy.**
4. **Introduce correct research methodologies.**

etc.,

Assessment methods

1. **Exams.**
2. **laboratory reports / studies.**
3. **Student feedback.**
4.

etc.,

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. **Work within teams.**
2. **Write academic reports.**
3. **Analyse and verify scientific facts.**
4. **Plan and organize time of study.**
5. **Initiate new ideas and motivate others.**
6. **conduct targeted searches of scholarly literature.**

11. Course Content

Week No.	No. of hours	Reference	Topic
1	3	YunusA.Cengel	Temperature and heat
2	3	Yunus A. Cengel , and Michael A. Boles	First law of thermodynamics, some special cases of the first law (the gasoline engine, the ideal heat engine, the Carnot cycle).
3	3	Yunus A. Cengel , and Michael A. Boles eighth edition, McGraw Hill education, 2011	The second law of thermodynamics: heat engine and the second law, refrigeration and entropy.
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

12. References

1. Textbooks	1. 2. 3. etc.,
2. References	1. Yunus A. Cengel. 2. Michael A. Boles. 3. eighth edition. 4. McGraw Hill education, 2011.

	etc.,
4. Electronic/ Online references (Available upon request)	**1.** **2.** **3.** **etc.,**

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كلية الفارابي الجامعة

قسم هندسة النفط

Fundamentals of Petroleum Engineering

Syllabus

Course Description: **Fundamentals of Petroleum Engineering is a subject that introduces the student to origin of petroleum and the basic elements in petroleum engineering and its branches, such as production, reservoirs, drilling, wells logging, oil exploration, and fields in the country, giving them meanings basics and an overview that qualifies them to prepare for a specialization**

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**Fundamentals of Petroleum Engineering- PE206**
4. Lecture Type	**theoretical**
5. Semester/Year	**Yearly**
6. No. of credit hours	**3 hrs- 4 units**
7. Instructor Name	**Asst. Lect. Ahmed A. Khudhair**

8. Course Objectives:

1 .Elements of petroleum engineering

2 .Origin of petroleum

3 .Reservoir rock properties and fluid distribution

4 .Volumetric calculation of oil in place

5 .Natural forces in oil and gas reservoirs

6 .Oil exploration

7 .Rotary drilling

8 .Rig components

9 .Cementing and well completion

10 .Well logging

11 .Surface equipment

12. Iraqi oil fields

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

Recognize oil terminology and deal with engineering basics from equations and methods of general calculations in petroleum engineering in various branches.

B. Skills Outcomes: Upon completion of the course, students should be able to:

1.
2.
3.
4.

etc.,

Teaching/learning methods

1.
2.
3.
4.

etc.,

Assessment methods

1.
2.
3.
4.

etc.,

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1.
2.
3.
4.

etc.,

Teaching/learning methods

1.
2.
3.
4.

etc.,

Assessment methods

1.
2.
3.
4.

etc.,

D. Life learning outcomes: Upon completion of the course, students should be able to:

The student shall be able to deal with the basic concepts of petroleum engineering and the ability to develop himself in any field

10. Grading

1.Quiz

2.Mid Exams

3.H.W

4.C.W **etc.,**

11. Course Content

Week No.	No. of hours	Reference	Topic
1	3		
2	3		
3	3		
4	3		
5	3		
6	3		
7	3		
8	3		
9	3		
10	3		
11	3		
12	3		
13	3		
14	3		
15	3		

12. References

1. Textbooks	**1. Reservoir Engineering Handbook** **2. Fundamentals of Petroleum and Petrochemical Engineering** **3. Drilling Engineering Handbook** **4. Petroleum Engineering Handbook - Volume 4** **5. Well Logging Handbook**
2. References	**1. Fundamentals of Petroleum and Petrochemical Engineering** **2. The Petroleum Engineering Handbook: Sustainable Operations**

13. Course improvement plan

Use and identify sources in various disciplines for reference when needed

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كلية الفارابي الجامعة

قسم هندسة النفط

(Computer Programming)

Syllabus

Course Description: Understand the concepts and terms used to describe languages, programming and solve problems using programming.

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**Computer programming- GE204**
4. Lecture Type	**Online and practical in laboratory.**
5. Semester/Year	**Year**
6. No. of credit hours	**3 hours (1 hour online,2 hours in laboratory)**
7. Instructor Name	**Akram Jabbar**

8. Course Objectives:

1. Learn to deal with computer programs
2. Learn how to write programs
3. Learn to how to solve problems by programs
4. Learn to how to convert mathematical expressions to programs

etc.,

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

1. Learn how to write programs
2. Learn to how to solve problems by programs
3.
4.

etc.,

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. solve problems by programs
2. convert mathematical expressions to programs
3.
4.

etc.,

Teaching/learning methods

1. online
2. practice in laboratory
3.
4.

etc.,

Assessment methods

1. home works
2. quizzes
3.
4.

etc.,

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. **Programs to solve problems.**
2. **Programs to simulate systems.**
3.

etc.,

Teaching/learning methods

1. **online video**
2. **practice in laboratory**
3.
4.

etc.,

Assessment methods

1. **Quizzes**
2. **Exams**
3. **Home works**
4. **Practical examinations**

etc.,

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. **Able to work with others to solve problems.**
2. **Apply knowledge that supports their academic and personal growth.**
3. **Seeks new information to solve problems or make informed decisions.**
4.

etc.,

10. Grading

1.exams 20%
2. home works 10%
3. quizzes 10%
4. practical examinations 10%
5. Final Exam 50%
etc.,

11. Course Content

Week No.	No. of hours	Reference	Topic
1	3	JOHN WILEY	Starting with MATLAB
2	3	JOHN WILEY	Elementary math built-in functions
3	3	JOHN WILEY	Creating Arrays
4	3	JOHN WILEY	Array Addressing
5	3	JOHN WILEY	Mathematical Operations with Arrays
6	3	JOHN WILEY	Element-by-element operations
7	3	JOHN WILEY	Two-Dimensional Plots
8	3	JOHN WILEY	Plotting multiple graphs in the same plot
9	3	JOHN WILEY	Plots with special graphics
10	3	JOHN WILEY	Putting multiple plots on the same page
11	3	JOHN WILEY	Programming in MATLAB
12	3	JOHN WILEY	Relational and logical operators
13	3	JOHN WILEY	Conditional statements
14	3	JOHN WILEY	The if-end Structure
15	3	JOHN WILEY	The if-else if-else-end Structure

12. References

1. Textbooks	**1.** **2.** **3.** **etc.,**
2. References	**1. MATLAB® "An Introduction with Applications",Fourth Edition, JOHN WILEY & SONS.** **2."Fortran for sciences and engineering" , Fourth Edition, Stephen J. Chapman** **3.** **etc.,**
4. Electronic/ Online references (Available upon request)	**1.** **2.** **3.** **etc.,**

13. Course improvement plan

1. Continuous review for every lecture of the course.
2. Check and review all course codes of programs.
3. Rearrange and redistributed the contains of course with respect to the weeks because the time some section of a course is insufficient to cover the course syllabus.
4.
etc.,

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قسم هندسة النفط

Petroleum Properties

Syllabus

Course Description:

Crude oils (chemical composition, classification, properties), density, specific gravity and coefficient of expansion, viscosity, molecular weight, vapor pressure, specific heat, latent heat, heat of combustion, boiling range, pour point, sulfur content, aniline point, penetration number, softening point, crude oil evaluation, fractional distillation and TBP curve, analysis of fraction, dehydration of crude oil, natural gas properties, oilfield water properties.

1. Institution Name	Al-Farabi University College
2. Department Name	Petroleum engineering
3. Course Code & Name	PE201 Petroleum properties
4. Lecture Type	4 hours per week
5. Semester/Year	Semester
6. No. of credit hours	4
7. Instructor Name	M.Sc. Marwa Hassan Ibrahim Al-bayati

8. Course Objectives

1. This article deals with the study of the most important physical and chemical properties of crude oil and some of its derivatives, in addition to natural gas, and Determine conformance to specifications of crude oil.

2 .Determine proper conditions for storing and transporting crude oil and its derivatives

3. Determination of the percentage of impurities

4. Thus, the evaluation of crude oil and its derivatives for the purposes of use and export, and the determination of the quality of the oil derivative

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1.demonstrate the ability to communicate in a professional manner.
2. exhibit the ability to work in terms / groups effectively.

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. To familiarize the student with the skills required in their workplace as petroleum engineers
2. That the student can link topics and choose the appropriate

Teaching/learning methods (put your methods of teaching)

1. Lectures.
2. Class problem solving.
3. Discussion

Assessment methods (write your assessment methods)

1. homework problem sets,
2. exams
3. lab reports

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. best methods to study natural sciences
2. Critical Thinking
3. Analytical methods in solving problems
4.

Teaching/learning methods
1. Brain storming 2. Encourage Critical thinking 3. Encourage analytical thinking strategy 4. Introduce correct research methodologies
Assessment methods
1.Exams 2. Student feedback 3. body language 4. laboratory reports / studies
D. Life learning outcomes: Upon completion of the course, students should be able to: 1. Work within teams 2. Write academic reports 3. Analyse and verify scientific facts 4. Plan and organize time of study 5. Initiate new ideas and motivate others 6. conduct targeted searches of scholarly literature.

10. Course Content

Week No.	No. of hours	Reference	Topic
1	2	Handbook of petroleum refinery	Crude oils (chemical composition, classification, properties)
2	2	Handbook of petroleum refinery	density, specific gravity
3	2	Handbook of petroleum refinery	coefficient of expansion, viscosity, molecular weight
4	2	Handbook of petroleum refinery	vapor pressure, specific heat, latent heat
5	2	Handbook of petroleum refinery	heat of combustion, boiling range
6	2	Handbook of petroleum refinery	pour point, sulfur content, aniline point
7	2	Handbook of petroleum refinery	penetration number, softening point
8	2	Handbook of petroleum refinery	crude oil evaluation, fractional distillation and TBP curve
9	2	Handbook of petroleum refinery	analysis of fraction, dehydration of crude oil
10	2	Handbook of petroleum refinery	natural gas properties
11	2	Handbook of petroleum refinery	oilfield water properties.
12	2		quizzes
13	2		Midterm exam
14			
15			

11. References

1. Textbooks	
2. References	Handbook of petroleum refinery Author: James G. Speight
3. Recommended readings	
4. Electronic/ Online references	

12. grading
Quizzes 10%
E-learning participation 5%
Midterm exam 15%
Lab 20%
Final 50%

13. Course improvement plan

1. the course syllabus has been changed to be more simplified in terms of scientific theories and problems, keeping the same topics to be discussed and analyzed

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كلية الفارابي الجامعة

قسم هندسة النفط

(petroleum engineering economics)

Syllabus

Course Description:

.1 Studying the important topics in economic.

.2 Understanding the classification of types of contract.

.3 Project evaluation.

.4 risk of reserve estimation.

5. income calculation of petroleum projects.

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**petroleum engineering economics- PE308**
4. Lecture Type	**Theoretical lectures**
5. Semester/Year	**year**
6. No. of credit hours	**2**
7. Instructor Name	Ahmed Jubair Mahmood

8. Course Objectives:

1. Studying the important topics in economic.
2. Understanding the classification of types of contract .
3. Project evaluation.
4. risk of reserve estimation.
5. income calculation of petroleum projects.

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

Knowledge Outcomes: Upon completion of the course, students should be able to:

1. Classifying of contracts.
2. present day value calculation.
3. income calculation of petroleum projects
4. feasibility study.

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. Deal with all kinds of contracts.
2. Perform calculations regarding present day value.
3. Make decisions about the execution of petroleum projects.

Teaching/learning methods (put your methods of teaching)

1. Lectures. √
2. Class problem solving. √
3. Discussion √

Assessment methods (write your assessment methods)

1. homework problem sets, √
2. exams √

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. best methods to study natural sciences √
2. Critical Thinking √
3. Analytical methods in solving problems √

Teaching/learning methods

1. Brain storming √
2. Encourage Critical thinking √
3. Encourage analytical thinking strategy √

Assessment methods

1.Exams √
2. Student feedback √

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. Work within teams
2. Write academic reports
3. Analyse and verify scientific facts
4. Plan and organize time of study
5. Initiate new ideas and motivate others

10. Grading

1.
2.
3.
4.
etc.,

11. Course Content

Week No.	No. of hours	Reference	Topic
1	2		Review of the important topics and definitions in economics.
2	2		Life cycle of petroleum projects
3	2		Contract Types of Petroleum Exploration and Production
4	**2**		continued
5	2		Investment Decisions
6	2		Evaluation of Petroleum Projects
7	2		Continued
8	**2**		Types of costs and cost calculation
9	2		continued.
10	2		Discount cash flow
11	2		continued
12	2		Petroleum Companies and Economics .
13	**2**		continued
14	2		continued
15	2		Exam.
16	2		Time value of money
17	2		Continued.
18	2		Solution of problems
19	2		Continuous Interest
20	2		continued
21	2		Risk in Petroleum Economics
22	2		continued.
23	2		Risk of Reserve Estimation in petroleum Engineering
24	2		Continued.
25	2		Solution of problems
26	2		Reserves Estimation .
27	2		coninued.
28	2		review

29	2		evaluation
30	2		Exams.

12. References

1. Textbooks	Abdel-Aal, H. & Alsahlawi, M. (2014). Petroleum economics & engineering, 3rd ed. USA: Taylor & Francis Group, LLC.
2. References	Babusiaux, D. & Pierru, A. (2005). Corporate investment & economic analysis: Exercises & case study, France: Editions Technip.
3. Recommended readings	Belli, P., Anderson, J., et al. (1998). Handbook on economic analysis of investment operating, USA: Operational Core Services Network Learning and Leadership Center of the World Bank.
4. Electronic/ Online references (Available upon request)	**1.** **2.** **3.** **etc.,**

13. Course improvement plan

1.
2.
3.
4.
etc.,

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كلية الفارابي الجامعة

قسم هندسة النفط

(Drilling Engineering I)

Syllabus

Course Description: (Write a Brief Description of the course)

Drilling engineering I : Is very important course for petroleum engineering , because it considered as the first step to learn and study the drilling of oil well through studding many subjects relating with this topic.

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**Drilling Engineering I-** PE302
4. Lecture Type	**Direct**
5. Semester/Year	**year**
6. No. of credit hours	**120**
7. Instructor Name	**Asst. prof. dr. Faleh H. M. Almahdawi**

8. Course Objectives:

1. **Introduction to drilling engineering**
2. **Drilling operations**
3. **Mud engineering and rheology**
4. Well design and cementing

etc.,

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. **Select the suitable drilling mud**
2. **Calculate the necessary amounts to prepare drilling mud**
3. **Calculate the pressures inside the well and optimum hydraulics calculations**
4. **Design and cementing oil well**

etc.,

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. **Work as drilling engineering in oil fields**
2. **Lead the team on the rig.**
3.
4.

etc.,

Teaching/learning methods (put your methods of teaching)

1. Lectures.
2. Class problem solving.
3. Discussion
4.

etc.,

Assessment methods (write your assessment methods)

1. **homework problem sets,**
2. **exams**
3. **lab reports**
4.

etc.,

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. **best methods to study natural sciences**
2. **Critical Thinking**
3. **Analytical methods in solving problems**
4.

etc.,

Teaching/learning methods

1. Brain storming
2. Encourage Critical thinking
3. Encourage analytical thinking strategy
4. Introduce correct research methodologies

etc.,

Assessment methods

1.Exams
2. Student feedback
3. body language
4. laboratory reports / studies

etc.,

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. Work within teams
2. Write academic reports
3. Analyse and verify scientific facts
4. Plan and organize time of study
5. Initiate new ideas and motivate others
6. conduct targeted searches of scholarly literature.

10. Grading

1.Theoritical part: 30 %
2. lab. part : 20%
3. Final exam : 50%

11. Course Content

Week No.	No. of hours	Reference	Topic
1	**4**	Drilling methods and types of mud	Rotary drilling and its equipment, density calculations and additions
2	**4**	Drilling methods and types of mud	Rotary drilling and its equipment, density calculations and additions
3	**4**	Drilling methods and types of mud	Rotary drilling and its equipment, density calculations and additions
4	**4**	Drilling methods and types of mud	Rotary drilling and its equipment, density calculations and additions
5	**4**	Drilling methods and types of mud	Rotary drilling and its equipment, density calculations and additions
6	**4**	Drilling methods and types of mud	Rotary drilling and its equipment, density calculations and additions
7	**4**	drilling problems and bit types	Types of Bits, loss of drilling fluid, stuck of pipes
8	**4**	drilling problems and bit types	Types of Bits, loss of drilling fluid, stuck of pipes
9	**4**	drilling problems and bit types	Types of Bits, loss of drilling fluid, stuck of pipes
10	**4**	drilling problems and bit types	Types of Bits, loss of drilling fluid, stuck of pipes
11	**4**	drilling problems and bit types	Types of Bits, loss of drilling fluid, stuck of pipes
12	**4**	drilling problems and bit types	Types of Bits, loss of drilling fluid, stuck of pipes
13	**4**	Calculations of hydraulic pressure loss	circulation pressure, pressure drop during the drilling fluid cycle
14	**4**	Calculations of hydraulic pressure loss	circulation pressure, pressure drop during the drilling fluid cycle
15	**4**	Calculations of hydraulic pressure loss	circulation pressure, pressure drop during the drilling fluid cycle
16	**4**	Design of the drill string and its equipment	Design of the drill pipe and drill Collar and its equipment
17	**4**	Design of the drill string and its equipment	Design of the drill pipe and drill Collar and its equipment
18	**4**	Design of the drill string and its equipment	Design of the drill pipe and drill Collar and its equipment
19	**4**	Design of the drill string and	Design of the drill pipe and drill Collar and its equipment

		its equipment	
20	**4**	Casing design and bit selection	selection of bit, types of casing
21	**4**	Casing design and bit selection	Design factors
22	**4**	Casing design and bit selection	selection of bit, types of casing
23	**4**	Casing design and bit selection	selection of bit, types of casing
24	4	Cementing operations and calculations for cementing operations	Types of cement , Methods of cementing and calculation
25	**4**	Cementing operations and calculations for cementing operations	Types of cement , Methods of cementing and calculation
26	**4**	Cementing operations and calculations for cementing operations	Types of cement , Methods of cementing and calculation
27	**4**	Cementing operations and calculations for cementing operations	Types of cement , Methods of cementing and calculation
28	**4**	Hydraulic calculation Pressure loss calculation	Hydraulic of cementing job
29	**4**	Hydraulic calculation Pressure loss calculation	Hydraulic of cementing job
30	**4**	Hydraulic calculation Pressure loss calculation	Hydraulic of cementing job

12. References

1. Textbooks	**1.** Drilling Engineering I by Akram hamoody Alhiti **2.** **3.** **etc.,**

2. References	1-Rig hydraulic 2-Applied drilling Engineering 3- drilling mud technology
3. Recommended readings	1. SPE journal 2. JPT journal
4. Electronic/ Online references (Available upon request)	Drilling Manuals www.spe.org

13. Course improvement plan

1. Using video about the drilling operations
2. Visiting the oil fields
3. Development the lab using new laboratory equipment and methods

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Petroleum Engineering Department

Engineering Mathematics

Syllabus

1. **Differential Equations**
   (definition of ordinary and Partial differential equations , degree , order).
2. **Solutions of Ordinary Differential Equations.**
   (first order, second order , higher order).
3. **Applications of First Order and Second Order Differential Equations.**
4. **Solutions of Differential Equations Using Power Series.**
   (Taylor series, Maclaurin Series)
5. **Solutions of Differential Equations Using Laplace Transforms.**
6. **Special Functions. (gamma function, bessel functions** .
7. **Numerical Methods.**
8. **Partial Differential Equations.**
   (Introduction)

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**GE302 Engineering Mathematics**
4. Lecture Type	**Hard and Soft**
5. Semester/Year	**Annual / 2020-2021**
6. No. of credit hours	**120 hr (4 hr/week)**
7. Instructor Name	**Assistant Lecturer: Mohammed Gassab Shamikh**

8. Course Objectives:

1. Understanding, predicting and optimizing engineering systems that deterministic and are modeled using differential equations.
2. Providing an introduction to differential equations and their solutions and statistics.
3. Bringing the knowledge gained and making the connection between theoretical knowledge taught in textbooks/homework problems.

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes:

Upon completion of the course, students should be able to:

1. The ability to solve mathematical equations.
2. The ability to understand problems and use suitable equation to solve it

B. Skills Outcomes:

Upon completion of the course, students should be able to:

1. Apply statistical analysis of a variety of experimental and observational studies.
2. Derive mathematical models of physical systems.
3. Solve differential equations using appropriate methods.

Teaching/learning methods

1. Lectures.
2. Class problem solving.
3. Video lectures
4. Online discussion

Assessment methods

1. Homework problem.
2. Monthly exam.
3. Quizzes.

C. Affective value outcomes:

Upon completion of the course, students should be able to apply:

1. Selecting and applying general rules correctly to solve problems including those in real-life contexts.
2. Developing mathematical curiosity and use inductive and deductive reasoning when solving problems.
3. Analytical methods in solving problems.

Teaching/learning methods

1. Brain storming.
2. Encourage Critical thinking.
3. Encourage analytical thinking strategy.
4. Introduce correct research methodologies.

Assessment methods

1. Exams.
2. Student feedback.
3. Problem recognition type.
4. Assessing skill in problem solving.

D. Life learning outcomes:

Upon completion of the course, students should be able to:

1. Think critically, research and reason.
2. Apply analytical and theoretical skills to model and solve mathematical problems.
3. Analyse data and draw appropriate statistical conclusions.

10. Grading

1. Quizzes	8 %
2. Discussion	5 %
3. Monthly Exams	12 %
4. Home Works	5 %
5. Final Exam	70 %

11. Course Content

Week No.	No. of hours	Reference	Topic
1 - 2	8	Engineering mathematics H.K. DASS	Definition of ordinary and partial differential equations, order, degree
3-5	8	Engineering mathematics H.K. DASS	Solution of first order differential equations
6	4	Engineering mathematics H.K. DASS	Application of first order differential equations
7-9	12	Engineering mathematics H.K. DASS	Solution of second order differential equations
10	4	Engineering mathematics H.K. DASS	Application of second order differential equations
11-13	16	Engineering mathematics H.K. DASS	Solution of differential equations using power series
14	4	-	Lessons Review + monthly exam
15-19	20	Engineering mathematics H.K. DASS	Solution of differential equations using Laplace transforms
20-22	4	Engineering mathematics H.K. DASS	Special functions
21 - 24	16	Engineering mathematics H.K. DASS	Multiple Integration
25-26	8	Engineering mathematics H.K. DASS	Numerical methods
27-29	16	Engineering mathematics H.K. DASS	Introduction to Partial differential equations
30	4	-	Lessons Review + monthly exam

12. References

1. Textbooks	Advanced Engineering Mathematics Erwing Kreyszig.
2. References	Engineering mathematics H.K. DASS
3. Electronic/ Online references (Available upon request)	1. https://people.math.harvard.edu/~shlomo/docs/Advanced_Calculus.pdf

13. Course improvement plan

1. Increasing the number of textbooks so that every student can have one.
2. Inserting the electronic education as an external activity.

Ministry of Higher Education

AL-Farabi University Collage

Petroleum Engineering Department

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

(Reservoir Engineering I)

Syllabus

Course Description:

Petroleum Reservoir Engineering–1 is a course to teach students the principle ideas and laws of a petroleum reservoir. The course consists of two parts, Theoretical and Practical (Laboratory) lectures.

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**Petroleum Reservoir Engineering-** PE300
4. Lecture Type	**1- Theoretical lectures to be given to explain to students what a petroleum reservoir is, what are the types of reservoirs, what types of flow exist, what types of fluid are there and other theories of flow in the reservoir and drive mechanisms.** **2- Laboratory lectures where students perform special experiments to measure reservoir rock and fluid properties.**
5. Semester/Year	**The course is yearly.**
6. No. of credit hours	**1- Theoretical part of 4 hours/week.** **2- Practical part of 2 hours/week.**
7. Instructor Name	**Dr. Eng. Shamil Ibrahim Muhammed Albassam**

8. Course Objectives: The main objectives are:

1. **Teach the students the principle of a petroleum reservoir.**
2. **What is a reservoir, what are its components and what are their properties.**
3. **What are the types of drive mechanisms that exist in a Petroleum reservoir and what are the properties of each mechanism.**
4. **How to calculate H-C in place.**
5. **What types of fluids and fluid flow regimes are there in a reservoir, and how to calculate each type of fluid in the reservoir.**
6. **Porosity of reservoir rocks; types of porosity and calculation.**
7. **Permeability of reservoir rocks; types and calculation.**
8. **Classification of H-C reservoirs according to P-T diagram.**
9. **Fluid Saturation; principle and calculation.**
10. **Capillary pressure phenomena; principle, calculation and calculation of WOC,FWL Depths and Transition zone thickness.**

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

1. **Students learn what is a petroleum reservoir, what are its properties, reservoir porosity, reservoir permeability, oil, water and gas saturation. Calculation of oil and gas in place, measurement of rock and oil properties. Fluid flow in the reservoir and its calculation.**
2. **Teaching methods are through theoretical lectures given through which discussions are held with the students to try to give them the initiative to solve or explain scientific phenomena in oil and gas flow in the reservoir or other problems and how to solve problems that might happen during such flow systems.**
3. **Assessments are done either by direct discussion in the class or by giving the students certain actual field case studies,**

Teaching/Learning methods

1. **Through theoretical lectures given to them.**
2. **Through direct discussions in the class with their lecturer.**
3. **Explaining some real or actual case studies.**
4. **Sometimes and if necessary, some videos are presented to explain certain cases or questions raised by students.**

Assessment methods

1. **Direct lectures using an overhead projector to show certain formulas, figures and pictures to explain certain subjects or items.**
2. **Laboratory experiments to explain how to measure certain properties of reservoir rocks and how to calculate other properties from these measurements.**
3. **Laboratory experiments to explain how to measure certain properties of reservoir fluids.**
4. **Sometimes and when possible, certain field visits are prepared to take students to the field and see live work in the field and problems faced and how to solve them in all petroleum industry fields. Usually in such visits lectures are given for certain petroleum subjects and how to deal with problems or solve them**

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. **Calculate oil and gas flow in the reservoir.**
2. **Calculate oil and gas properties like Bo, Bg, GOR, Saturation Pressure, Gas and/or Oil Density and Gravity, Gas z-Factor Oil Density Variation with pressure inside the reservoir and other properties,**
3. **Be qualified to continue their 4th, Year Reservoir Engineering-2 class based on the knowledge they got in their 3rd. year Reservoir Engineering-1 class.**

Teaching/learning methods:

1. **Direct Lectures in classroom before COVID-19.**
2. **Online Lectures using Google class room and Google meet system.**
3. **Laboratory experiments to measure reservoir rocks and fluids properties either through direct Lab. Attendance or by Google meet lectures using pdf. or ppt. lectures.**
4. **Sometimes. when necessary, lectures are explained using certain scientific videos.**

Assessment methods:

1. **Home works (problem solving or report writing)**
2. **Quizzes**
3. **Monthly Exams.**
4. **Final Exams**

5. **Class discussions and answering of questions raised by the lecturer orally or on the classroom board.**

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. **Calculate and solve certain subjects related to petroleum reservoirs.**
2. **Discuss and explain most of the phenomena related to petroleum reservoirs.**
3. **Be ready to continue their education in their 4th. Year course in Petroleum Reservoir Engineering-2.**

10. Grading:

1. **Class short quizzes.**
2. **Lab. Report writing.**
3. **Students class activity and participation in answering questions or solving problems.**
4. **Student regularity in lectures attendance.**
5. **Monthly or semester exams.**
6. **Final Exam.**

11. Course Content: No. of hours are 6 hours/week divided into 4 hours theoretical lectures and 2 hours practical Laboratory experiments and measurements.

Week No.	No. of hours	Reference	Topic
1	4 Theoretical 2 Lab.	1. Reservoir Engineering Handbook… Tarek Ahmed. 2. Applied Petroleum Reservoir Engineering.. Craft & Hawkins 3. Fundamentals of Reservoir Engineering L.P. Dake. 4. Petroleum Wikipedia 5. Special professional articles from the internet. 6. Laboratory Catalogues and my own Lab. Experience and Knowledge.	1. What is reservoir engineering and with what it works 2. Introduction on rules of working in the laboratory and main experiments to be taken during the year.
2	4 Theoretical 2 Lab.		1. Types of petroleum reservoirs and how a reservoir is formed. 2. 1st. experiment; How to cut a small specimen (Plug) of a rock for testing.
3	4 Theoretical 2 Lab.		1. Porosity; Theory, Definition, Formula, Types, Calculation. 2. Rock plug grinding and preparation for testing.
4	4 Theoretical 2 Lab.		1. Methods of measuring porosity. 2. Core cleaning with Soxhlete extraction Method.
5	4 Theoretical 2 Lab.		1. Averaging Porosity method. 2. Water content measurement by Dean & Stark method.
6	4 Theoretical 2 Lab.		1. Determination of Oil In Place (OIP) & Gas in Place (GIP); Formulas and Calculation. 2. Pressure Gauges calibration with Dead Weight Tester method.
7	4 Theoretical 2 Lab.		1. Permeability; Theory, Definition, Formula, Calculation, Types. 2. Lab. Measurement of Porosity by Liquid Saturation method
8	4 Theoretical 2 Lab.		1. Permeability Averaging methods and calculations. 2. Lab. Gas Permeability Measurement.
9	4 Theoretical 2 Lab.		1. Fluid Saturation; Definition, Formula, Types of Saturations in the reservoir.

			2. Lab Liquid Permeability Measurement.
10	4 Theoretical 2 Lab.		1. Wettability Phenomena in a reservoir and Capillary Pressure, Calculation of Depth of End of Oil Zone, Transition Zone, WOC, FWL using Capillary Pressure Data of a reservoir. 2. Lab. Capillary Pressure Measuring using Mercury Injection Equipment.
11	4 Theoretical 2 Lab.		1. P-T Diagram and the H-C reservoir Classification. 2. Reservoir PVT Analysis and the calculation of Reservoir fluid properties.
12	4 Theoretical 2 Lab.		1. Reservoir Gas properties (Ideal and Real Gas); Density, Gravity, Apparent Molecular Weight, z-Factor, Bg. 2. Determination of Saturation Pressure of Reservoir Crude Oil
13	4 Theoretical 2 Lab.		1. PVT Analysis of Reservoir Crude Oil; Saturation Pressure, Bo, Density, GOR and their Calculations. 2. Calculation of Reservoir oil GOR and Drawing its graph using PVT Data.
14	4 Theoretical 2 Lab.		1. Flow regimes in Oil reservoirs and their Calculation. 2. Calculation of Reservoir oil Bo and Drawing its graph using PVT Data.
15	4 Theoretical 2 Lab.		1. Flow regimes in Oil reservoirs and their Calculation. 2. Review of all experiments and answering student questions before final examination.

12. References:

1. Textbooks	1. Reservoir Engineering Handbook… Tarek Ahmed. 2. Applied Petroleum Reservoir Engineering.. Craft &

	Hawkins. **3. Fundamentals of Reservoir Engineering L.P. Dake.** **4. Petroleum Wikipedia subjects (Internet).** **5. Special professional articles from the internet (Google Search)to enrich the lectures.** **6. Laboratory Catalogues and my own Lab. Experience and Knowledge.**
2. References	**1. Reservoir Engineering Handbook… Tarek Ahmed.** **2. Applied Petroleum Reservoir Engineering.. Craft & Hawkins.** **3. Fundamentals of Reservoir Engineering L.P. Dake.** **4. Petroleum Wikipedia subjects (Internet).** **5. Special professional articles from the internet (Google Search)to enrich the lectures.** **6. Laboratory Catalogues and my own Lab. experience and Knowledge.**
3. Electronic/ Online references (Available upon request)	**1. Own PDF lectures used in Online Lectures using Google Class room and Google Meet Technique.** **2. Some internet videos for explain some lab. Experiments presented through Google Meet Technique.**

13. Course improvement plan

1. **Adding some new articles to explain more ideas in reservoir engineering.**
2. **Adding more Diagrams, Pictures and Graphs to extend the understanding standard of some reservoir phenomena.**
3. **If time will be available, I'll try to present some class seminars on certain subjects and have direct analysis done by the students to give them the courage to discuss such things in public and see the standard of their understanding of reservoir engineering principles.**

Ministry of Higher Education

AL-Farabi University Collage

Petroleum Engineering Department

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

Technical English
Syllabus

General study of English language through the use of subjects related to the specialization of the department such as: petroleum industry, petroleum exploration, drilling for oil, recovering oil, oil transportation, oil refinery, careers in the petroleum industry.

1. Institution Name	Al-Farabi University College
2. Department Name	Petroleum Engineering Department
3. Course Code & Name	GE310 Technical English- GE303
4. Lecture Type	Hard and Soft
5. Semester/Year	Annual / 2020-2021
6. No. of credit hours	60 hr (2 hr/week)
7. Instructor Name	Assistant Lecturer Tiba Nayyef Jasim

8. Course Objectives:

1. Talk about business subjects.
2. understand charts and graphs
3. Write short business emails, reports and make notes on simple topics.
4. Follow short telephone conversations.
5. Follow simple presentations/demonstrations.
6. Exchange straightforward opinions and make requests.
7. Offer advice and state routine requirements

etc.,

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. Acquire the use of grammar effectively (vocabulary and so on) through extensive coursework on writing reports and reading comprehensions, articles, essays, general discussion etc.
2. To bring an awareness among the future entrepreneurs about the risks in the running enterprises.
3. To inculcate profound knowledge through BEC for practical, everyday use in business.

etc.,

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. Assess the skills of writing business letters in various situations and generate skills of writing business letters, essays and memos.
2. Categorize the various structures of reports and compose to use them in the professional scenario.

etc.,

Teaching/learning methods

1. Lectures.
2. Class problem solving.
3. Video lectures
4. Online discussion

etc.,

Assessment methods

1. Homework problem.
2. Monthly exam.
3. Quizzes.

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. Best methods to study language.
2. Critical Thinking

etc.,

Teaching/learning methods

1. Brain storming.
2. Encourage conversation skills.
3. Introduce correct research methodologies.

etc.,

Assessment methods

1. Exams.
2. Student feedback.
3. Oral examination.

etc.,

D. Life learning outcomes: Upon completion of the course, students should be able to:

1) Work within teams
2) Write academic reports
3) Write formal and informal letters
4) Initiate new ideas and motivate others
5) Conduct targeted searches of scholarly literature.

etc.,

10. Grading

1. Quizzes (2 X 4)	8 %
2. Discussion (1 X 5)	5 %
3. Monthly Exams (2 X 6)	12 %
4. Home Works (1 X 5)	5 %
5. Final Exam	70 %

11. Course Content

Week No.	No. of hours	Reference	Topic
1 - 4	**8**	English for Petroleum, Ken McIntyre	**Introduction to Grammar, Parts of Speech, and Technical Vocabulary**
5	**2**	**-**	**Lessons Review + Quiz**
6 - 9	**8**	Interchange, Jack C. Ritchards, fourth editionetc., 2005.	**Sentence and Sentence Construction, Homophones, Homographs, and Homonyms**
10	**2**	**-**	**Lessons Review + Monthly Exam**
11 - 14	**8**	Business results – Intermediate – John Hughes, John Newton	**Verb – Tense, Word Formation – prefix and suffix, Answering multiple choice questions on short conversations or monologues.**
15	**2**	**-**	**Lessons Review + Quiz**
16 - 19	**8**	English for Petroleum, Ken McIntyre	**Voice and Reported speech, Synonyms and Antonyms, Listening for completing notes based on conversation on a monologue, Expressing opinions, Agreeing and Disagreeing, Talking about oneself, ones current situations and plans.**
20	**2**	**-**	**Lessons Review + Quiz**
21 - 24	**8**	English for Petroleum, Ken McIntyre	**Giving ones opinion on business situations, talking about some prompts for an extended period of time & Discussion with a business situation with a partner. Reading for detailed comprehension of detailed material; Skimming and Scanning. Writing to deal with requests, giving information about a product.**
25	**2**	**-**	**Lessons Review + Monthly Exam**
26 -29	**8**	Business results – Intermediate – John Hughes, John Newton	**Reading for inference and Global meaning, Understanding Vocabulary and grammar in a short text, Writing for functional/ communicative task- e.g. Re-arranging appointments, asking for permission, giving instructions.**

30	**2**	**-**	**Lessons Review + Quiz**

12. References

1. Textbooks	1. Business results – Intermediate – John Hughes, John Newton 2. English for Petroleum, Ken McIntyre **etc.**
2. References	Interchange, Jack C. Ritchards, fourth editionetc., 2005. **etc.,**
3. Electronic/ Online references (Available upon request)	**https://www.cambridgeenglish.org/** **etc.,**

13. Course improvement plan

1. Organizing promotional seminars to develop communication skills
2. Inserting the electronic education as a basic activity.
3. Providing modern textbooks.

etc.,

Ministry of Higher Education

AL-Farabi University Collage

Petroleum Engineering Department

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

(Well Logging)

Syllabus

Course Description:

The oil and gas industry records rock and fluid properties to find hydrocarbon zones in the geological formations intersected by a borehole. The logging procedure consists of lowering a "logging tool" on the end of a wireline into an oil well to measure the rock and fluid properties of the formation. An interpretation of these measurements is then made to locate and quantify potential depth zones containing oil and gas. Logging tools developed over the year's measure the electrical , acoustic ,radioactive, Electromagnetic, nuclear magnetic resonance, and other properties of the rocks and their contained fluids. Logging is usually performed as the logging tools are pulled out of the hole. This data is recorded to a printed record called a "well log" and is normally transmitted digitally to office locations. Well logging is performed at various intervals during the drilling of the well and when the total depth is drilled, which could range in depths from 300 m to 8000 m (1000 ft to 25,000 ft) or more.

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering**
3. Course Code & Name	**Well logging -PE306**
4. Lecture Type	**PowerPoint + Tutorial video & Discussion**

5. Semester/Year	**Year**
6. No. of credit hours	**6 Hours**
7. Instructor Name	**Amjed Abdulqadir**

8. Course Objectives:

Quantitative analysis of well logs provides the analyst with values for a variety of primary parameters such as :

1. **Porosity**
2. **Water saturation, fluid type (oil/gas/water)**
3. **Lithology**

4.Permeability ……..etc

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. At the end of this course, the students should be able to understand the basics of borehole geophysics, theory of measurements, interpretations and applications of the different types of wireline logs.

B. Skills Outcomes: Upon completion of the course, students should be able to:

Students should know how to calculate the petrophysical parameters required for formation evaluation (source and reservoir rocks) through comprehensive study of modern well logging methods, open hole & cased hole log interpretation methods, production logging.

Teaching/learning methods

1. **1. Power Point lectures**
2. **Class problem solving.**

3.Discussion

Assessment methods

1. **Exams**
2. **Lab reports**
3. **Scientific videos**
4. **Homework problems sets**

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. Best methods to study natural sciences
2. Critical thinking
3. Analytical methods in solving problems

Teaching/learning methods

1. Brain storming
2. Encourage critical thinking
3. Encourage analytical thinking strategy
4. Introduce correct research methodologies

Assessment methods

1. Exams
2. student feedback
3. Laboratory reports/studies

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. Work within teams
2. Analyse and verify scientific facts
3. Plan and organize time of study
4. Initiate new ideas and motivate others

10. Grading

1. Annual quest degree 30%
2. Final exam. Degree 70%

11. Course Content

Week No.	No. of hours	Reference	Topic
1	4	3	Exploration with wire logs
2	4	3	Measurements while drilling basics
3	4	2	SP & GR Logs
4	4	1	Resistivity logs-1
5	4	1	Resistivity logs-2
6	4	2	Porosity logs :Sonic logs
7	4	2	Porosity logs: Density &Neutron logs
8	4	2	Hingle & Pickets plots
9	4	4	Logs selections-1
10	4	4	Logs selections-2
11	4	4	Cross-plot interpretation
12	4	4	Mid-point & M-N interpretation
13	4	1	Shaly Sand Analysis
14	4	1	Shaly carbonate Analysis
15	4	1	Quality Control

12. References

1. Textbooks	1.Open-hole log analysis and formation evaluation by Richard M. Bateman,2003
2. References	Basic well logging analysis for geologists. By George Asquith.1985
4. Electronic/ Online references (Available upon request)	1-Well logging and formation evaluation by Toby Darling,2005 2-Logs interpretation charts.Edition 2009 by Schlumberger

13. Course improvement plan

At the end of this course, the students should be able to understand the basics of borehole geophysics, theory of measurements, interpretations and applications of the different types of wireline logs including all the new development tools which enter in the actual services.

Ministry of Higher Education

AL-Farabi University Collage

Petroleum Engineering Department

(Geophysics – 3rd year)

Syllabus

Course Description: **Brief discussion of the three geophysical methods: gravity, magnetic and seismic as applied in oil exploration**

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Pet. Engineering**
3. Course Code & Name	**Geophysics**
4. Lecture Type	**Direct to students**
5. Semester/Year	**semester**
6. No. of credit hours	**3**
7. Instructor Name	**Dr. Zuhair AL Shaikh**

8. Course Objectives:

1. Enable student to understand and analyses results from the exploration methods
2.
3.
4.

etc.,

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

1. Assessment of results of geophysical exploration
2.
3.

etc.,

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. They become able to read and try interpreting geophysical maps.
2.
3.

etc.,

Teaching/learning methods

1. Lectures and report writing on the subject
2.
3.
4.

etc.,

Assessment methods

1. Weekly and monthly tests.
2. Oral discussion.
3.
4.
5.

etc.,

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. They become able to read and try interpreting geophysical maps.
2.
3.

etc.,

Teaching/learning methods

1. As above
2.
3.
4.

etc.,

Assessment methods

1. As above
2.
3.
4.

etc.,

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. They should be able to use the references they may need.
2.
3.
4.

etc.,

10. Grading according to results in a number of tests

1. Yearly work 30%
2. Final exam 70%

etc.,

11. Course Content

Week No.	No. of hours	Reference	Topic
1	3		Gravity
2	3		Gravity
3	3		Gravity
4	3		Gravity
5	3		Gravity
6	3		Seismic
7	3		Seismic
8	3		Seismic
9	3		Seismic
10	3		Seismic
11	3		Seismic
12	3		Seismic
13	3		Magnetic
14	3		Magnetic
15	3		Magnetic

12. References

1. Textbooks	1. Introduction to applied geophysics by M. Dobrin 2. Handout notes 3. Applied problems etc.,
2. References	1. Geophysical approach 2. 3. etc.,
4. Electronic/ Online references (Available upon request)	1. Google meet 2. Google classroom 3. etc.,

13. Course improvement plan

1. Adding one practical unit
2.
3.
4.
etc.,

كلية الفارابي الجامعة

قسم هندسة النفط

Course Description Form

1. Course Name:
Petroleum production engineering I
2. Course Code:
PE 304
3. Semester / Year:
Year
4. Description Preparation Date:
5 – 12 – 2024
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
90/4
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Lect. Jaafar K. A. Al-Ogaili Email: jaafer.kazim@alfarabiuc.edu.iq
8. Course Objectives

Course Objectives	• **Well Completion Operations: (Parameter of Design, Completion Methods, Equipment, Completion Fluids).** • **Perforation of Oil and Gas Wells: (Perforation Methods, Selection of Perforation Intervals)**

	• **Water and gas coning, (methods for determining oil production rate without coning).** • **Completion efficiency.** • **Drill Stem Test (DST):(Test Method, Equipment, Pressure versus Time Curve, Theory of Pressure Buildup, Reservoir Properties Obtained, Depletion).** • **Helical Bucking of Tubing (Forces, Homogeneous Completion, Packers Permitting Free and Limited Motions, Compound Completion of Wells).** • **Surface Gathering Systems (Types of Gathering Systems, Behavior of Fluid Flow, Flow Lines, Essential Flowing Lines, Valves).** • **Separation of Oil, Gas, and Water: (Types of Separators, components of separators and functions).** • **Oil storage (storage tanks and accessories, calibration, measurement of liquid level).** • **Production by Pumps: (Sucker Pump, Electrical Submersible Pumps).**

9. Teaching and Learning Strategies

Strategy	1. Brain storming. 2. Encourage Critical thinking. 3. Encourage analytical thinking strategy. 4. Introduce correct research methodologies.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

11. Course Evaluation

1. Quizzes.
2. Classwork.
3. Homework.
4. Monthly exams.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Petroleum production engineering handbook.
Main references (sources)	Petroleum production engineering handbook.
Recommended books and references (scientific journals, reports…)	Petroleum production engineering by R.E. Collins.
Electronic References, Websites	https://petrowiki.spe.org

Ministry of Higher Education

AL-Farabi University Collage

Petroleum Engineering Department

Numerical Method and Reservoir Simulation

Syllabus

1. **Interpolation.**
   (Linear, Lagrange).
2. **Matrices.**
   (review of matrix properties, determinants, inverse of matrix).
3. **Solution of System of Linear Equations.**
   (Gaussian Elimination, Gauss Jordan Method).
4. **Iterative Methods.**
   (Jacobi and , Gauss Seidel methods).
5. **Least Squares Method.**
   (Linear, Polynomial)
6. **Reservoir Simulation.**
   (Introduction)
7. **Principles of Fluid Flow through Porous Medium.**
8. **Flow Equation.**
9. **Finite Difference methods.**
   (Taylor Series, Forward Difference, Backward Difference, Central Difference Central Difference, concepts of explicit and implicit methods)
10. **Solution of System of Difference Equations.**
    (tridiagonal algorithm)
11. **Irregular gridding.**
12. **Transmissibility, the Finite Difference form of flow equation in terms of transmissibility.**
13. **Averaging**

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**PE408 Numerical Method and Reservoir Simulation**
4. Lecture Type	**Hard and Soft**
5. Semester/Year	**Annual / 2020-2021**
6. No. of credit hours	**120 hr (4 hr/week)**
7. Instructor Name	**Assistant Lecturer : Mohammed Gassab Shamikh**

8. Course Objectives:

1. Learning how to derive the partial differential equations that governing the flow in porous media.
2. Learning how to solve numerically the partial differential equations that governing the flow in porous media.
3. Providing an introduction to differential equations and their solutions and statistics.
4. Bringing the knowledge gained and making the connection between theoretical knowledge taught in textbooks/homework problems.

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes:

Upon completion of the course, students should be able to:

- Applying reservoir simulation techniques to predict future behaviour of petroleum reservoirs.

B. Skills Outcomes:

Upon completion of the course, students should be able to:

- The students will gain insight into the workings of today's reservoir simulation software, their formulation and solution methods.
- The students will be able to communicate this know how to others and pursue further his/her own development within the subject.

Teaching/learning methods

1. Lectures.
2. Class problem solving.
3. Video lectures
4. Online discussion

Assessment methods

1. Homework problem.
2. Monthly exam.
3. Quizzes.

C. Affective value outcomes:

Upon completion of the course, students should be able to apply:

1. Selecting and applying general rules correctly to solve problems including those in real-life contexts.

2. Developing mathematical curiosity and use inductive and deductive reasoning when solving problems.
3. Analytical methods in solving problems.

Teaching/learning methods

1. Brain storming.
2. Encourage Critical thinking.
3. Encourage analytical thinking strategy.
4. Introduce correct research methodologies.

Assessment methods

1. Exams.
2. Student feedback.
3. Problem recognition type.
4. Assessing skill in problem solving.

Life learning outcomes:

Upon completion of the course, students should be able to:

1. Think critically, research and reason.
2. Apply analytical and theoretical skills to model and solve mathematical problems.
3. Describe the various difference methods which are used to solve the transport equations applied in reservoir simulation software.
4. Describe the different linear equation solvers solution methods used in reservoir simulators.
5. Argue for the consequence for stability and dispersion when applying reservoir simulation software.

10. Grading

1. Quizzes	5 %
2. Monthly Exams	20 %
3. Home Works	5 %
4. Lab.	20%
5. Final Exam	50 %

11. Course Content

Week No.	No. of hours	Reference	Topic
1 - 3	12	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Interpolation (Linear, Lagrange).
4-5	8	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Matrices.
6-7	8	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Solution of System of Linear Equations.
8	4	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Iterative Methods.
9-10	8	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Least Squares Method.
11-12	8	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Reservoir Simulation.
13-14	8	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Principles of Fluid Flow through Porous Medium
15	4	-	Lessons Reviews + Monthly Exam
16-17	8	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Flow Equation.
18-19	8	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Finite Difference methods.
20	4	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Solution of System of Difference Equations.
21	4	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Irregular gridding.
22-24	12	Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.	Transmissibility, the Finite Difference form of flow equation in terms of transmissibility.

25-27	**12**	**Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.**	**Averaging**
28-29	**8**	**-**	**Lessons Reviews**
30	**4**	**-**	**Monthly Exam**

12. References

1. Textbooks	**- Petroleum Reservoir Simulation A Basic Approach by Abou-Kassem J. H., Farouq Ali S. M. and Islam M. R.**
2. References	**- Basic Applied Reservoir Simulation by Ertekin T., Abou-Kassem J.H. and King G. R.**
3. Electronic/ Online references (Available upon request)	**https://www.ntnu.edu/studies/courses/TPG4160#tab=omEmnet**

13. Course improvement plan

1. Increasing the number of textbooks so that every student can have one.
2. Inserting the electronic education as an external activity.

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كلية الفارابي الجامعة

قسم هندسة النفط

(Secondary Oil Recovery)

Syllabus

Course Description: (This course explains the secondary and tertiary oil production methods. Choose the most appropriate methods. Determining the amount of oil recovery through each method)

1. Institution Name	Al-Farabi University College
2. Department Name	Petroleum Engineering Department
3. Course Code & Name	PE406 Secondary Oil Recovery
4. Lecture Type	Theoretical
5. Semester/Year	year
6. No. of credit hours	3
7. Instructor Name	Ghassan Husham jani

8. Course Objectives:

1. Learn about secondary and tertiary methods
2. Choosing the best possible method
3. Recognize the efficiency of each method
4.

etc.,

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. Distinguish between secondary and tertiary methods of oil production
2. Know the determinants of each method
3. Ability to distinguish the amount of extraction possible by using each method

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. Distinguish between secondary and tertiary methods of oil production
2. Know the determinants of each method
3. Ability to distinguish the amount of extraction possible by using each method

Teaching/learning methods (put your methods of teaching)

1. Lectures.
2. Class problem solving.
3. Discussion

Assessment methods(write your assessment methods)

1. homework problem sets,
2. exams
3. reports

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. best methods to study natural sciences
2. Critical Thinking
3. Analytical methods in solving problems
4. The ability to discuss and accept opinions to choose the best methods
5. The ability to cooperate and participate in the decision

Teaching/learning methods

1. Lectures.
2. Class problem solving.
3. Discussion

Assessment methods

1. Discussion
2. oral exam
3. the exam
4. periodic reports

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. Distinguish between secondary and tertiary methods of oil production
2. Know the determinants of each method
3. Ability to distinguish the amount of extraction possible by using each method

10. Grading

1.
2.
3.
4.
etc.,

11. Course Content

Week No.	No. of hours	Reference	Topic
1	3	Enhanced oil recovery	Principles and definitions choice of proper methods for enhanced oil recovery
2	3	Enhanced oil recovery	Recovery by water displacement, Buckley-Leverett method, Welge method, Stiles method
3	3	Enhanced oil recovery	Original and improved Dyktsra-Parsons method, Pattern of flooding
4	3	Enhanced oil recovery	Sweep efficiency
5	3	Enhanced oil recovery	Properties of injected water, Injected pressures
6	3	Enhanced oil recovery	Recovery by immiscible gas
7	3	Enhanced oil recovery	Tarner method, Muskat method, Recovery by miscible gas
8	3	Applied Petroleum Reservoir Engineering by Ronald	Dry gas injection, Enriched gas injection
9	3	Applied Petroleum Reservoir Engineering by Ronald	CO2 injection, N2 injection
10	3	Applied Petroleum Reservoir Engineering by Ronald	Thermal recovery, heat flow through rocks
11	3	Applied Petroleum Reservoir Engineering by Ronald	Steam injection
12	3	Applied Petroleum Reservoir Engineering by Ronald	In-situ combustion
13	3	Applied Petroleum Reservoir Engineering by	Tertiary oil recovery

		Ronald	
14	3	Applied Petroleum Reservoir Engineering by Ronald	Surfactant flooding, Solvent injection
15	3	Applied Petroleum Reservoir Engineering by Ronald	Polymer injection.

12. References

1. Textbooks	1. Enhanced oil recovery [Green,_Don_W.;_Willhite,_G._Paul] 2. 3. etc.,
2. References	1. Applied Petroleum Reservoir Engineering by Ronald E. Terry, J. Brandon Rogers 2. The reservoir engineering aspects of waterflooding 3. Enhanced oil recovery [Marcel_Latil] etc.,
3. Recommended readings	Applied Petroleum Reservoir Engineering by Ronald E. Terry, J. Brandon Rogers
4. Electronic/ Online references (Available upon request)	1. 2. 3. etc.,

13. Course improvement plan

1. Adding an oil injection laboratory to practically test the roads

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قسم هندسة النفط

(4th year ENGLISH LANGUAGE)

Syllabus

Course Description: studding language, vocabulary, reading, speaking and writing of some advanced English literature.

1. Institution Name	Al-Farabi University College
2. Department Name	Petroleum Engineering Department
3. Course Code & Name	English language
4. Lecture Type	theoretical
5. Semester/Year	Year
6. No. of credit hours	One
7. Instructor Name	Dr. Zuhair D. AL shaikh

8. Course Objectives:

1. To study advance scientific work
2.
3.
4.

etc.,

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. To enable students to read and understand scientific papers .
2.
3.

etc.,

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. To write summary of the papers they read
2.
3.
4.

etc.,

Teaching/learning methods All methods

1. Lectures.
2. Class problem solving.

3. Discussion

4.

etc., د

Assessment. (All methods)

1. homework problem sets,
2. exams
3. lab reports
4.

etc.,

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. **best methods to study natural sciences**

Teaching/learning methods (as above)

1.
2.
3.
4.

etc.,

Assessment methods (as above)

1.
2.
3.
4.

etc.,

D. Life learning outcomes: Upon completion of the course, students should be able to: (

1. **As above**
2.
3.
4.

etc.,

10. Grading

1. 30 % yearly
2. 70% final exam
3.
4.
etc.,

11. Course Content

Week No.	No. of hours	Reference	Topic
1	15	1	
2			
3			
4			From unit one to unit four
5			
6			
7			
8			
9			
10			From unit five to unit ten
11			
12			
13			
14			
15			

12. References

1. Textbooks	1. Headway plus (upper intermediate) by John and Liz Soars 2. 3. etc.,
2. References	1. 2. 3. etc.,
3. Recommended readings	
4. Electronic/ Online references (Available upon request)	1. 2. 3. etc.,

13. Course improvement plan

1. Adding an extra units.
2.
3.
4.
etc.,

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قسم هندسة النفط

(Gas technology)

Syllabus

Course Description

Gas technology course provide the students information about the types of the natural gases , type of the gas reservoirs , gas pipe lines , flow performance of gas reservoirs and the methods of removing liquid from gas wells , in addition , methods of calculating the wellhead pressure and bottom hole pressure

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**PE401-gas technology**
4. Lecture Type	**Theoretical lectures**
5. Semester/Year	**Semester**
6. No. of credit hours	**3 hrs**
7. Instructor Name	**Layla Sideeq Mohammed**

8. Course Objectives:

1. To make students familiar with problem of unconventional reservoirs
2. To give students information about the method of increasing gasrecovery

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. Students will be able to solve the urgent problems in the fields
2. Student have an ability to work as a team
3.

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. Thinking quickly and effectively
2. Giving a practical decisions in the field
3.

Teaching/learning methods (put your methods of teaching)

1. Lectures.
2. Class problem solving.
3. Discussion
4.

etc.,

Assessment methods (write your assessment methods)

1. homework problem sets,
2. exams
3. lab reports
4.

etc.,

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. best methods to study natural sciences
2. Critical Thinking
3. Analytical methods in solving problems
4.

etc.,

Teaching/learning methods

1. data show
2. videos
3.

Assessment methods

1. oral exams
2.discussion in the class
3.daily exams

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. best methods to study natural sciences
2. Critical Thinking
3. Analytical methods in solving problems

10. Grading

1. 1. 30% daily exams, attendance and monthly exams
2. 70% final exams

11. Course Content

Week No.	No. of hours	Reference	Topic
1	3	Natural gas engineering, Xiuli Wang and Michael	Properties of Gases
2	3	Natural gas engineering, Xiuli Wang and Michael	Properties of Gases
3	3	Natural gas engineering, Xiuli Wang and Michael	Gas System Analysis
4	3	Natural gas engineering, Xiuli Wang and Michael	Gas System Analysis
5	3	Natural gas engineering, Xiuli Wang and Michael	gasflow through in P.M
6	3	Natural gas engineering, Xiuli Wang and Michael	gasflow through in P.M
7	3	Natural gas engineering, Xiuli Wang and Michael	gasflow through in P.M
8	3	Natural gas engineering, Xiuli Wang and Michael	gasflow through in P.M
9	3	Natural gas engineering, Xiuli Wang and Michael	gas transportation
10	3	Natural gas engineering, Xiuli Wang and Michael	gas transportation
11	3	Gas production operation , H. Dale	Gas Treatment and liquefaction
12	3	Gas production operation , H. Dale	Gas Treatment and liquefaction
13	3	Gas production operation , H. Dale	Gas Treatment and liquefaction
14	3	Gas production operation , H. Dale	Gas Sweetening and Dehydration
15	3	Gas production operation , H. Dale	Gas Sweetening and Dehydration

12. References

1. Textbooks	**1.** **2.** **3.** **etc.,**
2. References	**Gas production operation , H. Dale**
3. Recommended readings	
4. Electronic/ Online references (Available upon request)	**1.** **2.** **3.** **etc.,**

13. Course improvement plan

Gas technology is developed by arranging experimental work lectures through laboratory to study the gas inflow performance by core experiments.

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(production engineering)

Syllabus

Course Description: petroleum production engineering provide the students with the basics of drive mechanisms , reservoir types, IPR , fluid flow through pipes, well testing , wells productivity stimulation and artificial lift methods

1. Institution Name	**Al-Farabi University College**
2. Department Name	**Petroleum Engineering Department**
3. Course Code & Name	**PE404** - petroleum production engineering
4. Lecture Type	**Theoretical lectures**
5. Semester/Year	**yearly**
6. No. of credit hours	**5 hrs- 6 units**
7. Instructor Name	**Layla Sideeq Mohammed**

8. Course Objectives:

1. To make student familiar with the production operation
2. To give an opportunity for students to learn the advanced stimulation methods
3. Learning the students the most modern methods of artificial methods

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

A. Knowledge Outcomes: Upon completion of the course, students should be able to:

1. Work as a team effectively
2. Solving practical problems
3.

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. Dealing with urgent problems in the field
2. Giving suitable quick and decision in the field

Teaching/learning methods (put your methods of teaching)

1. Lectures.
2. Class problem solving.
3. Discussion
4.

etc.,

Assessment methods (write your assessment methods)

1. homework problem sets,
2. exams
3. lab reports
4.

etc.,

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. best methods to study natural sciences
2. Critical Thinking
3. Analytical methods in solving problems
4.

etc.,

Teaching/learning methods

1. Lectures.
2. Class problem solving.
3. Discussion

Assessment methods

1.discussion
2.exams
3. oral exams
4.repots

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. best methods to study natural sciences
2. Critical Thinking
3. Analytical methods in solving problems
4. work as a team

10. Grading

1. 30% daily exams, attendance and monthly exams
2. 70% final exams

11. Course Content

Week No.	No. of hours	Reference	Topic
1.	5	The technology of artificial lift , Kermit E Brown	Types of drive mechanism
2.		The technology of artificial lift , Kermit E Brown	Darcy equation
3.	5	The technology of artificial lift , Kermit E Brown	Vogel method
4.	5	The technology of artificial lift , Kermit E Brown	Standing method
5.	5	The technology of artificial lift , Kermit E Brown	Standing method
6.	5	The technology of artificial lift , Kermit E Brown	Couto method
7.	5	The technology of artificial lift , Kermit E Brown	Future IPR
8.	5	The technology of artificial lift , Kermit E Brown	Future IPR
9.	5	The technology of artificial lift , Kermit E Brown	Fluid flow through tubing
10.	5	The technology of artificial lift , Kermit E Brown	Fluid flow through tubing
11.	5	The technology of artificial lift , Kermit E Brown	Fluid flow through tubing
12.	5	The technology of artificial lift , Kermit E Brown	Fluid flow through tubing
13.	5	The technology of artificial lift , Kermit E Brown	Fluid flow through tubing
14.	5	The technology of artificial lift , Kermit E Brown	Well test
15.	5	The technology	Well test

		of artificial lift , Kermit E Brown	

12. References

1. Textbooks	**1.** **2.** **3.** **etc.,**
2. References	**1- The technology of artificial lift , Kermit E Brown**
3. Recommended readings	
4. Electronic/ Online references (Available upon request)	**1.** **2.** **3.** **etc.,**

13. Course improvement plan

1. the main development the contribute to advance the subject is to arrange an academic trips to the oilfields to be familiar with the latest advanced production technologies.

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Petroleum Drilling Engineering II

Syllabus

Course Description:

Initially, in this course, students will be introduced to the directional drilling history, applications, calculations, and planning directional wells, students will analyse the factors that affect the Rate of Penetration. discussed hole problems in general and concentrate on the stuck pipe and loss circulation during drilling oil and gas wells.in addition, continue to calculate hydraulic calculations. Finally, study well control basic steps and methods.

1. Institution Name	Al-Farabi University College
2. Department Name	Petroleum Engineering
3. Course Code & Name	**Petroleum Drilling Engineering II- PE402**
4. Lecture Type	5-hr lecture/wk
5. Semester/Year	Two semesters 2021-2022
6. No. of credit hours	
7. Instructor Name	Dr. ABDULLAH JALAL MOHAMMED

8. Course Objectives:

1. To develop advanced drilling engineer practice-level.
2. To have students become familiar with types of oil and gas wells.
3. Develop time management skills and teamwork spirit in students

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

1. Demonstrate the ability to analyze and solve advanced drilling engineer problems.
2. Demonstrate the ability to communicate analysis in a professional manner.
3. Exhibit the ability to work in teams/groups effectively

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. Analyze the nature of the problem during drilling the oil wells.
2. Planning directional oil wells.
3. well control during when Kick occurs.
4. knowing the factors that affect the Rate of Penetration.
5. Present problem solutions in a professional manner.

Teaching/learning methods

1. Lectures.
2. Class problem solving.
3. Discussion

Assessment methods

1. Assignment problem sets,
2. Exams
3. Quizzes

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. Best methods to study drilling Eng.
2. Critical Thinking
3. Analytical methods in solving problems

Teaching/learning methods

1. Brainstorming
2. Encourage Critical thinking
3. Encourage analytical thinking strategy
4. Introduce correct research methodologies

Assessment methods
1.Exams 2. Student feedback 3. body language 4. Discussions and presentations
D. Life learning outcomes: Upon completion of the course, students should be able to: 1. Work within teams 2. Write academic reports 3. Analyse and verify scientific facts 4. Plan and organize time of study 5. Initiate new ideas and motivate others 6. conduct targeted searches of scholarly literature.

10. Grading	
Quizzes (3 X 3)	10%
E-learning participation	5%
Midterm Exam	15%
Final Exam	70%

11. Course Content

Week No.	No. of hours	Reference	Topic
1	5	TB1: Ch1 TB2: Ch1	Lecture 1: Directional drilling
2	5	TB1: Ch1 TB2: Ch1	Lecture 2: Directional drilling
3	5	TB1: Ch1 TB2: Ch1	Lecture 3: Directional drilling Quiz1
4	5	TB1: Ch1 TB2: Ch1	Lecture 4: Directional drilling
5	5	TB1: Ch1 TB2: Ch1	Lecture 5: Directional drilling
6	5	TB1: Ch1 TB2: Ch1	Lecture 6: Directional drilling
7	5	TB1: Ch1 TB2: Ch1	Lecture 7: Directional drilling
8	2		EXAM
9	5	TB1: Ch2 TB2: Ch2	Lecture 8: Hole problem
10	5	TB2: Ch2	Lecture9: Hole problem
11	5	TB1: Ch2 TB2: Ch2	Lecture10: Hole problem
12	5	TB1: Ch2	Lecture11: Hole problem
13	5	TB1: Ch2	Lecture12: Hole problem
14	5	TB1:Ch2	Lecture13: Hole problem
15	2		MID EXAM
16	5	TB2: Ch3	Lecture 14: ROP
17	5	TB2: Ch3	Lecture 15: ROP
18	5	TB2: Ch3	Lecture 16: ROP
19	5	TB2: Ch3	Lecture 17: ROP
20	5	TB2: Ch3	Lecture 18: ROP+QUIZ
21	5	TB2: Ch4	Lecture 19: well control
22	5	TB2: Ch4	Lecture 20: well control
23	5	TB2: Ch4	Lecture 21: well control+ quiz
24	5	TB2: Ch4	Lecture 22: well control
25	5	TB2: Ch4	Lecture 23: well control
26	5	TB1: Ch4	Lecture 24: well control+ quiz
27	5	TB2: Ch5	Lecture 19: hydraulic
28	5	TB1: Ch5	Lecture 19: hydraulic
29	5	TB2: Ch5	Lecture 19: hydraulic

30	3	FAINAL EXAM	

12. References

13. Course improvement plan

1 .The course syllabus doesn't include the has the latest practice of drilling engineers.
2. This course is based on literature information problems without any use of computer software.

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قسم هندسة النفط

(reservoir engineering II)

Syllabus

Course Description: (Write a Brief Description of the course)

- Studying the important topics in reservoir engineering.
- Understanding the classification of hydrocarbon reservoirs using the P-T diagram.
- Derive the material balance equation and practice the related calculations.
- Studying the different types of hydrocarbon reservoirs and their related calculations.
- The water drive reservoirs types and calculations.

1. Institution Name	Al-Farabi University College
2. Department Name	Petroleum Engineering Department
3. Course Code & Name	Reservoir engineering II- PE400
4. Lecture Type	Theoretical
5. Semester/Year	year

6. No. of credit hours	**five**
7. Instructor Name	Ahmed Jubair Mahmood

8. Course Objectives:

1. Studying the important topics in reservoir engineering.
2. Understanding the classification of hydrocarbon reservoirs using the P-T diagram.
3. Derive the material balance equation and practice the related calculations.
4. Studying the different types of hydrocarbon reservoirs and their related calculations.
5. The water drive reservoirs types and calculations.

9. Student Learning Outcomes, Teaching/Learning Methods, and Assessment

Knowledge Outcomes: Upon completion of the course, students should be able to:

1. Classify the hydrocarbon reservoirs and their driving mechanism.
2. Derivation of the material balance equation and calculation.
3. Calculation of oil and gas in place, recovery, produced oil and gas and the remaining of oil and gas for all the types of hydrocarbon reservoirs.
4. Calculating the volume of water encroached using different methods.

B. Skills Outcomes: Upon completion of the course, students should be able to:

1. Deal with all kinds of reservoir.
2. Perform calculations regarding the different types of hydrocarbon reservoirs.
3. Make decisions about the driving mechanisms.

Teaching/learning methods (put your methods of teaching)

1. Lectures. √
2. Class problem solving. √
3. Discussion √

Assessment methods (write your assessment methods)

1. homework problem sets, √
2. exams √

C. Affective value outcomes: Upon completion of the course, students should be able to apply:

1. best methods to study natural sciences √
2. Critical Thinking √
3. Analytical methods in solving problems √

Teaching/learning methods

1. Brain storming √
2. Encourage Critical thinking √
3. Encourage analytical thinking strategy √

Assessment methods

1.Exams √
2. Student feedback √

D. Life learning outcomes: Upon completion of the course, students should be able to:

1. Work within teams
2. Write academic reports
3. Analyse and verify scientific facts
4. Plan and organize time of study
5. Initiate new ideas and motivate others

10. Grading

1.
2.
3.
4.
etc.,

11. Course Content

Week No.	No. of hours	Reference	Topic
1	5		Review of the important topics and definitions in reservoir engineering.
2	5		Reservoir fluids properties, gas oil and water. Bo,Bg,Rs,μo , μg relations with pressure and temperature.
3	5		Calculations related to the reservoir fluids properties.
4			continued
5	5		Classification of the petroleum reservoirs according the P-T relation.
6	5		Types of natural driving mechanisms, liquid expansion, depletion, gas cap, water and combination drive.
7	5		Material balance derivation.
8			continued
9	5		Calculations using the material balance.
10	5		Material balance as a straight line.
11	5		Gas reservoir, dry gas reservoirs-properties and MB calculations.
12	5		Gas storage reservoirs, wet gas reservoirs.
13			continued
14	5		Calculations related to dry gas, wet gas and storage gas reservoirs.
15	5		continued
16			Retrograde gas reservoirs.
17			Continued.
18			Solution of problems for retrograde gas reservoirs gas res.
19			Under saturated oil res., volumetric calculations.
20			Under saturated oil res., material balance calculations.
21			Under saturated oil res., including formation and water Compressibility.
22			Solution of problems.
23			Saturated oil reservoirs
24			Application of material balance for sat. oil res.
25			Solution of problems
26			Water influx, steady state method.
27			Van -Everdingin method.
28			Fetchovich method

29			evaluation
30			Exams.

12. References

1. Textbooks	Applied petroleum reservoir engineering by Craft and Hawkins
2. References	Reservoir Engineering Handbook by Tarek Ahmed
3. Recommended readings	Fundamentals of Reservoir Engineering by L.P.Dake
4. Electronic/ Online references (Available upon request)	**1.** **2.** **3.** **etc.,**

13. Course improvement plan

1.
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etc.,