



وصف البرنامج الأكاديمي و وصف المقررات لقسم هندسة النفط

وزارة التعليم العالي والبحث العلمي جهاز الإشراف والتقويم العدمي دائرة ضمان الجودة والاعتماد الأكاديمي استعارة وصف البرنامج الأكاديمي للكليات والمعاهد الجامعة : كلية الفارابي الجامعة الكلية/ المعهد: كلية الفارابي الجامعة القسم العلمي : هندسة النفط تاريخ ملء الملفهز 19-9-2023 النوقيع : التوقع : اسم رئيس القسم : أد. علي محسن صالح المشاط التاريخ ١٩ التاريخ : ١٩ / ٩ / ٩ : خال دمق الملف من قبل شعبة ضمان الجودة والأداء الجامعي اسم مدير شعبة ضمان الجودة والأداء الجامعي: د. مالرة عبر كالت مع التاريخ 2222 /09 /2023 التوقيع ! مصادقة السيد العميد 9 4/19 - الصفحة 1

### وصف البرنامج الأكاديمي والمقررات لقسم هندسة النفط

كلية الفارابي الجامعة	<ol> <li>1. المؤسسة التعليمية</li> </ol>
هندسة النفط	2. القسم العلمي / المركز
هندسة النفط	3. اسم البرنامج الأكاديمي او المهني
بكالوريوس هندسة النفط	4. اسم الشُّهادة النهائية
سنوي وفصلي	5. النظام الدراسي : سنوي /مقررات /أخرى
برنامج جامعة بغداد كلية الهندسة فسم هندسة النفط	6. برنامج الاعتماد المعتمد
توأمة مع جامعة بغداد - كلية الهندسة- قسم هندسة النفط	7. المؤثرات الخارجية الأخرى
2023-9-18	<ol> <li>٤. تاريخ إعداد الوصف</li> </ol>

9. أهداف البرنامج الأكاديمي

سي**ظهر خريجو برنامج هندسة البترول الكفاءة والتميز في السمات التالية:** 1- المهارات اللازمة لاستخدام الأدوات والتقنيات الهندسية الحديثة لتحديد وحل المشاكل الفنية المرتبطة بإنتاج وإدارة موارد النفط والغاز.

2- القدرة على استكشاف تصميم حديث لتحفيز خزان البترول من خلال برامج حديثة لنمذجة كافة الاستر اتيجيات المطلوبة ووضع استر اتيجيات التطوير.

3- التعامل مع الحفر والإنتاج وهندسة التكوينات المكمنية والمحاكاة الحاسوبية وتعزيز استخلاص النفط
 إلى جانب الدورات الهندسية الأساسية.
 4- القدرة على العمل بشكل فعال في فرق متعددة التخصصات في بيئات متنوعة وإظهار مهارات
 7- الاتصال الفعالة

5- القدرة على التكيف مع التغيير من خلال التأقلم والتعايش مع ظروف العمل في حقول النفط

مخرجات البرنامج المطلوبة وطرائق التعليم والتعلم والتقيم 1. أ. القدرة على التمبيز والتحديد والتعريف وصياغته وحل المشكلات الهندسية من خلال تطبيق مبادئ الهندسة والعلوم والرياضيات. 2. أ. القدرة على إدراك الحاجة المستمرة لنمو المعرفة المهنية وكيفية الوصول إليها وتجميعها وتطبيقها بشكل صحيح. 3. أ القدرة على التواصل بمهارة شفهياً مع مجموعة من الأشخاص وكتابياً مع مختلف المستويات الإدارية. 4. أ. القدرة على العمل بشكل مناسب ضمن الفريق وتحديد الأهداف وتخطيط الأنشطة والوفاء الإدارية. 5. ألقدرة على إدراك المسؤوليات الأخلاقية والمهنية في القضايا الهندسية وإصدار أحكام رائعة مع مراعاة التسلسلات في الأنظمة المالية العالمية. 1. ب الأهداف المهاراتية الخاصة بالموالية العالمية. 2. القدرة على إدراك المسؤوليات الأخلاقية والمهنية في القضايا الهندسية وإصدار أحكام رائعة مع مراعاة التسلسلات في الأنظمة المالية العالمية. 1. ب اجراء البحوث الهندسية والعلمية الأساسية والتطبيقية لتطوير طرق جديدة وأكثر أمانا واقتصادية لاستخراج البترول والغاز الطبيعي من التكوينات الصخرية. 2. ب دمج المعرفة العلمية والهندسية لتصميم وإجراء التجارب وتحليل البيانات.

3 ب- تطبيق الأسس العلمية والهندسية لصياغة الحلول لمشاكل هندسة البترول والغاز الطبيعي.

4 ب - استخدام التقنيات والمهارات والأدوات الهندسية الحديثة في مجال البترول والغاز الطبيعي.

طرائق التعليم والتعلم

1- المناقشة الشفهية

2- التقارير

3- تقديم الفيديو هات
 4- الندوات والعروض التقديمية

5 مجموعات المنافسة

طرائق التقييم

1 المناقشة الصفية

2 التقييم الشفهي

3 الاختبارات الكتابية

4- المناقشة الجماعية

ج-الأهداف الوجدانية والقيمية.

1 ج - القدرة على إدراك المسؤوليات الأخلاقية والمهنية في المواقف الهندسية وإصدار أحكام مستنيرة، والتي يجب أن تأخذ في الاعتبار تأثير الحلول الهندسية في السياقات العالمية والاقتصادية والاجتماعية.
2 ج- الاعتراف بضرورة حماية البيئة والمحافظة عليها قدر الإمكان من خلال منع التلوث من خلال عمليات تطوير الإنتاج والاستكشاف.

طرائق التعليم والتعلم

1. إلقاء محاضرات حول اقتصاديات البترول وحساب الربح لكل عملية إنتاج واستكشاف.

إقامة ندوات حول المفاهيم الأخلاقية في التعامل مع البيئة

3. ترتيب مجموعات فعالة أثناء المحاضرات التعليمية وفي المختبرات لتعريف الطلبة بأجواء الفريق وتعليمهم كيفية التعاون مع بعضهم البعض للوصول إلى أفضل النتائج.

#### طرائق التقييم

1. المناقشة الشفهية

2- تشكيل مجموعات إبداعية وإقامة مسابقة بينها من خلال تقديم مواضيع متخصصة.

3- إعداد التقارير العلمية

4- المشاريع

د -المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي). 1 د- المشاركة في التعلم مدى الحياة

2د- القدرة على التواصل بشكل فعال والعمل ضمن فرق متعددة التخصصات.

3د-القدرة على استخدام التقنيات والمهارات والأدوات الهندسية الحديثة اللازمة لممارسة الهندسة.

4د- القدرة على تطوير وإجراء التجارب المناسبة، وتحليل البيانات وتفسير ها، واستخدام الحكم الهندسي لاستخلاص النتائج.

طرائق التعليم والتعلم

- ممارسات التعلم التأملي.
- 2- استر اتيجيات فعالة لتدوين الملاحظات وتدوينها.
  - 3- محاضرات مؤثرة وجذابة.
  - 4 استخدام عروض PowerPoint.
  - 5- تنشيط الفصل الدر اسى بالنقاش.
  - 6- تنمية قدرة الطالب على توليد الأفكار والأدلة

7- إتاحة الفرصة للطلبة للتعلم من خلال تجارب العمل الواقعية.

### طرائق التقييم

- 1 . الاختبارات والامتحانات الصفية
  - 2 الاستجواب المباشر للطلاب
    - 3 المشاريع
  - 4 التقارير المعملية الاسبوعية
    - 5 المناقشات الصفية.
- 6 .العرض الفعال باستخدام أسلوب مناسب وتنظيم فعال لعرض عمله
- 7 اختيار أو تطوير استراتيجيات التقييم المناسبة لاختبار تعلم الطلاب للمعرفة والمهارات المحددة.
  - 8. استخدام نتائج التقييم لتوفير ملاحظات تكوينية للطلاب الأفراد وتحسين المناهج والتعليمات..

### 10.بنية البرنامج

ت المعتمدة	الساعان		رمز المقرر أو		
عملي	نظري	اسم المغرر أو المساق	المساق	المركلة الدراسية	
2	3	الجيولوجيا العامة	PE100		
-	4	الرياضيات 1	GE102		
2	2	البرمجيات 1	GE104	العرم	
3	1	الرسم الهندسي والهندسة الوصفية	GE106	et k	
-	3	الستاتك والداينمك	GE108	الاولر	
-	1	اللغة الانكليزية 1	GE110	C	
-	2	الفيزياء	GE114		
2	2	الكيمياء التحليلية	GE101		
-	2	اللغة العربية	GE112		
2	2	الجيولوجيا التركيبية	PE200		
-	4	الرياضيات 2	GE202		
2	1	برمجة الحاسبات 2	GE204	_	
-	3	اسس هندسة النفط	PE206	Ta	
-	4	ميكانيك الموائع	GE208	Ţ	
-	1	اللغة الانكليزية 2	GE210	Ę	
2	2	خواص النفط	PE201	ٳؾ	
-	4	الثرموداينمك الهندسي	PE203		
2	3	مقاومة المواد	GE203		
-	2	حقوق الانسان	GE212		
2	4	هندسة المكامن 1	PE300		
2	4	هندسة الحفر 1	PE302	Ĩ	
-	3	هندسة الانتاج 1	PE304	, Ţ	
-	4	تخطيط الابار	PE306	· [沪	
-	2	اقتصاديات النفط	PE308	٤. ۲	
-	4	الرياضيات الهندسية	GE302		

-	1	اللغة الانكليزية 3	GE310	
-	3	الجيوفيزياء	PE301	
-	3	الاحصاء الهندسي	GE303	
-	5	هندسة المكامن 2	PE400	
-	5	هندسة الحفر 2	PE402	
-	5	هندسية الانتاج 2	PE404	-
-	3	استخلاص النفط بالطرق الثانوية	PE406	T T
2	2	النمذجة المكمنية والطرق العددية	PE408	Ţ
2	1	المشروع المهندسي	PE410	3
-	3	تكنولوجيا الغاز	PE401	الع
-	3	الامثلية	PE403	*4
-	2	الادارة المكمنية المتكاملة	PE405	
-	1	اللغة الانكليزية 4	-	

11. التخطيط للتطور الشخصى تحديد النقطة في تعليم الطالب (على سبيل المثال، الدورات، والمختبرات، والتدريب 1 الداخلي) التي ينبغي له فيها تطوير المعرفة والمهارات والمجالات المحددة؛ التعرف على كيفية نقل هذه المهارات والقدرات إلى سياقات أخرى (بما في ذلك سياقات 2 العمل والمهنة)؛ ورش العمل والموارد التي تركز على مجالات مهارات أكاديمية معينة (على سبيل المثال، 3 كتابة المقالات، أو مهارات العرض، أو إدارة أطروحته)؛ تحسين فرص توظيف الطالب والتخطيط لمستقبله المهني. 12. معيار القبول (وضع الأنظمة المتعلقة بالالتحاق بالكلية أو المعهد) المؤهلات الدراسية التي يحق لحاملها التقديم للدراسة في قسم هندسة النفط: 1- خريجى الفرع الاعدادي التطبيقي 2- خريجى الفرع العلمى للسنوات السابقة 3- خريج معهد نفط أو أي معهد بعد المرحلة الإعدادية بشرط ان يكون المتقدم خريج الدراسة الاعدادية / الفرع العلمي. ويعتمد القبول في القسم على معدل السادس الاعدادي، وليس على

مستوى الدراسة بعد الاعدادية. ولكن تضاف له درجتين على المعدل عن شهادة المعهد

اهم مصادر المعلومات عن البرنامج:

 Al-Farabi University College Web Site (<u>http://www.alfarabiuc.edu.iq/</u>)

- Al-Farabi SPE Chapter

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نقولة( نابلية ي)	تأهيلية الم المتعلقة بذ بر الشخص	، العامة وال ت الأخرى ليف والتطو	المهارات المهارا التوظ	مية	دانية والقي	، الوج	الأهداف	اصة	ية الذ ج	اف المهاراة بالبرنام	الأها		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		الأهداف المعرفية		أساس <i>ي</i> أم اختياري	اسم المقرر	رمز المقرر	السنة / المستوى
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الصفحة 13

#### **Republic of Iraq**

Ministry of Higher Education and Scientific Research

AL-Farabi University Collage

**Petroleum Engineering Department** 

# The second secon

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 of	Reference	Tonic						
No	hours	Mererence	Topic						
1	3		introduction						
2	3		Earth in space						
3	3		Surface relief and interior						
Ū	0		of the earth						
4	3	1 1 nlummer Ch C Carleon	Materials and minerals						
5	3	1. 1. plummer, Ch.C., Carlson, DH And Mc Geary D (2007)	Materials and minerals						
6	3	Physical geology. Mc. Graw	Igneous rocks						
7	3	Hill Higher Education. 617 pp.	Igneous rocks						
8	3		Sedimentary rocks						
9	3	2 Montromore CW 1007	Sedimentary rocks						
10	3	2. Montgomery C.W .1997. fundamentals	Sedimentary rocks						
11	3	Tuntumentais	Examination						
12	3		Metamorphic rocks						
13	3		Weathering and soil						
14	3		Weathering and soil						
15	3		Processes of erosion and						
			environment						
<b>12. Re</b>	ference	S							
1. Textb	ooks	Basi ,M.A. 2017 introduction to geo university college.	Basi ,M.A. 2017 introduction to geology, 50 pp. Al Farabi university college.						
2. Refere	ences	<ol> <li>1. 1.plummer, Ch.C, Carlson (2007). Physical geology. M Education. 617 pp</li> <li>2. Montgomery C.W .1997. fu</li> </ol>	<ol> <li>1. 1.plummer, Ch.C, Carlson, DH. And Mc. Geary, D. (2007). Physical geology. Mc. Graw Hill Higher Education. 617 pp</li> <li>2. Montgomery C.W .1997. fundamentals</li> </ol>						
3. Recom readings	nmended s								
4. Electr referenc (Availab request)	onic/ Onl ces lle upon	ine Geology .Wm.c. Brown publi	sher .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:	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									
<ol><li>Course administrator's name (mentior</li></ol>	all, if more than one name)								
Name: Assistant Lecturer khattab imad									
Email: khattab.emad@alfarabiuc.edu.iq									
8. 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. C	ourse Stru	ucture			
Week	Hours	Required Learning Outcomes	Unit or subject	Learning	Evaluation
			name	method	method
	4	Understand the reason behi studying engineering Drawi and its main applicatio Introduction	introduction	pract ng	Class work
		<ul> <li>Dimensions &amp; lettering. • Drawing paper layout.</li> <li>Lines in engineering drawing + (Definitions of point, line, plane, types of even angles and types of planes</li> <li>Descriptive geometry)</li> </ul>	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 vi	iew +	Sketching	practicing					
the two dimensional	en and	auxiliary view						
the two-unitensional				Class				
neluhedron with	11			work				
Evalid's theories								
Euclid S theories	)							
(descriptive geometr	y)			Class				
Multiple exercises appl	Ications	auxiliary view	practicing	Class				
engineering operations	5	Descallel		WOLK				
Definition of projection	IS	Parallel	practicing					
• Parallel projection.+		projection		Class				
Projection and its				work				
types (descriptive geor	netry)							
Orthogonal project	tion.	Orthogonal	practicing	Class				
Representation of solid	ls in plar	projection		work				
(descriptive geometry)				WOIN				
Projection in the first		AutoCAD	practicing	_				
corner.+ AutoCAD				Class				
program (basics)				work				
descriptive engineering	5							
Projection into the thir	d	AutoCAD	practicing					
corner. AutoCAD								
program (its role in fac	ilitating			Class				
the representation of				work				
shapes) descriptive								
engineering								
AutoCAD program (the		AutoCAD	practicing					
most important comma	nds used			Class				
the program the	eoretical			work				
descriptive geometry								
Preparatory week befo	re the fi	AutoCAD	practicing	Class				
Exam				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)	Required textbooks (curricular books, if any) Abd-alrasool Alkhaffaf, Engineering Drawi							
	, e	second Edition,1	990.					

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



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.		<ol> <li>Lectures. 2. Class problem solving 3. Online discussion etc.,</li> </ol>			
10. Co	ourse	Structure			
Week	Hour	Required Learning	Unit or subject	Learning	Evaluation
	S	Outcomes	name	method	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	Conical Section.	Lectures.	Quiz Class work
12-14	8	Section and solve area Understand polar Coordinates and solve Conversion	Polar Coordinates.	Lectures.	Home work 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)	<b>Calculus 008 Edition, Kindle Edition</b>
	by James Stewart.
Main references (sources)	Thomas' Calculus 14th Edition by
	Joel Hass, Christopher Heil, Maurice Weir
Recommended books and references	Vector Algebra and Calculus: Stephen Robe
	Fuente: University of Oxford
(scientific journals, reports)	· ·
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 النفظ

### **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	
<b>1.</b> Quizzes (2 X 4)	8 %
2. Discussion (1 X 5)	5 %
3. Monthly Exams (2 X 6)	12 %
<b>4.</b> Home Works (1 X 5)	5 %
<b>5.</b> Final Exam	70 %

Week No.	No. of	Reference	Торіс
	hours		- -
1 - 4	8	Physics for Scientists and Engin eering with modern Physics,Ra ymond A. Serway., SAUNDERS GOLDEN SUN BRUST SERIES, SAUNDER S 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. Silbe y, R. A. Alberty, M. G. Bawen di, 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 Gr aw Hill, Int. Edition, Physics Series , USA. 1985	Heat Transfer
30	2	-	Lessons Review + Quiz
. Reference	S		
<ol> <li>Physics for Scientists and Engineering with modern Physics, Raymond A. Serway., SAUNDERS GOLDEN SUNBRUST SERIES, SANDERS COLLEGE PUBLISHING, 2004.</li> <li>Fundamentals of Physics, Binder Ready Version 10 Edition David Halliday, Robert Resnick, Jearl Walk Wiley; 10 edition 2013</li> </ol>			

	<ul> <li>Cole ; (9 edition or any recent edition) 2013</li> <li>4. The Physics of Vibrations and Waves H.J. Pain John Wiley &amp; Sons, Sussex 1999</li> </ul>		
	etc.,		
2. References	<ol> <li>Physical Chemistry, R. A. Silbey, R. A. Alberty, M. G. B awendi, Wiley &amp; Sons, 2005.</li> <li>Fundamentals of Statistical and Thermal Physics, Reif F. Mc Gray Hill Int. Edition. Physics Series, USA 1985.</li> </ol>		
	Mc Oraw Hill, Int. Edition, Physics Series, USA. 1965		
	etc.,		
<b>3. Electronic/ Online</b>	https://www.mechanicaltutorial.com/simple-harmonic-motion-		
references (Available	objective-questions-and-answers		
upon request)	https://www.mechanicaltutorial.com/applied-mechanics-objective- questions-and-answers-03		
upon request)			
	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

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

المؤسسة التعليمية 1.	كلية الفارابي الجامعة
القسم العلمي.2	هندسة نفط
اسم / رمز المقرر .3	اللغة العربية
نوع المحاضرة .4	الكتروني
الفصل / السنة .5	الفصل الأول / 2021
الساعات المعتمدة6	6ساعات أسبوعيا
اسم التدريسي .7	م.م الاء عبد القادر خلف محمود

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفظ

اهداف المقرر

في نهاية الفصل الاول سيتمكن الطلاب من :

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

مخرجات المقرر وطرائق التعليم والتعلم

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

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

### 11. المصادر والمراجع

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. **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

(1<sup>st</sup> 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.

<u>3.</u> 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.

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.

د ,.etc

#### Assessment. (All methods)

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

4. etc.,

2

<b>C. Affective value outcomes:</b>	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.

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.

#### **11. Course Content** No. of Reference Topic Week hours No. 10 1 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** 1. 2. references 3. (Available upon etc., request)

## 13. Course improvement plan

1.

2. 3.

3. 4.

#### **Republic of Iraq**

Ministry of Higher Education and Scientific Research

AL-Farabi University Collage

**Petroleum Engineering Department** 

## (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

جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

#### 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. of	Reference	Торіс
No.	hours		
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	quiz
		Title: Engineering Mechanics:	-
		Statics and Dynamics	
		Combination Study Package	
		with MasteringEngineering	
12	3	Author: R.C. Hibbeler	Midterm 1
		Title: Engineering Mechanics:	
		Statics and Dynamics	
		Combination Study Package	
		with MasteringEngineering	
13-14	3	Author: R.C. Hibbeler	Principles of dynamic
15 11	5	Title: Engineering Mechanics:	Theopies of dynamic
		Statics and Dynamics	
		Combination Study Package	
		with MasteringEngineering	
15-17	3	Author: R C. Hibbeler	Rectilinear motion
15-17	5	Title: Engineering Mechanics:	Rectificat motion
		Statics and Dynamics	
		Combination Study Package	
		with MasteringEngineering	
17.19	2	Author: P.C. Hibbeler	Cumulineer motion
1/-18	3	Title: Engineering Machanias	Curvinnear motion
		Station and Dynamics.	
		Statics and Dynamics	
		Combination Study Package	
10	2	with MasteringEngineering	
19	3	Author: R.C. Hibbeler	projeciles
		Title: Engineering Mechanics:	
		Statics and Dynamics	
		Combination Study Package	
		with MasteringEngineering	
20-22	3	Author: R.C. Hibbeler	rotation
		Title: Engineering Mechanics:	
		Statics and Dynamics	
		Combination Study Package	
		with MasteringEngineering	
23	3	Author: R.C. Hibbeler	energy
		Title: Engineering Mechanics:	
		Statics and Dynamics	
		Combination Study Package	
		with MasteringEngineering	
24	3	Author: R.C. Hibbeler	work
	÷	Title: Engineering Mechanics:	
		Statics and Dynamics	
		Combination Study Package	
		with MasteringEngineering	
25-26	3	Author: R.C. Hibbeler	Mechanical vibration
25-20	5	Title: Engineering Mechanics:	
		Statics and Dynamics	
		Combination Study Package	
		with MasteringEngineering	
27	2	Author: P.C. Hibbolar	ania
21	3	Title: Engineering Machanism	quiz
		Station and Dynamics:	
		Combination State Deduce	
		Combination Study Package	
		with MasteringEngineering	
28	3	with MasteringEngineering           Author: R.C. Hibbeler	Midterm exam 2
28	3	with MasteringEngineering           Author: R.C. Hibbeler           Title: Engineering Mechanics:	Midterm exam 2
28	3	with MasteringEngineeringAuthor: R.C. HibbelerTitle: Engineering Mechanics:Statics and Dynamics	Midterm exam 2
28	3	with MasteringEngineeringAuthor: R.C. HibbelerTitle: Engineering Mechanics:Statics and DynamicsCombination Study Package	Midterm exam 2

12. References	
1. Textbooks	<b>1.</b> 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

Republic of Iraq

Ministry of Higher Education and Scientific Research



وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

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

- Analyse and verify scientific facts
   Plan and organize time of study
   Initiate new ideas and motivate others
- 6. conduct targeted searches of scholarly literature.

#### 10. Course Content

Week	No. of	Reference	Topic
No.	hours		-
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 <u>https://cse.unl.edu/~cbourke/ComputerScienceOne.pdf</u> 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.

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**Petroleum Engineering Department** 



جمهورية العراق وزارة التعليم العالي والبحث العلمي كلية الفارابي الجامعة

قسم هندسة النفظ

## **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.

<b>C. Affective value outcomes:</b> Upon completion of the course, students should able to apply:	be
<b>1.</b> Selecting and applying general rules correctly to solve problems including those in real-life contexts.	ng
2. Developing mathematical curiosity and use inductive and deductive reasoning when solving problems.	ve
3. Analytical methods in solving problems.	
etc.,	
Teaching/learning methods	
1. Brain storming.	
2. Encourage Critical thinking.	
3. Encourage analytical thinking strategy.	
4. Introduce confect research methodologies.	
Assessment methods	
1. Exams.	
2. Student feedback.	
3. Problem recognition type.	
4. Assessing skill in problem solving.	
etc.,	
<b>D. Life learning outcomes:</b> Upon completion of the course, students should be ab to:	le
1. Think critically, research and reason.	
2. Apply analytical and theoretical skills to model and solve mathematic	cal
problems.	
3. Analyse data and draw appropriate statistical conclusions.	
etc.	
10. Grading	
1. Quizzes (2 X 4) 8 %	
<b>2.</b> Discussion (1 X 5) 5 %	
<b>3.</b> Monthly Exams (2 X 6) 12 %	
4. Home Works (1 X 5) 5 %	
5. Final Exam 70 %	

11. Course	Content		
Week No.	No. of	Reference	Торіс
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 Svdney	First and Second Differential Equations
30	4	-	Lessons Review + Quiz
12. References			
1. Textbooks1. Calculus 008 Edition, Kindle Edition by James Ste 2. Introduction to Differential Calculus, Chr Thomas, Fuente: The University of Sydney etc.,		indle Edition by James Stewart. Gerential Calculus, Christopher niversity of Sydney	
2. References		<ol> <li>Thomas' Calculus 14th Edition by Joel Hass, Christopher Heil, Maurice Weir</li> <li>Vector Algebra and Calculus: Stephen Roberts Fuente: University of Oxford</li> <li>etc.,</li> </ol>	
3. Electronic/ Online references (Available upon request)		1. <u>https://www.infobooks.c</u> 2. <u>https://people.math.harv</u> <u>Calculus.pdf</u>	org/free-calculus-books-pdf/ vard.edu/~shlomo/docs/Advanced

#### **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

# (Structural & Oil Geology – 2<sup>nd</sup> 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.

# 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.

2. 3.

4.

etc.,

#### **Assessment methods**

1.

2. 3.

з. 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

11. Course Content			
Week No.	No. of hours	Reference	Торіс
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. Refer	rences		
1. Textbooks1. Structural ( 2. Practical pr 3. etc.,		1. Structural ( 2. Practical pro 3. etc.,	Geology by De Sitter Oblems handouts
2. References 1. Pet geology by Liver 2. Subsurface Geologic 3. etc.,		1. Pet geology 2. Subsurface 3. etc.,	by Liverson Geological Methods by Leroy
4. Electronic/ Online1.references2.(Available upon request)3.etc.,			

## 13. Course improvement plan

#### 1. Adding one unit to the Theory

2.

3.

4.

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## (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

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#### 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. of	Reference	Topic
No.	hours		
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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## (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**

Mool	Noof	Deference	Topia
week	NO. 01	Reference	Горіс
NO.	hours		
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	4+2lab		Dynamic flow and types of flow (laminar and
half of			turbulent flow)
year)	4 0 1 1		
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	<ul> <li>Coulson, J.M. and J.F. Richardson, "Chemical Engineering," Vol.I " Fluid Flow, Heat Transfer, and Mass Transfer" 5<sup>th</sup> edition, .(1998)</li> <li>-Holland, F.A. "Fluid Flow for Chemical Engineers" Arnold, .(1980)</li> <li>-Shariff, A. "Hydaulics and Fluid Mechanics" Dhanpatrai and Sons, (1987).</li> <li>-Christi J. Geankoplis "Transport Processes and Unit Operations " 3rd edition Printice Hall International Editions, (1993).</li> <li>-McCabe, W.L., Smith, J.C., and Harriott, P. " Unit Operations of Chemical Engineering" 6th edition McGraw-Hill International Edition, (2001).</li> <li>-Khurmi, R.S. "A Text Book of Fluid Mechanics" 4th edition S.Chand &amp; Company (Pvt.) LTD, (1987).</li> </ul>
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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**Petroleum Engineering Department** 

#### جمهوريه العراق

وزارة التعليم العالي والبحث العلمي

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.

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
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%	 	

Week	No. of	Reference	Торіс
No.	hours		
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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## (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

- 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.

Week	No. of	Reference	Topic
No.	hours		•
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. Refer	ences		
1. Textbook	κs	1. 2. 3. etc.,	
2. Referenc	es	1. Yunus A. Cer 2. Michael A. B 3. eighth editio 4. McGraw Hill	ngel. Boles. on. I education, 2011.

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

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# 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

- 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
Ζ.
3.
4.
etc.,
Teaching/learning methods
4
1.
2.
3.
4.
etc.,
Assessment methods

1
2.
3.
4.
etc.,
<b>C.</b> Affective value outcomes: Upon completion of the course, students
should be able to apply:
1.
2.
3. 4
4. etc
Teaching/learning methods
1.
2.
3.
4.
etc.,
A geogement methods
Assessment methous
1.
2.
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 Crading
IV. GLAUING
1 Ouiz
2 Mid Evomo
3.H.W
3

4.C.W etc.,

Week No.	No. of hours	Reference	Торіс
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	<ol> <li>Reservoir Engineering Handbook</li> <li>Fundamentals of Petroleum and Petrochemical Engineering</li> <li>Drilling Engineering Handbook</li> <li>Petroleum Engineering Handbook - Volume 4</li> <li>Well Logging Handbook</li> </ol>
2. References	<ol> <li>Fundamentals of Petroleum and Petrochemical Engineering</li> <li>The Petroleum Engineering Handbook: Sustainable Operations</li> </ol>

## 13. Course improvement plan

Use and identify sources in various disciplines for reference when needed

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# (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

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.,

X471		D			
week	NO. 01	Reference	Γορις		
NO.	hours				
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. Refer	ences				
1. Textbook	(S	1.			
	-	2.			
		3.			
		etc.,			
2. Reference	es	<b>1. MATLAB® "An Introduction with Applications", Fourth</b>			
		Edition, JOHN WILEY & SONS.			
		2."Fortran for sciences and engineering", Fourth Edition,			
		Stephen J. Chapman			
		3.			
		etc.,			
1 Electropic / Online		1			
4. Electroni	4. Electronic/ Unline		2.		
reierences		3.			
(Available upon		etc			
request)		,			

## 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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### **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	

**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:
<ul><li>1.demonstrate the ability to communicate in a professional manner.</li><li>2. exhibit the ability to work in terms / groups effectively.</li></ul>
B. Skills Outcomes: Upon completion of the course, students should be able to:
<ol> <li>To familiarize the student with the skills required in their workplace as petroleum engineers</li> <li>That the student can link topics and choose the appropriate</li> </ol>
Teaching/learning methods (put your methods of teaching)
<ol> <li>Lectures.</li> <li>Class problem solving.</li> <li>Discussion</li> </ol>
Assessment methods (write your assessment methods)
<ol> <li>homework problem sets,</li> <li>exams</li> <li>lab reports</li> </ol>
<ul> <li>C. Affective value outcomes: Upon completion of the course, students should be able to apply:</li> <li>1. best methods to study natural sciences</li> <li>2. Critical Thinking</li> </ul>
<ol> <li>Analytical methods in solving problems</li> <li>4.</li> </ol>

### 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		Торіс	
1	2	Hand petrol	book of eum refinery	Crude oils (chemical composition, classification, properties)	
2	2	Hand	book of	density, specific gravity	
3	2	Hand	book of	coefficient of expansion, viscosity, molecular weight	
4	2	Hand	book of	vapor pressure, specific heat, latent heat	
5	2	Handb	ook of um refinery	heat of combustion, boiling range	
6	2	Handb petrole	ook of um refinery	pour point, sulfur content, aniline point	
7	2	Handb petrole	ook of um refinery	penetration number, softening point	
8	2	Handb petrole	ook of um refinery	crude oil evaluation, fractional distillation and TBP curve	
9	2	Handb	ook of um refinery	analysis of fraction, dehydration of crude oil	
10	2	Handb	ook of um refinery	natural gas properties	
11	2	Handbook of petroleum refinery		oilfield water properties.	
12	2	-	•	quizzes	
13	2			Midterm exam	
14					
15					
11. Refere	nces				
1. Textboo	ks				
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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# (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



- **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)

homework problem sets,
 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  $\checkmark$

### **Teaching/learning methods**

1. B	rain storming $$
2. Ei	ncourage Critical thinking V
3. Ei	ncourage analytical thinking strategy $\gamma$
Asses	ssment methods
1.Ex	ams 🗸
2. St	udent feedback 🗸
D. Lif	e learning outcomes: Upon completion of the course, student
shoul	d be able to:
1.	Work within teams
2.	Write academic reports
2	

- Analyse and verify scientific facts
   Plan and organize time of study
   Initiate new ideas and motivate others

## 10. Grading 1. 2. 3. 4. etc.,

Week	No. of	Reference	Торіс	
1	<b>110013</b>		Review of the important topics and definitions in	
I	2		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		Continuer Interest	
20	2		continued	
20	2			
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. Refer	ences		
1. Textbook	KS		
		Abdel-Aal, H. & Alsahlawi, M. (2014). Petroleum economics & engineering, 3rd ed. USA: Taylor & Francis Group, LLC.	
2. Reference	es		
		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.

3. 4.

etc.,

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# (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	

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

<b>1.Theoritical</b>	part:	30	%
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2.	lab.	part	:	20%
_	1401	puit		

3. Final exam : 50%



Week	No. of	Reference	Торіс
No.	hours		
1	4	Drilling methods	Rotary drilling and its equipment, density
		and types of mud	calculations and additions
2	4	Drilling methods	Rotary drilling and its equipment, density
		and types of mud	calculations and additions
3	4	Drilling methods	Rotary drilling and its equipment, density
		and types of mud	calculations and additions
4	4	Drilling methods	Rotary drilling and its equipment, density
		and types of mud	calculations and additions
5	4	Drilling methods	Rotary drilling and its equipment, density
		and types of mud	calculations and additions
6	4	Drilling methods	Rotary drilling and its equipment, density
		and types of mud	calculations and additions
7	4	drilling problems	Types of Bits, loss of drilling fluid, stuck of pipes
		and bit types	
8	4	drilling problems	Types of Bits, loss of drilling fluid, stuck of pipes
		and bit types	
9	4	drilling problems	Types of Bits, loss of drilling fluid, stuck of pipes
10	-	and bit types	
10	4	drilling problems	Types of Bits, loss of drilling fluid, stuck of pipes
	-	and bit types	
11	4	drilling problems	Types of Bits, loss of drilling fluid, stuck of pipes
10	-	drilling problems	Types of Dits loss of drilling flyid stuck of nings
12	4	and bit types	Types of Bits, loss of drifting fluid, stuck of pipes
10	4	Coloulations of	circulation processor processor drop during the
15	4	bydraulia	drilling fluid evelo
		pressure loss	
14	4	Calculations of	circulation pressure pressure drop during the
17	Т	hydraulic	drilling fluid cycle
		pressure loss	
15	4	Calculations of	circulation pressure, pressure drop during the
10		hydraulic	drilling fluid cycle
		pressure loss	
16	4	Design of the	Design of the drill pipe and drill Collar and its
		drill string and	equipment
		its equipment	
17	4	Design of the	Design of the drill pipe and drill Collar and its
		drill string and	equipment
		its equipment	
18	4	Design of the	Design of the drill pipe and drill Collar and its
		drill string and	equipment
		its equipment	
19	4	Design of the	Design of the drill pipe and drill Collar and its
		drill string and	equipment
		its equipment	
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20	A	Cosing design	coloction of hit types of easing
20	4	and bit selection	selection of bit, types of casing
21	4	Casing design and bit selection	Design factors
22	4	Casing design	selection of bit, types of casing
		Casing design	
23	4	and bit selection	selection of bit, types of casing
24		Cementing	Types of cement, Methods of cementing and
		operations and	calculation
	4	calculations for	
		cementing	
		operations	
25	4	Cementing	Types of cement, Methods of cementing and
		operations and	calculation
		calculations for	
		cementing	
		operations	
26	4	Cementing	Types of cement. Methods of cementing and
_0	-	operations and	calculation
		calculations for	
		cementing	
		operations	
27	4	Cementing	Types of cement Methods of cementing and
27	Т	operations and	calculation
		calculations for	
		cementing	
		operations	
20	1	Undroulio	Hydraulic of comparing job
20	4		Tryuraune of cementing job
		Dressure loss	
		alculation	
20			Hadrent's of concerting ist
29	4	Hydraulic	Hydraulic of cementing job
		calculation	
		Pressure loss	
		calculation	
30	4	Hydraulic	Hydraulic of cementing job
		calculation	
		Pressure loss	
		calculation	
12. Refei	rences		
1. Textbooks		1. Drilling Engi	neering I by Akram hamoody Alhiti
		2.	
		3.	
		etc.,	
		,	
			6

2. References	<ul><li>1-Rig hydraulic</li><li>2-Applied drilling Engineering</li><li>3- drilling mud technology</li></ul>
3. Recommended readings	<ol> <li>SPE journal</li> <li>JPT journal</li> </ol>
4. Electronic/ OnlineDrilling Manualsreferenceswww.spe.org(Available upon request)	

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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## **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	<b>GE302</b> 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 %
<b>3.</b> Monthly Exams	12 %
4. Home Works	5 %
<b>5.</b> Final Exam	70 %

11. Course Content			
Week No.	No. of	Reference	Торіс
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

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	<b>NCICI CIICCS</b>	

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

**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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## (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	<ol> <li>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.</li> <li>Laboratory lectures where students perform special experiments to measure reservoir rock and fluid properties.</li> </ol>
5. Semester/Year	The course is yearly.
6. No. of credit hours	<ol> <li>Theoretical part of 4 hours/week.</li> <li>Practical part of 2 hours/week.</li> </ol>
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 4<sup>th</sup>, Year Reservoir Engineering-2 class based on the knowledge they got in their 3<sup>rd</sup>. 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 4<sup>th</sup>. 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. of	Reference	Торіс
No.	hours		•
1	4 Theoretical 2 Lab.	<ol> <li>Reservoir Engineering Handbook Tarek Ahmed.</li> <li>Applied Petroleum</li> </ol>	<ol> <li>What is reservoir engineering and with what it works</li> <li>Introduction on rules of working in the laboratory and main experiments to be taken during the year.</li> </ol>
2	4 Theoretical 2 Lab.	Reservoir Engineering Craft & Hawkins 3. Fundamentals	<ol> <li>Types of petroleum reservoirs and how a reservoir is formed.</li> <li>1st. experiment; How to cut a small specimen (Plug) of a rock for testing.</li> </ol>
3	4 Theoretical 2 Lab.	of Reservoir Engineering L.P. Dake. 4. Petroleum	<ol> <li>Porosity; Theory, Definition, Formula, Types, Calculation.</li> <li>Rock plug grinding and preparation for testing.</li> </ol>
4	4 Theoretical 2 Lab.	Wikipedia 5. Special professional	<ol> <li>Methods of measuring porosity.</li> <li>Core cleaning with Soxhlete extraction Method.</li> </ol>
5	4 Theoretical 2 Lab.	articles from the internet. 6. Laboratory	<ol> <li>Averaging Porosity method.</li> <li>Water content measurement by Dean &amp; Stark method.</li> </ol>
6	4 Theoretical 2 Lab.	Catalogues and my own Lab. Experience and Knowledge.	<ol> <li>Determination of Oil In Place (OIP) &amp; Gas in Place (GIP); Formulas and Calculation.</li> <li>Pressure Gauges calibration with Dead Weight Tester method.</li> </ol>
7	4 Theoretical 2 Lab.		<ol> <li>Permeability; Theory, Definition, Formula, Calculation, Types.</li> <li>Lab. Measurement of Porosity by Liquid Saturation method</li> </ol>
8	4 Theoretical 2 Lab.		<ol> <li>Permeability Averaging methods and calculations.</li> <li>Lab. Gas Permeability Measurement.</li> </ol>
9	4 Theoretical 2 Lab.		1. Fluid Saturation; Definition, Formula, Types of Saturations in the reservoir.

r	1	
		2. Lab Liquid Permeability
		Measurement.
10	4 Theoretical	1. Wettability Phenomena in a
	2 Lab.	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	1. P-T Diagram and the H-C
	2 Lab.	reservoir Classification.
		2. Reservoir PVT Analysis and the
		calculation of Reservoir fluid
		properties.
12	4 Theoretical	1. Reservoir Gas properties (Ideal and
	2 Lab.	Real Gas); Density, Gravity,
		Apparent Molecular Weight, z-
		Factor, Bg.
		2. Determination of Saturation
		Pressure of Reservoir Crude Oil
13	4 Theoretical	1. PVT Analysis of Reservoir Crude
	2 Lab.	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	<b>1.</b> Flow regimes in Oil reservoirs and
	2 Lab.	their Calculation.
		2. Calculation of Reservoir oil Bo and
		Drawing its graph using PVT Data.
15	4 Theoretical	<b>1.</b> Flow regimes in Oil reservoirs and
	2 Lab.	their Calculation.
		2. Review of all experiments and
		answering student questions before
<u> </u>		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	<b>1.</b> 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	1. Own PDF lectures used in Online Lectures using	
references (Available	Google Class room and Google Meet Technique.	
upon request)	2. Some internet videos for explain some lab.	
	Experiments presented through Google Meet	
	Technique.	

- 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.

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## **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	Торіс	
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, McIntyre		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		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	2. References	8			
1.	Textbooks		<ol> <li>Business results – Internet Newton</li> <li>English for Petroleum, I etc.</li> </ol>	ermediate – John Hughes, John Ken McIntyre	
2.	References	]	Interchange, Jack C. Ritchards, fourth editionetc., 2005. etc.,		
3. re uj	Electronic/ O ferences (Ava oon request)	nline <u> </u> ilable	https://www.cambridgeengli etc.,	<u>sh.org/</u>	

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

etc.,

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## (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
	0 110 110
7 Instructor Name	Amiod Abdulgodin
7. Instructor Name	Amjeu Abuulqaun

#### 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	Торіс
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	1-Well logging and formation evaluation by Toby
references	Darling,2005
(Available upon	2-Logs interpretation charts.Edition 2009 by Schlumberger
request)	

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.

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.

3. 4.

etc.,

#### **Assessment methods**

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

etc.,

L. Affe	ctive value outcomes: Upon completion of the course, students
should	be able to apply:
1. 1	hey become able to read and try interpreting geophysical maps.
2. 3	
etc	
0000	
Teachi	ng/learning methods
1. As	above
2.	
3.	
4.	
etc.,	
Asses	sment methods
1. As	above
2.	
3.	
4.	
etc.,	
D. Life	e learning outcomes: Upon completion of the course, students
should	be able to:
1. T	hey should be able to use the references they may need.
2.	
3.	
4.	
etc.,	
10. <b>Gr</b>	ading according to results in a number of tests
1	Yearly work 30%
1.	

etc.,

## **11. Course Content**

Week	No. of	Reference	Торіс		
No.	hours				
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. Refer	rences				
1. Textbooks1. In 2. Ha 3. Ap etc.,		1. Introduction 2. Handout no 3. Applied pro etc.,	n to applied geophysics by M. Dobrin tes blems		
2. References 2. 3. etc.,		1. Geophysica 2. 3. etc.,	ll approach		
4. Electronic/ Online references (Available upon request)		e 1. Google mee 2. Google clas 3. etc.,	et ssroom		

### 1. Adding one practical unit

2.

3.

4.

etc.,



كلية الفارابي الجامعة قسم هندسة النفط

#### **Course Description Form**

1. Course Maine.
------------------

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)

				<ul> <li>determining oil production rate without coning).</li> <li>Completion efficiency.</li> <li>Drill Stem Test (DST):(Test Method, Equipment, Pressure versus Time Curve, Theory of Pressure Buildup, Reservoir Properties Obtained, Depletion).</li> <li>Helical Bucking of Tubing (Forces, Homogeneous Completion, Packers Permitting Free and Limited Motions, Compound Completion of Wells).</li> <li>Surface Gathering Systems (Types of Gathering Systems, Behavior of Fluid Flow, Flow Lines, Essential Flowing Lines, Valves).</li> <li>Separation of Oil, Gas, and Water: (Types of Separators, components of separators and functions).</li> <li>Oil storage (storage tanks and accessories, calibration, measurement of liquid level).</li> <li>Production by Pumps: (Sucker Pump, Electrical Submersible Pumps).</li> </ul>		
9. Te	aching	and Learning Strat	egies			
Strategy       1. Brain storming.         2. Encourage Critical thinking.         3. Encourage analytical thinking strategy.         4. Introduce correct research methodologies.						
10. Cour	rse Str	ructure				
Week H	lours	Required Learning Unit or subject Learning Evaluati			Evaluation	
		Outcomes	name		method	method

11. Course Evaluation		
<ol> <li>Quizzes.</li> <li>Classwork.</li> <li>Homework.</li> <li>Monthly exams.</li> </ol>		
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	

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)
<b>10.</b> 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
- **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 %
<b>3.</b> Home Works	5 %
<b>4.</b> Lab.	20%
5. Final Exam	50 %

Week No.	No. of	Reference	Торіс
	hours		
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.	<b>Reservoir Simulation.</b>
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 throug Porous Medium
15	4	-	Lessons Reviews + Monthly Exan
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 Differenc 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.	Transmissibility, the Finite Difference form of flow equatio

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. Reference	es		
1. Textbooks	books - Petroleum Reservoir Simulation A Basic Approach Abou-Kassem J. H., Farouq Ali S. M. and Islam M.		mulation A Basic Approach by ouq 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/st	udies/courses/TPG4160#tab=omE mnet

- **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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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

# (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

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. of	Reference	Topic
No.	hours		•
1	3	Enhanced oil	Principles and definitions choice of proper
		recovery	methods for enhanced oil recovery
2	3	Enhanced oil	Recovery by water displacement, Buckley-
		recovery	Leverett method, Welge method, Stiles method
3	3	Enhanced oil	Original and improved Dyktsra-Parsons method,
		recovery	Pattern of flooding
4	3	Enhanced oil	Sweep efficiency
		recovery	
5	3	Enhanced oil	Properties of injected water, Injected pressures
		recovery	
6	3	Enhanced oil	Recovery by immiscible gas
		recovery	
7	3	Enhanced oil	Tarner method, Muskat method, Recovery by
-		recovery	miscible gas
8	3	Applied	Dry gas injection, Enriched gas injection
		Petroleum	
		Reservoir	
		Engineering by	
0	2	Ronald	CO2 injustion N2 injustion
9	3	Applied	CO2 injection, N2 injection
		Petroleum	
		Finding or ing by	
		Engineering by Popold	
10	2	Annlied	Thermal recovery heat flow through rocks
10	5	Petroleum	Therman recovery, heat now through rocks
		Reservoir	
		Engineering by	
		Ronald	
11	3	Applied	Steam injection
	_	Petroleum	U U
		Reservoir	
		Engineering by	
		Ronald	
12	3	Applied	In-situ combustion
		Petroleum	
		Reservoir	
		Engineering by	
		Ronald	
13	3	Applied	Tertiary oil recovery
		Petroleum	
		Reservoir	
		Engineering by	

		Ronald	
14	3	Applied Petroleum Reservoir Engineering by	Surfactant flooding, Solvent injection
15	3	Applied Petroleum Reservoir Engineering by Ronald	Polymer injection.
12. Refer	ences		
<ol> <li>Textbooks</li> <li>References</li> </ol>		1. Enhanced oil 2. 3. etc., 1. Applied Petr Terry, J. Bra 2. The reservo 3. Enhanced oil	recovery [Green,_Don_W.;_Willhite,_GPaul] roleum Reservoir Engineering by Ronald E. ndon Rogers ir engineering aspects of waterflooding il recovery [Marcel_Latil]
3. Recommended readings		etc., Applied Petrol Terry, J. Bra	leum Reservoir Engineering by Ronald E. ndon Rogers
4. Electronic/ Online references (Available upon request)		1. 2. 3. etc.,	

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

**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

( 4<sup>th</sup> 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

1. To study advance scientific work

2.

<u>3.</u> 4.

**T**.

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.

د ,.etc

## Assessment. (All methods)

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

4. etc.,

<b>C. Affective value outcomes:</b>	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.,

<b>11. Cour</b>	se Con	tent	
Week	No. of	Reference	Торіс
No.	hours		
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. Refer	ences		
I. Textbool	KS	1. Headway pl	us ( upper intermediate ) by John and Liz Soars
		2.	
		J. etc	
2. Referenc	es	1.	
	-	2.	
		3.	
		etc.,	
Decomm	andod		
3. Kecommended			
cauiigs			
1. Electroni	c/Online	1.	
eferences		2.	
Available	unon	3.	
	"Pon	etc.,	

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

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**Petroleum Engineering Department** 



جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

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

- 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. of	Reference	Торіс
No.	hours		
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	Gas Sweetening and Dehydration

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.,

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

Ministry of Higher Education and Scientific Research

AL-Farabi University Collage

**Petroleum Engineering Department** 

# (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

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفظ

جمهورية العراق

- 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	Торіс
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 F 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.,

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. **Ministry of Higher Education** 

AL-Farabi University Collage

**Petroleum Engineering Department** 



جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

قسم هندسة النفط

### **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

- 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
<ol> <li>Demonstrate the ability to analyze and solve advanced drilling engineer problems.</li> <li>Demonstrate the ability to communicate analysis in a professional manner.</li> <li>Exhibit the ability to work in teams/groups effectively</li> </ol>
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
<ol> <li>Lectures.</li> <li>Class problem solving.</li> <li>Discussion</li> </ol>
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

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

30	3	FAINAL EXAM	
2. Refere	ences		

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.



AL-Farabi University Collage

Petroleum Engineering Department



جمهورية العراق

وزارة التعليم العالي والبحث العلمي

كلية الفارابي الجامعة

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	<b>Reservoir engineering II- PE400</b>
4. Lecture Type	Theoretical
5. Semester/Year	year

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

- 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)

homework problem sets,
 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  $\checkmark$

#### **Teaching/learning methods**
1.	Brain storming $$	
2. 3.	Encourage analytical thinking $$	
SSG	ssment methods	
1.I	xams 🗸	
2.	Student feedback $$	
. L	fe learning outcomes: Upon completion of the course, stude	ents
lou	d be able to:	
1	Work within teams	
1.		

- Analyse and verify scientific facts
  Plan and organize time of study
  Initiate new ideas and motivate others

## 10. Grading 1. 2. 3. 4. etc.,

## **11. Course Content**

Week	No. of hours	Reference	Торіс
1	5		Review of the important topics and definitions in
			reservoir engineering.
2	5		Reservoir fluids properties, gas oil and water.
			temperature.
3	5		Calculations related to the reservoir fluids properties.
4			continued
5	5		Classification of the petroleum reservoirs according
6	5		Types of natural driving mechanisms liquid
Ū	0		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
10			res.
20			Under saturated oil res., volumetric calculations.
20			Under saturated off res., material balance calculations.
21			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.

2. 3.

3. 4.

etc.,