وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي
قسم الاعتماد

دليل وصف البرنامج الأكاديمي والمقرر

2026

نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة تكريت

الكلية / المعهد: كلية هندسة العمليات النفطية

القسم العلمي: قسم هندسة تكرير النفط والغاز

اسم البرنامج الأكاديمي أو المهني: دراسات أولية - بكالوريوس علوم في هندسة تكرير النفط والغاز

اسم الشهادة النهائية: بكالوريوس علوم في هندسة تكرير النفط والغاز

النظام الدراسي: سنوي

تاريخ إعداد الوصف: 8 / 3 / 2026

تاريخ ملء الملف: 8 / 3 /2026

التوقيع:

اسم رئيس القسم: أ.م.د. قحطان عدنان محمود

التاريخ: ١١ / ٣ / 2026

التوقيع:

اسم المعاون العلمي: م. حمد خضير محمد

التاريخ: ١١ / ٢ / 2026

دقق الملف من قبل:

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: م.د. عدنان ابراهيم احمد

التاريخ: ١١ / ٣ / 2026

التوقيع

أ.م.د. غسان حمد عبدالله

٢/١١ / 2026

مصادقة السيد العميد

1. رؤية البرنامج
الارتقاء بالمستوى التعليمي للقسم وفق أحدث الأساليب.

2. رسالة البرنامج
خدمة المجتمع من خلال تطوير الصناعة النفطية في المحافظة وفي البلد.

3. اهداف البرنامج
1- تزويد الطلبة بأساسيات المعرفة العلمية في تخصص هندسة تكرير النفط والغاز وتحسين قدراتهم المهنية في اتجاه التفكير التحليلي والابداعي من خلال استخدام تقنيات المعلومات وتحليل البيانات والطرق التجريبية الحديثة في صياغة وحل المشكلات. 2- اعداد مهندسين مؤهلين بشكل جيد للارتقاء بنشاطات هندسة العمليات النفطية والقدرة على ادارة التعامل معها في كافة مرافق الحياة وخاصة في مجال الصناعات النفطية. 3- اجراء البحوث العلمية ذات الطابع الأكاديمي لمواكبة المسيرة العلمية العالمية والبحوث ذات الطابع التطبيقي لترجمة المعرفة الهندسية ونظرياتها الى واقع عمل بمعالجة المشاكل التي يعاني منها البلد في كافة المجالات. 4- المساهمة بشكل او بآخر من حيث التصميم والاشراف والمتابعة والاستشارة لإعادة اعمار البلد بقطاعات الصناعات النفطية والبتروكيمياوية مع تقديم الاستشارات الهندسية واعداد دراسات الجدوى الاقتصادية وتصاميم المشاريع وتوفير الخدمات الفنية. 5- تأصيل الرصانة العلمية وجعلها سمة لهذا القسم وفق ضوابط ومعايير عالمية.

4. الاعتماد البرامجي
لا يوجد

5. المؤثرات الخارجية الاخرى
هل هناك جهة راعية للبرنامج؟ (فقط مؤسسات الدولة المختلفة للتدريب الصيفي لطلبة المرحلة الثالثة)

6. هيكلية البرنامج				
هيكل البرنامج	**عدد المقررات**	**وحدة دراسية**	**النسبة المئوية**	**ملاحظات**
متطلبات المؤسسة	7	18	%11	/
متطلبات الكلية	9	32	%20	/
متطلبات القسم	22	112	%69	/
التدريب الصيفي	1	/	/	/
أخرى	/	/	/	/

* ممكن ان تتضمن الملاحظات فيما إذا كان المقرر أساسي او اختياري.

7. وصف البرنامج				
السنة / المستوى	رمز المقرر أو المساق	اسم المقرر أو المساق	الساعات المعتمدة	
			نظري	عملي
أربع سنوات	BSc-PGR	بكالوريوس علوم في هندسة تكرير النفط والغاز	176	56

8. مخرجات التعلم المتوقعة للبرنامج
المعرفة
أ1- التعليم الواسع المدى لفهم تأثير الحلول الهندسية عالميا واقتصاديا.
أ2- القدرة على العمل في الفرق متعددة التخصصات.
أ3- امكانية تطبيق العلوم المعرفية كالرياضيات والعلوم التطبيقية والصرفة.
أ4- القدرة على استخدام التقنيات والمهارات وادوات الهندسة المعاصرة في المجال الهندسي للصناعات النفطية والبتروكيمياوية.
أ5- القدرة على تصميم المنظومات النفطية والبتروكيمياوية لتفي بالحاجات المطلوبة خلال المحددات الواقعية من النواحي الاقتصادية.
أ6- امكانية تصميم وتنفيذ التجارب وتحليل النتائج وترجمتها واقعيا.
المهارات
ب1- تنمية وتطوير قدرة وقابلية الطالب على استخدام البرامج التصميمية في مجال الاختصاص.
ب2- تنمية وتطوير قدرة وقابلية الطالب على التعامل مع التقنيات الحديثة الخاصة بمفردات المقرر.
ب3- تنمية وتطوير قدرة وقابلية الطالب على مواجهة المشاكل والمعضلات وإيجاد الحلول المناسبة لها.
ب4- تنمية وتطوير قدرة وقابلية الطالب على ترجمة المعلومات الأكاديمية إلى الواقع العملي.
القيم
ج1- القدرة على اتخاذ القرار.
ج2- طرق الابتكار لدى الطلبة.
ج3- قدرة الطالب على التفكير.
ج4- جمع البيانات المطلوبة لإنجاز موضوع معين.
ج5. التفكير الابداعي لدى الطلبة ومواكبة أحدث الوسائل العلمية المتاحة في التعليم والتعلم.
9. استراتيجيات التعليم والتعلم
1. عرض مفردات المقرر الدراسي على الطلبة (المحاضرات).

2. أمثلة عديدة يتم تفصيلها لتوضيح المبادئ الأساسية.
3. استراتيجية ثابتة لحل المسائل يمكن تطبيقها على أي مسألة.
4. استخدام الأشكال والرسومات والرسوم البيانية لتقديم وصف تفصيلي وتعزيز لما يقرأه الطالب.
5. اختبارات التقييم الذاتي في نهاية كل فصل مع الإجابات لتقييم مدى التقدم في التعلم.
6. مناقشة وحل العديد من المسائل في الفصول التعليمية، والتي تتيح العمل مع زميل أو أكثر لتبادل الأفكار ومناقشة المادة.
7. تكليف الطلبة بالواجبات، مثل كتابة اوراق بحثية ليكتسب الطلبة مهارات التعلم الذاتي والتقديم.
8. اجراء الامتحانات المفاجئة.
9. اجراء الامتحانات الفصلية والنهائية بالمواعيد المحددة.
10. اعلام الطلبة عن كيفية احتساب الدرجات للطلبة خلال الفصل الدراسي وبنتائجهم الامتحانية ومناقشة الاخفاقات والنجاحات.
11. اعلام الطلبة بالكتب المنهجية والكتب المساعدة التي يحتاجونها في مفردات المقرر الدراسي منه مع اجراء استبيان للسنوات السابقة لتحسين المنهج وتحسين اداء التدريسيين ورفع مستوى الطالب.
12. تدريب الطلبة في مؤسسات الدولة المختلفة (المرحلة الثالثة).

10. طرائق التقييم

1. الاختبارات الشهرية والنهائية.
2. الاختبارات القصيرة والمفاجئة والمشاركة داخل القاعة الدراسية.
3. تقديم الواجبات البيتية والأوراق البحثية والتقارير العلمية.
4. الاداء ألمختبري.

11. الهيئة التدريسية

أعضاء هيئة التدريس

الرتبة العلمية	التخصص		المتطلبات/المهارات (ان وجدت)	اعداد الهيئة التدريسية	
	عام	خاص		ملاك	محاضر
أستاذ	5	-		5	-
أستاذ مساعد	3	-		3	-
مدرس	9	-		9	-
مدرس مساعد	11	-		11	-

التطوير المهني

توجيه أعضاء هيئة التدريس الجدد

برامج تهيئة واعداد على شكل محاضرات وندوات مفتوحة مع ورش تدريبية تتضمن:

1. تعريف أعضاء هيئة التدريس الجدد برؤية الجامعة ورسالتها وبنيتها التنظيمية وسياساتها وإجراءاتها.
2. تمكين أعضاء هيئة التدريس الجدد من الحصول على فهم أفضل لحقوقهم والتزاماتهم إضافة الى حقوق وواجبات الطلاب.

3. تزويد أعضاء هيئة التدريس الجدد بمعلومات مفصلة حول مرافق وخدمات الجامعة والكلية والقسم.

4. تعريف أعضاء هيئة التدريس الجدد بجودة البرنامج الدراسي والاعتماد البرامجي.

5. تعريف أعضاء هيئة التدريس الجدد بمصادر التعلم وبرامج البحث العلمي.

التطوير المهني لأعضاء هيئة التدريس

1. توظيف طرائق ووسائل تدريس حديثة.
2. تبادل الخبرات مع أساتذة في كليات وجامعات أخرى.
3. المشاركة في تقويم وتطوير المنهج وتحليله.
4. التقويم المستمر للمقررات من خلال التغذية الراجعة من قبل التدريسيين والطلبة.
5. الانفتاح على كل ما هو جديد.

12. معيار القبول

1. خريج الدراسة الإعدادية الفرع العلمي (تطبيقي).
2. القبول يكون لكلا الجنسين (ذكور وإناث).
3. الحد الأدنى لمعدل القبول يتم تحديده من قبل المراجع العليا والمتمثلة بقسم القبول المركزي في وزارة التعليم العالي والبحث العلمي.
4. رغبة الطالب او ولي امره للدراسة في القسم.

13. أهم مصادر المعلومات عن البرنامج

1. الكتب المنهجية.
2. الهيئة التدريسية.
3. ورش العمل والندوات والمؤتمرات.
4. المواقع الالكترونية والمكتبة الالكترونية.
5. السوق المحلية وحاجتها.

14. خطة تطوير البرنامج

1. تحديث المناهج الدراسية بصورة مستمرة لتواكب المناهج الدراسية في الجامعات العالمية والرصينة وحاجات سوق العمل المحلي.
2. زيادة الاهتمام بالجانب العملي من خلال توفير الأجهزة المختبرية التعليمية الحديثة وفتح مختبرات جديدة.
3. توفير الكتب العلمية الحديثة المنهجية والمصدرية ومن دور نشر عالمية لمكتبة القسم.
4. تضمين التطورات العلمية والتكنولوجية على المستوى العالمي في المناهج الدراسية والتجارب العملية.
5. تصميم وتنفيذ برامج تطويرية على شكل محاضرات وندوات مفتوحة مع ورش تدريبية للكوادر التدريسية والوظيفية.
6. ابرام مذكرات تفاهم مع مؤسسات الدولة في مجال تبادل الخبرات واجراء البحوث والدراسات العلمية.

مخطط مهارات البرنامج

مخرجات التعلم المطلوبة من البرنامج

السنة/ المستوى	رمز المقرر	اسم المقرر	اساسي ام اختياري	المعرفة	المهارات	القيم

الأولى				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4
الثانية															
الثالثة															
الرابعة															

*يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم

نموذج وصف المقرر

1. اسم المقرر	
2. رمز المقرر	
3. الفصل / السنة	
4. تاريخ إعداد هذا الوصف	
5. أشكال الحضور المتاحة	
6. عدد الساعات الدراسية (الكلي) / عدد الوحدات (الكلي)	
7. اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر)	
الاسم:	الآيميل:
8. اهداف المقرر	
اهداف المادة الدراسية	• .... • .... • ....
9. استراتيجيات التعليم والتعلم	

الاستراتيجية	

10. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم

11. تقييم المقرر

توزيع الدرجة من 100 على وفق المهام المكلف بها الطالب مثل التحضير اليومي والامتحانات اليومية والشفوية والشهرية والتحريرية والتقارير... الخ

12. مصادر التعلم والتدريس

الكتب المقررة المطلوبة (المنهجية أن وجدت)	
المراجع الرئيسة (المصادر)	
الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير...)	
المراجع الإلكترونية، مواقع الانترنيت	

الوصف الاكاديمي
المرحلة الثانية -الفصل الاول

	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Computer II	**Module Delivery**	
Module Type	Basic	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOT031		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	2	**Semester of Delivery**	1
Administering Department	PGR	**College**	PPE
Module Leader	Tahsin ALI	**e-mail**	muayad.abed@tu.edu.iq
Module Leader's Acad. Title	Asst. Lecturer.	**Module Leader's Qualification**	MSC
Module Tutor	-	**e-mail**	-
Peer Reviewer Name	-	**e-mail**	-
Review Committee Approval		**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	-
Co-requisites module	None	**Semester**	-
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	TODAY its impossible to imagine live without computers or other digital devices. Nowadays knowing how to use a computer is need.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Utilize the computer for fundamental tasks 2. Identify and discuss the hardware components of the computer system 3. Creating documents using a word processor and creating presentations 4. Conducting research on the internet 5. An introduction to Artificial intelligence		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: 1. **Security and networking: what is network.** Types of networks. Basic network components. Network security basic. Understanding network threast. Network troubleshooting [2 hrs]. 2. **E-Commerce: concepts of electronic banking services this include online banking:** ATM and debit card services, phone banking, SMS banking, electronic alert, mobile banking [2 hrs]. 3. **Computer troubleshooting**: identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues [4 hrs]. 4. **Introduction to AL**: definition of AL, History of AL, AL Techniques and approaches, challenges and Ethical considerations [4 hrs]. 5. **AL in Our Daily lives:** AL in smartphones and virtual assistants like Siri or Google Assistant [4 hrs]. 6. **Application of AL**: Education, Healthcare, Finance, Transportation, Marketing and Advertising. [6 hrs]. 7. **AL and Society**(How AL affects social AL AND international relations AL and the future of humanity. [2 hrs]. 8. Ethical Challenges in AL(AL ethics ,privacy and surveillance, the impact of AL on the job market) [2 hrs]. 9. **The future of AL**(future trends in AL, recent research and emerging technologies [2 hrs]		
Learning and Teaching Strategies استراتيجيات التعلم والتعليم			
Strategies	The students will be actively engaged in the tasks, which will help them develop and hone their critical thinking abilities. This will be accomplished		

	via lectures, interactive labs, and assignments incorporating fascinating tasks. The course includes: 1- Numerous examples worked out in detail to illustrate the basic principles. 2- A consistent strategy for problem solving that can be applied to any problem. 3- Figures, sketches, and diagrams to provide a detailed description and reinforcement of what you read. 4- Self-Assessment Tests at the end of each section, with answers so that you can evaluate your progress in learning. 5- Many problems will be discussed and solved in the classes and labs, which offer working with one or more classmates to exchange ideas and discuss the material.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	5, 12	LO #1, 2, 5 and 6
	Assignments	3	15% (10)	Continuous	-
	labs	-	-	-	-
	Report	1	5%	-	-
Summative assessment	**Midterm Exam**	3 hr	10% (10)	7	LO #1-4
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري والعملي

	Material Covered
Week 1	**Security and networking: what is network.** Types of networks. Basic network components. Network security basic. Understanding network threast. Network troubleshooting
Week 2	**E-Commerce: concepts of electronic banking services this include online banking:** ATM and debit card services, phone banking, SMS banking, electronic alert, mobile banking
Week 3	**Computer troubleshooting**: identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.
Week 4	**Computer troubleshooting**: identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.
Week 5	**Introduction to AL**: definition of AL, History of AL, AL Techniques and approaches, challenges and Ethical considerations
Week 6	**Introduction to AL**: definition of AL, History of AL, AL Techniques and approaches, challenges and Ethical considerations
Week 7	**AL in Our Daily lives:** AL in smartphones and virtual assistants like Siri or Google Assistant
Week 8	**AL in Our Daily lives:** AL in smartphones and virtual assistants like Siri or Google Assistant
Week 9	**Application of AL**: Education, Healthcare, Finance, Transportation, Marketing and Advertising.
Week 10	**Application of AL**: Education, Healthcare, Finance, Transportation, Marketing and Advertising.
Week 11	**Application of AL**: Education, Healthcare, Finance, Transportation, Marketing and Advertising.
Week 12	**AL and Society**(How AL affects social AL AND international relations AL and the future of humanity.
Week 13	**Ethical Challenges in** AL(AL ethics ,privacy and surveillance, the impact of AL on the job market)
Week 14	**The future of AL**(future trends in AL, recent research and emerging technologies)
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Graham brawn, David Watson, "Cambridge IGCSE Information and Communication Technology', 3rd edition(2020)	NO

Recommended Texts	Ahmed Banafa, “introduction to Artificial intelligence(AL)”, 1st Edition (2024) الدكتور عادل عبد النور ,"مدخل الى عالم الذكاء الاصطناعي" 2005	No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	English language II	**Module Delivery**	
Module Type	Basic	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOT021		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UGII	**Semester of Delivery**	3
Administering Department	PGR	**College**	PPE
Module Leader	Ahmed Mhmood Shihab	**e-mail**	-
Module Leader's Acad. Title	Asst. Prof.	**Module Leader's Qualification**	PhD
Module Tutor	Sundus Hussein Yusuf	**e-mail**	-
Peer Reviewer Name	-	**e-mail**	-
Review Committee Approval	16-9-2024	**Version Number**	2.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	-
Co-requisites module	None	**Semester**	-
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	This course is designed to provide students with foundational English language skills specific to the oil and gas industry. It focuses on essential vocabulary, technical terms, and communication strategies needed to work effectively in an English-speaking petrochemical environment. The course prepares students to engage in work-related discussions, understand safety protocols, and manage technical documentation.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course, students should be able to: 1. Understand and apply key oil and gas vocabulary. 2. Describe equipment, processes, and systems relevant to petroleum operations. 3. Follow and give instructions in English for technical and safety-related tasks. 4. Read and write technical reports, diagrams, and safety documentation. 5. Use English confidently in work-related conversations.		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: This course is divided into three modules, covering essential topics such as: 1. Module 1: Training skills, numbers and measurement, and describing equipment. 2. Module 2: Giving instructions, describing systems, and safety procedures. 3. Module 3: Making comparisons, describing processes, and expressing possibility. The syllabus includes technical terms for equipment, safety protocols, and various processes in the oil and gas industry		
Learning and Teaching Strategies استراتيجيات التعلم والتعليم			
Strategies	Students will participate in interactive discussions, group activities, and individual exercises designed to improve both their technical vocabulary and their practical language skills. There will be a focus on real-world industry scenarios, including safety protocols and technical reporting.		

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	31	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	19	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/ Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	5, 12	LO# 1-4
	Online Assignment	1	5% (5)	6	LO# 1-3
	Onsite Assignment	1	5% (5)	13	LO# 4-5
	Seminars	2	10% (10)	4, 11	LO# 2 and 5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO# module 1-2
	Final Exam	3 hr	50% (50)	16	All LOs
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Training Skills (Module 1)
Week 2	Numbers and Measurement
Week 3	Describing Equipment
Week 4	Giving Instructions (Module 2)
Week 5	Describing Systems
Week 6	Safety
Week 7	Midterm Exam
Week 8	Making Comparisons (Module 3)
Week 9	Describing Processes
Week 10	Expressing Possibility

Week 11	Group Discussions and Case Studies
Week 12	Technical Report Writing
Week 13	Technical Report Writing
Week 14	Mock Presentations
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	English for Oil and Gas - Foundation Course, Peter Levrai.	Yes
Recommended Texts	New headway plus pre-intermediate student's and work books, Liz and John Soars. English for the Energy Industries: Oil, Gas and Petrochemicals, Peter Levrai and Fiona McGarry.	Yes No
Websites	-	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Fluid Flow I	**Module Delivery**	
Module Type	Core	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	PGR212		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	**Semester of Delivery**	3
Administering Department	PGR	**College**	PPE
Module Leader	Qahtan Adnan Mahmood	**e-mail**	Qahtan.adnan@tu.edu.iq
Module Leader's Acad. Title	lecturer	**Module Leader's Qualification**	PhD
Module Tutor	Rasha Khalid Ahmed	**e-mail**	-
Peer Reviewer Name	-	**e-mail**	-
Review Committee Approval	16-9-2024	**Version Number**	2.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Identify the key fluid properties used in the analysis of fluid behavior 2. Calculate common fluid properties given appropriate information 3. Determine the pressure at various location in a fluid at rest 4. Calculate flowrate using the continuity equation 5. Discuss the application of newton's second law to fluid flows 6. Use the Bernoulli equation to solve simple flow problems 7. Calculate force and torques using the linear momentum and momentum-of- momentum equation 8. Use the energy equation to account for losses due to friction as well as effect of pumps and turbines 9. Develop a set of dimensional variable for a given flow situation
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Use the concepts of viscosity, flowrate, and stress of fluid 2. Explain the concept of manometers and apply appropriate equations to determine the pressure 3. Explain the development, uses, and limitations of the Bernoulli equation 4. Apply the concepts of static, stagnation, dynamic, and total pressure 5. Calculate flowrate and type of flow 6. Calculate the net force during the flow 7. Calculate the power require for pump or generated by turbine 8. Apply the Buckingham pi theorem
Indicative Contents المحتويات الإرشادية	1. Calculate the density, specific weight, and specific gravity. Use the concept of viscosity to calculate the shearing stress in simple fluid flows. [12 hrs] 2. Calculate the pressure at various location within compressible fluid at rest, determine pressure from measurements using various types of manometers.[10 hrs] 3. Types of Flow, Conservation of Mass, Bernoulli Equation, and Energy relationships and the Bernoulli equation. [22 hrs]

	4. Momentum of a Flowing Fluid, Total Force Due to Flow, Non-Newtonian Behavior. Dimensional Homogeneity/ Method of Repeating Variables.[15 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	I divided the students into groups to encourage student's participation in the exercises and discussion during solving the problems. Make a report concerning the subject of the lectures, and do seminars to present the work. Show movies to simplify the understanding of materials and make science visits to oil refinery

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation
تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20	6, 11	LO# 1-8
	Online Assignments	2	10	5, 10, 14	LO #1-3, 5-7
	Onsite Assignments	1	5	8	LO #5-6
	Report+ seminars	1	5	10	LO# 1-6
Summative assessment	**Midterm Exam**	1	10	7	LO# 1-4
	Final Exam	1	50	16	All
Total assessment					

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Properties of fluids
Week 2	Stress in fluids
Week 3	Newton's law of viscosity
Week 4	Pressure at a point
Week 5	Variation of pressure with depth
Week 6	Pressure measurement devices
Week 7	Types of flow
Week 8	Conservation of mass
Week 9	Bernoulli Equation/ static, stagnation, dynamic, and total pressure
Week 10	Energy relationships and the Bernoulli equation
Week 11	Momentum of a flowing fluid
Week 12	Total force due to flow
Week 13	Non-Newtonian behavior
Week 14	Dimensional homogeneity/ method of repeating variables
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fluid Flow for Chemical Engineers, Second edition. F, A. Holland	Yes
Recommended Texts	Chemical Engineering Fluid Mechanics, Darby	Yes
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Material engineering and Corrosion			**Module Delivery**	
Module Type	Basic			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	PGR216				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGII	**Semester of Delivery**		3
Administering Department		PGR	**College**	PPE	
Module Leader	Rasha Khalid Ahmed		**e-mail**	-	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		PhD
Module Tutor	-		**e-mail**		
Peer Reviewer Name		-	**e-mail**	-	
Review Committee Approval			**Version Number**		1.0

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	-
Co-requisites module	None	**Semester**	-

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	Provide the students the engineering material specification, properties, processing, and testing as well as corrosion, its types, and how to prevent.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Ability to deal with mechanical, physical, and chemical properties of engineering materials, such as metals, ceramics, polymers, and composites. 2. Ability to predict and control material properties through an understanding of atomic, molecular, crystalline, and microscopic structures of engineering materials. 3. Ability to synthesis and processing of advanced materials for manufacturing. 4. Ability for choosing the suitable material in designing chemical vessels. 5. Ability to understand the relation between properties and structure. 6. Prepares students to apply their understanding of the processing, application, and sustainable use of engineering materials to the realization of new ideas coming from engineers, scientists, enterprises, and society. 7. Ability to understand how corrosion happens, its types, and how to prevent it.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: 1. Introduction to basic material: Basic atom structure and bonding [2 hrs]. 2. Crystal structure, geometry and space lattices [3 hrs]. 3. Imperfection and defects [3 hrs]. 4. Diffusion [3 hrs]. 5. Mechanical properties of material and types of mechanical testing [3 hrs]. 6. Phase diagram and transformation [4 hrs]. 7. Metal and alloy system (types, processing, and applications) [3 hrs]. 8. Polymer and rubber systems (types, processing, and applications) [4 hrs]. 9. Composite system (types, processing, and applications) [3 hrs]. 10. Ceramic and Refractory (types, processing, and applications) [3 hrs]. 11. Corrosion: Degradation of materials and prevention [12 hrs].

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The students will be actively engaged in the tasks, which will help them develop and hone their critical thinking abilities. This will be accomplished via lectures, interactive tutorials, and assignments incorporating fascinating tasks. The course includes: 1- Numerous examples worked out in detail to illustrate the basic principles. 2- A consistent strategy for problem solving that can be applied to any problem. 3- Figures, sketches, and diagrams to provide a detailed description and reinforcement of what you read. 4- Self-Assessment Tests at the end of each section, with answers so that you can evaluate your progress in learning. 5- Many problems will be discussed and solved in the classes and tutorials, which offer working with one or more classmates to exchange ideas and discuss the material.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	55	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	4, 11	LO #1-2, and 4-5
	Onsite Assignments	2	10% (10)	5, 12	LO# 3, 6
	Seminar	1	5% (5)	9	LO #5
	Report	1	5% (5)	14	LO #7
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO #1-4
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري والعملي

	Material Covered

Week 1	Introduction
Week 2	Crystal structure, geometry, and space lattices
Week 3	Imperfection and defects
Week 4	Diffusion
Week 5	Mechanical properties of material
Week 6	Phase diagram and transformation
Week 7	Metal and alloy system
Week 8	Polymer and rubber systems
Week 9	Composite system
Week 10	Ceramic and Refractory
Week 11	Corrosion
Week 12	Corrosion
Week 13	Corrosion
Week 14	Corrosion
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of Materials Science and Engineering, W. D. Callister and D. G. Rethwisch, 4th ed., 2018.	Yes
Recommended Texts	1. An Introduction to Material Engineering and Science: For chemical and material engineers, Brian S. Mitchell, 1st ed., 2003. 2. Material Science and Engineering: An introduction, W. D. Callister and D. G. Rethwisch, 10th ed., 2018. 3. Material science S.L, Kakani and A. Kakani, 1st ed., 2017.	No
Websites	-	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Engineering Mathematics I	**Module Delivery**	
Module Type	Basic	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	PGR211		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	**Semester of Delivery**	3
Administering Department	PGR	**College**	PPE
Module Leader	Omar Ibrahim Farhan	**e-mail**	-
Module Leader's Acad. Title	Asst. Lect.	**Module Leader's Qualification**	M.Sc.
Module Tutor	-	**e-mail**	-
Peer Reviewer Name	-	**e-mail**	-
Review Committee Approval	16-9-2024	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	PGR123	**Semester**	2
Co-requisites module	None	**Semester**	-

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- Discussing and understanding Euler's Method, Applications, Graphical Solutions of Autonomous Eq. 2- Understanding Infinites Sequences and Series. 3- Understanding Ratio & Root Tests and Alternating series. 4- Understanding the Convergence of Taylor series, The Binomial series, Euler's Identity. 5- Recognize the conversion of equations from the (x, y) coordinate to the polar coordinate and understanding polar coordinate.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course, students should be able to: 1- The ability to apply of Euler's Method. 2- The ability to solve Infinites, Sequences and Series. 3- The ability to apply series tests such as Ratio, Root Tests and Alternating series. 4- Finding the Convergence of Taylor series, The Binomial series, and Euler's Identity. 5- The ability to apply polar coordinate.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Euler's Method, Applications, Graphical Solutions of Autonomous Equation. 4 hrs • Infinites Sequences and Series. 8 hrs • Ratio & Root Tests, Alternating series. 4 hrs • Convergence of Taylor series, The Binomial series, Euler's Identity. 4 hrs • Polar coordinates. Graphing in polar coordinates. 4 hrs • Areas & lengths in polar coordinates. 4 hrs • Conic sections, Conics in polar coordinates. 4hrs • Vectors, Vector in plane, vector length, & vector between two points & vector in space. 8 hrs • The Dot Product and the Cross Product. 4 hrs • Lines & Planes in Space (Eqn. of Line in Plane & Space). 4 hrs • Equation of Plane and application. 4 hrs • Arc length in space, curvature and Normal vectors of a curve. 4hs

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	We worked in to divide the students into groups to encourage student's participation in the exercises and discussion during solving the problems. Make a homework concerning the subject of the lectures.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/ Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	5, 12	LO# 1-4
	Online Assignment	1	5% (5)	8	LO# 1-4
	Onsite Assignment	2	10% (10)	6, 13	LO# 1-5
	Seminars	1	5% (5)	11	LO# 5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO# 1-3
	Final Exam	3 hr	50% (50)	16	All LOs
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Euler's Method, Applications, Graphical Solutions of Autonomous Equation
Week 2	Infinites Sequences and Series
Week 3	Infinites Sequences and Series
Week 4	Ratio & Root Tests, Alternating series
Week 5	Convergence of Taylor series, The Binomial series, Euler's Identity
Week 6	Polar coordinates. Graphing in polar coordinates
Week 7	Areas & lengths in polar coordinates

Week 8	Conic sections. Conics in polar coordinates
Week 9	Vectors, Vector in plane, vector length, & vector between two points & vector in space
Week 10	Vectors, Vector in plane, vector length, & vector between two points & vector in space
Week 11	The Dot Product, The Cross Product
Week 12	Lines & Planes in Space (Eqn. of Line in Plane & Space)
Week 13	Equation of Plane and application
Week 14	Arc length in space, curvature and Normal vectors of a curve
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Thomas Calculus 12th Ed.	Yes
Recommended Texts	James Stewart Calculus 8th Ed.	Yes
Websites	-	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

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	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Petroleum chemistry			**Module Delivery**	
Module Type	CORE			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	PGR215				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UGII	**Semester of Delivery**		3
Administering Department		PGR	**College**	PPE	
Module Leader	Ayoob Ibrahim Mohammed		**e-mail**	ayoob.i.mohammed@tu.edu.iq	
Module Leader's Acad. Title			**Module Leader's Qualification**		MSc
Module Tutor	N/A		**e-mail**	N/A	
Peer Reviewer Name		-	**e-mail**	-	
Scientific Committee Approval Date		14-9-2024	**Version Number**		2.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	PGR 124	**Semester**	2

Co-requisites module	None	Semester	-

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To study the chemical composition of crude oil 2. To study the classification of crude oil based on API, Kw, VGC, paraffin & sulfur content, and correlation index method. 3. To study the chemical composition and physical properties of petroleum products and natural gas. 4. To study the type of distillation curves of crude oil and petroleum products.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. knowing the PIONA, sulfur, nitrogen, and oxygen compounds present in crude oil. 2. Knowing the light, medium, heavy, paraffinic, naphthenic, aromatic base crude oils 3. Have basic knowledge about how crude oil can be fractionated into final products. 4. Knowing the main components of NG and LPG with their physical properties. 5. Knowing the PNA composition of Naphtha with carbon and boiling point range. 6. Knowing the PNA composition of Gasoline, RON&MON, RVP, copper strip test. 7. Knowing the PNA composition of kerosene, Flash, Smoke, Aniline points. 8. Knowing the PNA composition of AGO, DI, sulfur and nitrogen content, viscosity and CFP. 9. Knowing the PNA composition of fuel oil and lubricating oils properties. 10. Knowing the PNA composition of AR, VR and Bitumen properties. 11. Knowing the API, ASTM d86, and ASTM D1160 curves. 12. Knowing the TBP, EVF, and SD curves for crude oil and petroleum products.
Indicative Contents المحتويات الإرشادية	Part A: Definition of crude oil and studying its chemical and elemental composition, hydrocarbon and non-hydrocarbon constituents, and SNO content [12 hr.]. Part B: The basic concept of ADU and VDU of crude oil [4 hr.]. Part C: Study the chemical and physical properties of petroleum products [20 hr.] Part D: API gravity and distillation curves of petroleum products [20 hr.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to motivate students' participation in the class by raising questions and inquiries while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, symposiums, simple experiments that are interesting to the students, and self-assessment tests.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	5 and 10	#1 - #5, #6 - #10
	Assignments	2	4% (4)	4 and 13	#1- #4 and #5 - #12
	Lab assignments	2	6% (6)	7 and 14	All
	Lab reports	5	10% (10)	2, 3, 6, 8, 10	#5, and #6 - #12
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	#1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Materials Covered
Week 1	The chemical composition of crude oil
Week 2	The hydrocarbon and non-hydrocarbon constituents of crude oil
Week 3	The classification of crude oil.
Week 4	The technological classification of crude oil.
Week 5	The atmospheric and vacuum distillation of crude oil.
Week 6	The chemical and physical properties of natural gas and LPG.
Week 7	The chemical and physical properties of total naphtha.
Week 8	The chemical and physical properties of gasoline.
Week 9	The chemical and physical properties of kerosene.
Week 10	The chemical and physical properties of atmospheric gas oil.
Week 11	The chemical and physical properties of fuel oil.
Week 12	The chemical and physical properties of AR and VR and petroleum coke.
Week 13	The API gravity and distillation curves of crude oil and petroleum products

Week 14	The API gravity and distillation curves of crude oil and petroleum products
Week 15	**Preparatory week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to laboratory of petroleum chemistry
Week 2	Lab 2: Determining the API gravities of crude oils
Week 3	Lab 3: Determining the API gravities, Specific gravities, and relative densities of petroleum products
Week 4	Lab 4: Determining the PNA composition of Gasoline by gas chromatography
Week 5	Lab 5: Determining the PNA composition of kerosene by gas chromatography
Week 6	Lab 6: Determining the PNA composition of light gasoil by gas chromatography
Week 7	Lab 7: ASTM D86 distillation curves of light and middle distillates
Week 8	Lab 8: ASTM D1160 distillation curves of heavy distillates
Week 9	Lab 9: TBP experiment for crude oil
Week 10	Lab 10: EFV experiment for crude oil and light distillates

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Characterization of petroleum products by Riazi	Yes
Recommended	Handbook of Petroleum Refining Processes by Meyers	No
Websites	https://www.sciencedirect.com/book/9780444527851/fundamentals-of-petroleum-refining	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Thermodynamics I			**Module Delivery**	
Module Type	CORE			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	PGR213				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	UGII		**Semester of Delivery**	3	
Administering Department	PGR		**College**	PPE	
Module Leader	Mayson Anwar Abdullah		**e-mail**	-	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	PhD	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		

Review Committee Approval	14-9-2024	**Version Number**	2.0

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	PGR121	**Semester**	2
Co-requisites module	None	**Semester**	-
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	The module aims to provide students with a solid understanding of the principles and applications of thermodynamics, enabling them to apply these concepts to solve problems and analyze various systems and processes.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	● Understand the concepts of thermodynamics, heat, and work. ● Identify the application and characteristics the first law of thermodynamics, Joule's experiment. Internal energy, Enthalpy. Steady-State steady-flow processes. ● Develop Equilibrium and the phase rule. Reversible processes. Processes at constant volume and constant pressure. Heat capacities. ● Able to apply volumetric properties of pure fluid, PV- T diagrams. Ideal gas. Virial equation and its applications. Cubic equations of state. Generalized correlations for gases and liquids. ● Identify the application and characteristics second law of thermodynamics: Statement of the second law. Heat engines. Carnot cycle. Thermodynamic scale of temperatures. Entropy. The third law of thermodynamics.		
Indicative Contents المحتويات الإرشادية	● Undergraduate review (4 hr). ● Introduction to thermodynamics (4 hr). ● Basic concepts and definitions (system, surroundings, boundary, state, equilibrium, etc.) (4 hr). ● Laws of thermodynamics (First law of thermodynamics (conservation of energy), Second law of thermodynamics (entropy and energy transfer), Third law of thermodynamics and absolute zero. (18 hr). ● Properties of pure substances: Properties of substances and equations of state Phase diagrams and phase transitions, Ideal gas law and real gas behavior. (12 hr). ● Energy and heat transfer: Forms of energy (internal energy, potential energy, kinetic energy, Heat, work, and energy transfer mechanisms Heat capacity and specific heat. (14 hr).		

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is: • Encourage students' participation in the exercises, • Refining and expanding their critical thinking skills. This will be achieved through classes and interactive tutorials. • By considering the type of simple experiments involving some sampling activities that are interesting to the students. • Developing students' abilities in research by asking students to group discussion sessions. • Urging students to look at sources, books and the Internet as a source of information in addition to homework.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/ Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	5, 12	LO# 1-5
	Online Assignment	1	5% (5)	8	LO# 1-3
	Onsite Assignment	2	10% (10)	6, 13	LO# 1-4
	Seminars	1	5% (5)	10	LO# 1-4
Summative assessment	**Midterm Exam**	3 hr	10% (10)	7	LO# 1-3
	Final Exam	3 hr	50% (50)	16	All LO
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The rate of reaction, Order of reaction, Molecularity, Half-life period
Week 2	Simple reaction, Type of order reaction, zero order reaction, First order reaction Second order reaction
Week 3	Third order reaction, Methods for measuring order of reaction
Week 4	Theories of chemical reactions
Week 5	Methods for measuring the order of reaction
Week 6	The Scope of Thermodynamics, Force, Temperature, Work, Energy, Heat.
Week 7	Fundamental concepts and definitions - closed, open and isolated system - intensive and extensive properties - path and state functions –reversible and irreversible process - temperature - Zero law of thermodynamics.
Week 8	First law of thermodynamics – internal energy - enthalpy - heat capacity.
Week 9	First law for cyclic, non-flow and flow processes – applications.
Week 10	P-V-T behavior of pure fluids - ideal gases and ideal gas processes.
Week 11	Equations of state - Vander Waals equation, Redlich-Kwong equation, Virial equation - principle of corresponding states - critical and pseudo critical properties - Compressibility charts.
Week 12	Second law of thermodynamics: Statement of the second law. Heat engines. Carnot cycle.
Week 13	Thermodynamic scale of temperatures. Entropy.
Week	The third law of thermodynamics

14	
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Introduction to Chemical Engineering Thermodynamics by J.M. Smith, Hendrick Van Ness, Michael Abbott, Mark Swihart, 7th Edition	Yes
Recommended Texts	Fundamentals of Chemical Engineering Thermodynamics by Themis Matsoukas	No
Websites	-	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

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الوصف الاكاديمي

المرحلة الثانية -الفصل الثاني

	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	FLUID FLOW II	**Module Delivery**	
Module Type	CORE	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☒ **Practical** ☒ **Seminar**	
Module Code	PGR222		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	**Semester of Delivery**	4
Administering Department	PGR	**College**	PPE
Module Leader	Qahtan Adnan Mahmood	**e-mail**	Qahtan.adnan@tu.edu.iq
Module Leader's Acad. Title	lecturer	**Module Leader's Qualification**	PhD
Module Tutor	Qahtan Adnan Mahmood	**e-mail**	Qahtan.adnan@tu.edu.iq
Peer Reviewer Name		**e-mail**	
Review Committee Approval		**Version Number**	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	10. Discusses the main properties of laminal and turbulent pipe flow 11. Determine the velocity distribution and friction in pipe 12. Estimate minor losses in pipe transitions 13. Calculate parameters related to centrifugal pumps 14. Connect the pumps in series and parallel 15. Calculate flowrate and velocity in pipe and open channel 16. Describe the gas flow through a converging-diverging nozzle 17. Explain the development of boundary layers in external and internal flows
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	6. Derive an expression for the frictional head loss in pipe flow 7. Calculate head loss and pressure drop through laminal and turbulent flow 8. Describe the performance characteristics of centrifugal pumps 9. Calculate the discharge through a pipe by employing venturimeter, and orifice meter 10. Calculate the discharge through an open channel by employing V-notch or rectangular notch 11. Calculate the velocity and pressure drop for gas flow 12. Establish the boundary layer equations for laminar and turbulent flow
Indicative Contents المحتويات الإرشادية	5. Reynolds number and flow patterns in pipes and tubes. Shear stress in a pipe. Friction factor and pressure drop. Pressure drop in fittings, coils and curved pipes. Velocity profile for laminar and Turbulent Newtonian flow in a pipe [22 hrs] 6. Pump characteristic curve, Pump Cavitation and Net Positive Suction Head/ Pumps in Series and Parallel .[10 hrs] 7. Flow Rate and Velocity Measurement in pipe, Open channel flow. [8 hrs] 8. Flow of compressible fluids in conduits, isothermal and Non-isothermal flow of an ideal gas in a horizontal pipe, gas compression and compressors. Laminar and turbulent Boundary Layer

	Equations [16 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	I divided the students into groups to encourage student's participation in the exercises and discussion during solving the problems. Make a report concerning the subject of the lectures, and do seminars to present the work. Show movies to simplify the understanding of materials and make science visits to oil refinery

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	87	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20	6, 13	LO# 1,2,3 ,4, 10,11,12 and 13
	Assignments	2	10	4, 7	LO #1-5, 7-10
	Projects / Lab.	1	10	continues	
	Report				
Summative assessment	**Midterm Exam**	1	10	9	LO# 1-8
	Final Exam	1	50	16	All
Total assessment					

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Reynolds number and flow patterns in pipes and tubes
Week 2	Shear stress in a pipe

Week 3	Friction factor and pressure drop
Week 4	Pressure drop in fittings, coils. and curved pipes
Week 5	Velocity profile for laminar and Turbulent Newtonian flow in a pipe
Week 6	Pump characteristic curve
Week 7	Pump Cavitation and Net Positive Suction Head/ Pumps in Series and Parallel
Week 8	Flow Rate and Velocity Measurement in pipe
Week 9	Open channel flow
Week 10	Flow of compressible fluids in conduits
Week 11	Isothermal and Non-isothermal flow of an ideal gas in a horizontal pipe
Week 12	Gas compression and compressors
Week 13	Laminar Boundary Layer Equations
Week 14	Turbulent Boundary Layer Equations
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Flow through a converging-diverging duct
Week 2	Study of flow rate measuring devices
Week 3	Impact of a jet on vanes
Week 4	Flow over a notch or a weir
Week 5	Head loss in pipe transition
Week 6	Major and minor loss in pipe
Week 7	Performance characteristics of a centrifugal pump

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fluid Flow for Chemical Engineers, Second edition. F, A. Holland	

Recommended Texts	Chemical Engineering Fluid Mechanics, Darby	
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Crimes of AL Baath Regime			**Module Delivery**	
Module Type	Basic			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOT005				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	UGII		**Semester of Delivery**	4	
Administering Department	PGR		**College**	PPE	
Module Leader	الهام روكان عبد		**e-mail**		
Module Leader's Acad. Title	Asst. Lecturer		**Module Leader's Qualification**	PhD	
Module Tutor	-		**e-mail**	-	
Peer Reviewer Name	-		**e-mail**	-	
Review Committee Approval	-		**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	-

Co-requisites module	None	**Semester**	-

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. بيان الحقوق المعرفية التي تهتم بالحقبة التي حكم فيها حزب البعث العراق من خلال توعية الأجيال الحالية والقادمة بانتهاكات حقوق الانسان والجرائم ضد الإنسانية ومن ضمنها المقابر والإبادة الجماعية.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. تزويد الطالب بالمعرفة العامة عن حقبة حكم حزب البعث المغبور 2. تزويد الطالب بالمعرفة العامة عن حقوق الانسان 3. التعرف إلى الجرائم ضد الإنسانية ومن ضمنها المقابر والإبادة الجماعية فترة حكم حزب البعث 4. ممارسة القراءة للتعرف على حقوق الانسان والعدالة المجتمعية واثر الحروب على البيئة
Indicative Contents المحتويات الإرشادية	يتضمن المحتوى الارشادي ما يأتي: 1. انتهاكات الحقوق والحريات (2 ساعة) 2. الانظمة بصفة عامة (2 ساعة) 3. انتهاكات الحقوق الفكرية (2 ساعة) 4. انتهاك الحريات العامة (2 ساعة) 5. انتهاك الحق في التعددية الحزبية (2 ساعة) 6. انتهاك حرية الرأي (2 ساعة) 7. الحقوق الاجتماعية الأخرى (2 ساعة) 8. الانتهاكات التي مارسها النظام البعثي (2 ساعة) 9. اثر سلوكيات النظام في المجتمع (ساعة) 10. السلطات الثلاث في ظل النظام السابق (ساعة) 11. العدالة (2 ساعة) 12. الميدان النفسي و الميدان الاجتماعي (2 ساعة) 13. الدين والدولة (2 ساعة) 14. الثقافة والاعلام في المجتمع و أثر الحروب على البيئة والسكان (2 ساعة)

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	1. عرض مفردات المقرر الدراسي على الطلبة (المحاضرات). 2. تكليف الطلبة بالواجبات، مثل كتابة اوراق بحثية ليكتسب الطلبة مهارات التعلم الذاتي والتقديم. 3. اجراء الامتحانات المفاجئة. 4. اجراء الامتحانات الفصلية والنهائية بالمواعيد المحددة. 5. اعلام الطلبة عن كيفية احتساب الدرجات للطلبة خلال الفصل الدراسي وبنتائجهم الامتحانية ومناقشة الاخفاقات والنجاحات. 6. اعلام الطلبة بالكتب المنهجية والكتب المساعدة التي يحتاجونها في مفردات المقرر الدراسي منة خلال استبيان للسنوات السابقة لتحسين المنهج وتحسين اداء التدريسيين ورفع مستوى الطالب.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	31	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem)	19	**Unstructured SWL (h/w)**	1.43

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	4, 10	
	Online Assignments	2	10% (10)	5, 11	
	Onsite discussions	1	5% (5)	8	
	Report	1	5% (5)	13	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	انتهاكات الحقوق والحريات
Week 2	الانظمة بصفة عامة
Week 3	انتهاكات الحقوق الفكرية
Week 4	انتهاك الحريات العامة
Week 5	انتهاك الحق في التعددية الحزبية
Week 6	انتهاك حرية الرأي
Week 7	الحقوق الاجتماعية الأخرى
Week 8	الانتهاكات التي مارسها النظام البعثي
Week 9	اثر سلوكيات النظام في المجتمع
Week 10	السلطات الثلاث في ظل النظام السابق
Week 11	العدالة
Week 12	الميدان النفسي و الميدان الاجتماعي
Week 13	الدين والدولة

Week 14	الثقافة والاعلام في المجتمع و أثر الحروب على البيئة والسكان
Week 15	**أسبوع تحضيري قبل الامتحان**
Week 16	**امتحان نهاية الفصل**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	جرائم نظام البعث في العراق / مقرر دراسي للجامعات الحكومية والاهلية	نعم
Recommended Texts		كلا
Websites	-	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	Engineering Mathematics II	**Module Delivery**	
Module Type	Basic	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	PGR211		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	**Semester of Delivery**	3
Administering Department	PGR	**College**	PPE
Module Leader	Yousif Saleh Issa	**e-mail**	-
Module Leader's Acad. Title	Lect.	**Module Leader's Qualification**	M.Sc.
Module Tutor	-	**e-mail**	-
Peer Reviewer Name	-	**e-mail**	-
Review Committee Approval	16-9-2024	**Version Number**	1.0

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	PGR123	**Semester**	2
Co-requisites module	None	**Semester**	-

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	• Understanding the partial derivatives and Chain Rule • Understanding Partial Derivatives (Total Derivative, Transformation, & Corresponds Equation) • Understanding Extreme values & Saddle points. Partial Derivatives with constrained variables • Understanding Double & Iterated Integrals over Rectangle, Double Integrals. • Determination area by double integrals, Double integrals in polar form • Determination Triple integrals in rectangular coordinates, Moments & centers of mass. Triple integrals in cylindrical & spherical coordinates. • Understanding Matrix: The unit matrix, types of matrix & matrix algebra. Reduction formula for evaluating the determination.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course, students should be able to: Ability to solve the partial derivatives and Chain Rule • The ability to solve Partial Derivatives (Total Derivative, Transformation, & Corresponds Equation) • Finding Extreme values & Saddle points. Partial Derivatives with constrained variables • Finding Double & Iterated Integrals over Rectangle, Double Integrals. • Finding Area by double integrals, Double integrals in polar form • Finding Triple integrals in rectangular coordinates, Moments & centers of mass. Triple integrals in cylindrical & spherical coordinates. • Application Matrix: The unit matrix, types of matrix & matrix algebra. Reduction formula for evaluating the determination.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Partial Derivatives, the Chain Rule. Partial Derivatives (Total Derivative &Transformation, & Corresponds Equation). 8hrs • System of Homogeneous Equations. Extreme values & Saddle points. Partial Derivatives with constrained variables. 8 hrs

	• Double & Iterated Integrals over Rectangle, Double Integrals. 4 hrs • Area by double integrals, Double integrals in polar form. 4 hrs. • Triple integrals in rectangular coordinates, Moments & centers of mass. Triple integrals in cylindrical & spherical coordinates. 4 hrs • Matrix: The unit matrix, types of matrix & matrix algebra. Reduction formula for evaluating the determination. 8hrs • Line integrals and vector fields. 16 hrs •
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	We worked in to divide the students into groups to encourage student's participation in the exercises and discussion during solving the problems. Make a homwork concerning the subject of the lectures, and do seminars to present the work.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	59	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	66	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/ Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	5, 12	LO# 1-4
	Online Assignment	1	5% (5)	8	LO# 1-4
	Onsite Assignment	2	10% (10)	6, 13	LO# 1-5
	Seminars	1	5% (5)	11	LO# 5
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO# 1-3
	Final Exam	3 hr	50% (50)	16	All LOs
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Partial Derivatives, the Chain Rule
Week 2	Partial Equation Derivatives (Total Derivative &Transformation, & Corresponds n).
Week 3	System of Homogeneous Equations. Extreme values & Saddle points.
Week 4	Extreme values & Saddle points. Partial Derivatives with constrained variables
Week 5	Tangent plane and differentials. Taylor's formula for two variables
Week 6	Double & Iterated Integrals over Rectangle, Double Integrals.
Week 7	Area by double integrals, Double integrals in polar form.
Week 8	Triple integrals in rectangular coordinates, Moments & centers of mass. Triple integrals in cylindrical & spherical coordinates.
Week 9	Matrix: The unit matrix, types of matrix & matrix algebra. Reduction formula for evaluating the determination.
Week 10	Matrix: The unit matrix, types of matrix & matrix algebra. Reduction formula for evaluating the determination.
Week 11	Line integrals, vector fields and line integrals: work, circulation, and flux
Week 12	Greens theorems in plans
Week 13	Surface and area, surface integrals
Week 14	Stocks theorems, the divergence theorem and unified theory
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Thomas Calculus 12th Ed.	Yes
Recommended Texts	James Stewart Calculus 8th Ed.	Yes
Websites	-	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**

Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

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	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	THERMODYNAMICS II			**Module Delivery**	
Module Type	CORE			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	PGR223				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	UG2		**Semester of Delivery**	3	
Administering Department	PGR		**College**	PPE	
Module Leader	Mayson Anwar Abdullah		**e-mail**		
Module Leader's Acad. Title	Asst. lect.		**Module Leader's Qualification**	**PhD**	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	The module aims to provide students with a solid understanding of the principles and applications of thermodynamics, enabling them to apply these concepts to solve problems and analyze various systems and processes.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Understanding the relation of the changes in entropy to T and P for substances in the ideal-gas state. • Determining the Lost Work. • Understanding the Third Law of Thermodynamics and solve problems. • Understanding the Fundamental Property Relations, Residual Properties from the Virial Equations of State, and Generalized Property Correlations for Gases. • Understanding the fundamentals of Turbines (Expanders), and Compression Processes. • Understanding and solve problems on the Steam Power Plant. • Understanding and solve problems on the Carnot Refrigerator, the Vapor-Compression Cycle, Absorption Refrigeration, and the Heat Pump.		
Indicative Contents المحتويات الإرشادية	• Undergraduate review (4 hr). • the relation of the changes in entropy to T and P for substances in the ideal-gas state (4 hr). • Lost Work (4 hr). • The Third Law of Thermodynamics. (4 hr). • Fundamental Property Relations, Residual Properties from the Virial Equations of State, and Generalized Property Correlations for Gases. (8 hr). • Turbines (Expanders), Compression Processes, Throttling, and pumps (12 hr). • The Steam Power Plant (8 hr). • The Carnot Refrigerator, the Vapor-Compression Cycle, Absorption Refrigeration, and the Heat Pump (12 hr).		
Learning and Teaching Strategies استراتيجيات التعلم والتعليم			
Strategies	The main strategy that will be adopted in delivering this module is • encourage students' participation in the exercises, • refining and expanding their critical thinking skills. This will be achieved through classes and interactive tutorials. • by considering the type of simple experiments involving some		

	sampling activities that are interesting to the students. • Developing students' abilities in research by asking students to group discussion sessions • urging students to look at sources, books and the Internet as a source of information in addition to homework

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	73	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	4 , 11	
	Assignments	4	10% (10)	Continuous	
	Projects / Lab.	2	10% (10)	6, 13	
	Report		-	-	
Summative assessment	**Midterm Exam**	3 hr	10% (10)	7	
	Final Exam	3 hr	50% (50)	16	
Total assessment					

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The Second Law of Thermodynamics.
Week 2	The relation of the changes in entropy to T and P for substances in the ideal-gas state.
Week 3	The relation of the changes in entropy to T and P for substances in the ideal-gas state.

Week 4	Lost Work.
Week 5	Fundamental Property Relations, Residual Properties from the Virial Equations of State, and Generalized Property Correlations for Gases.
Week 6	Fundamental Property Relations, Residual Properties from the Virial Equations of State, and Generalized Property Correlations for Gases.
Week 7	Case study
Week 8	Applications of Thermodynamics to Flow Processes: Turbines (Expanders), Compression Processes, Throttling, and pumps.
Week 9	Applications of Thermodynamics to Flow Processes: Turbines (Expanders), Compression Processes, Throttling, and pumps.
Week 10	Production of Power from Heat.
Week 11	Production of Power from Heat.
Week 12	The Carnot Refrigerator, the Vapor-Compression Cycle, Absorption Refrigeration, and the Heat Pump.
Week 13	The Carnot Refrigerator, the Vapor-Compression Cycle, Absorption Refrigeration, and the Heat Pump.
Week 14	Case study.
Week 15	Case study.
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the**

		Library?
Required Texts	Introduction to Chemical Engineering Thermodynamics by J.M. Smith, Hendrick Van Ness, Michael Abbott, Mark Swihart, 7th Edition	yes
Recommended Texts	Fundamentals of Chemical Engineering Thermodynamics by Themis Matsoukas	No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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	Ministry of Higher Education and Scientific Research - Iraq University of Tikrit College of Petroleum Process Engineering Department of Petroleum and Gas Refining Engineering	

MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electrical			**Module Delivery**	
Module Type	Basic			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	PGR227				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	UGII		**Semester of Delivery**	2s	
Administering Department	PGR		**College**	PPE	
Module Leader	**Waladdin M. Shaher**		**e-mail**		
Module Leader's Acad. Title	Asst. Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor			**e-mail**		
Peer Reviewer Name	-		**e-mail**		
Review Committee Approval	-		**Version Number**	1.0	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	-

Co-requisites module	None	Semester	-

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To study the systems of units and understand the fundamental concepts of current, voltage, and resistance. 2. To learn about resistors, including color coding, Ohm's Law, power, efficiency, and energy calculations. 3. To analyze DC circuits, including series circuits, Kirchhoff's Voltage Law, and the relationships within series circuits. 4. To understand voltage laws, including the voltage divider rule and the behavior of voltage sources in series. 5. To study the internal resistance of voltage sources and voltage regulation. 6. To analyze parallel circuits and their characteristics. 7. To apply current laws, including Kirchhoff's Current Law and the current divider rule, and analyze voltage sources in parallel circuits. 8. To analyze series-parallel circuits and their behavior. 9. To study source conversions, ladder networks, methods of analysis, and the behavior of current sources in parallel and series. 10. To analyze circuits using mesh analysis, including determinants, the branch current method, and the general approach to mesh analysis. 11. To apply mesh and nodal analysis methods, including the format and general approaches. 12. To understand bridge networks and the conversion between delta and star configurations. 13. To study network theorems, including superposition and its application. To understand Thevenin's Theorem and Norton's Theorem, including their applications and the maximum power transfer theorem.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introduction: Systems of Units, Current, Voltage, Resistance Learn about the different systems of units used in electrical engineering. Understand the concepts of current, voltage, and resistance and their fundamental relationships. 2. Resistors: Color Coding, Ohm’s Law, Power, Efficiency, Energy Gain knowledge of resistor color coding and how to interpret resistor values. Understand Ohm's Law and its applications in electrical circuits. Learn about power calculations in resistive circuits and the concepts of efficiency and energy. 3. DC Circuits: D.C. Series Circuits, Kirchhoff’s Voltage Law, Series Circuits Relations. Study DC series circuits and analyze their behavior using Kirchhoff's Voltage Law. Understand the voltage and current relationships in series circuits. Learn how to calculate the total resistance, current, and voltage across each element in a series circuit. 4. Voltage Laws: Voltage Divider Rule, Voltage Sources in Series Learn the voltage divider rule and how to apply it in circuit analysis. Understand the behavior of voltage sources connected in series. Gain

knowledge of the voltage distribution across a series circuit with multiple voltage sources.

5. Voltage Source: Internal Resistance of Voltage Sources, Voltage Regulation Understand the concept of internal resistance in voltage sources and its impact on circuit performance. Learn about voltage regulation and methods to maintain a stable output voltage. Gain knowledge of voltage regulators and their applications.
6. Parallel Circuits: Parallel Circuits Analysis Study parallel circuits and analyze their behavior using Kirchhoff's Current Law. Understand the current and voltage relationships in parallel circuits. Learn how to calculate the total resistance, current, and voltage across each element in a parallel circuit.
7. Current Laws: Kirchhoff's Current Law, Current Divider Rule, Voltage Sources in Parallel, Open and Short Circuits Understand Kirchhoff's Current Law and its application in circuit analysis. Learn the current divider rule and how to apply it in parallel circuits. Study the behavior of voltage sources connected in parallel. Gain knowledge of open and short circuits and their effects on circuit behavior.
8. Series-Parallel: Series-Parallel Circuits Understand the analysis and behavior of series-parallel circuits. Learn how to simplify complex series-parallel circuits into equivalent circuits. Analyze the voltage and current relationships in series-parallel configurations.
9. Source Conversions: Ladder Network, Methods of Analysis, Current Sources, Source Conversions, Current Sources in Parallel, Current Sources in Series Gain knowledge of ladder networks and their analysis methods. Learn about different methods of circuit analysis, such as nodal and mesh analysis. Understand current sources and their behavior in parallel and series configurations. Study source conversions between current sources and voltage sources.
10. Mesh Analysis: Determinants, Branch Current Method, Mesh Analysis (General Approach) Understand the concept of mesh analysis and its applications in circuit analysis. Learn the branch current method and how to solve circuits using determinants. Gain proficiency in applying mesh analysis to solve complex circuits.
11. Mesh and Nodal Analysis: Mesh Analysis (Format Approach), Nodal Analysis (General Approach), Nodal Analysis (Format Approach)

Further explore mesh analysis, focusing on different approaches and techniques. Learn about nodal analysis and its general and format approaches.

Gain proficiency in applying nodal analysis to solve circuits.

12. Bridge Networks: Bridge Network, Delta to Star and Star to Delta Conversion
13. Understand the behavior and applications of bridge networks in circuit analysis.

4. Learn the concepts of delta-to-star

Indicative Contents المحتويات الإرشادية	1. Introduction: • Systems of Units: Introduction to different systems of units and their importance in electrical circuits. • Current, Voltage, Resistance: Understanding the fundamental concepts of current, voltage, and resistance and their relationship. 2. Resistors: • Color Coding: Learning how to interpret resistor color codes and determine their resistance values. • Ohm's Law: Understanding the relationship between current, voltage, and resistance. • Power, Efficiency, Energy: Exploring power calculations, efficiency, and energy consumption in resistor circuits. 3. DC Circuits: • D.C. Series Circuits: Analyzing series circuits and applying Kirchhoff's Voltage Law. • Series Circuits Relations: Understanding the relationships between voltage, current, and resistance in series circuits. 4. Voltage Laws: • Voltage Divider Rule: Learning how to calculate voltages in series circuits using the voltage divider rule. • Voltage Sources in Series: Analyzing circuits with multiple voltage sources connected in series. 5. Voltage Source: • Internal Resistance of Voltage Sources: Understanding the concept of internal resistance in voltage sources and its effect on circuit behavior. • Voltage Regulation: Exploring voltage regulation techniques and their importance in maintaining stable output voltages. 6. Parallel Circuits: • Parallel Circuits Analysis: Analyzing parallel circuits and calculating total resistance, current division, and voltage division. 7. Current Laws: • Kirchhoff's Current Law: Understanding Kirchhoff's Current Law and its application in circuit analysis. • Current Divider Rule: Learning how to calculate current division in parallel circuits. • Voltage Sources in Parallel: Analyzing circuits with multiple voltage sources connected in parallel. • Open and Short Circuits: Understanding the behavior of circuits in the presence of open and short circuit conditions. 8. Series-Parallel Circuits: • Series-Parallel Circuits: Analyzing circuits that contain both

series and parallel components.

9. Source Conversions:
    - Ladder Network: Understanding ladder networks and their analysis using source conversions.
    - Methods of Analysis: Exploring different methods of circuit analysis, including source conversions.
    - Current Sources: Understanding the behavior and analysis of circuits with current sources.
    - Source Conversions: Converting voltage sources to current sources and vice versa.
    - Current Sources in Parallel: Analyzing circuits with multiple current sources connected in parallel.
    - Current Sources in Series: Analyzing circuits with multiple current sources connected in series.
10. Mesh Analysis:
    - Determinants: Introduction to determinants and their application in mesh analysis.
    - Branch Current Method: Using the branch current method to analyze circuits and calculate mesh currents.
    - Mesh Analysis (General Approach): Applying the general approach to mesh analysis in complex circuits.
11. Mesh and Nodal Analysis:
    - Mesh Analysis (Format Approach): Using the format approach for mesh analysis in circuits with specific configurations.
    - Nodal Analysis (General Approach): Understanding the general approach to nodal analysis and its application in circuit analysis.
    - Nodal Analysis (Format Approach): Applying the format approach to nodal analysis in circuits with specific configurations.
12. Bridge Networks:
    - Bridge Network: Understanding bridge networks and their applications in circuit analysis.
    - Delta to Star and Star to Delta Conversion: Learning how to convert circuits between delta and star configurations for analysis purposes.
13. Superposition:
    - Network Theorems: Introduction to network theorems and their applications in circuit analysis.
    - Superposition: Applying the superposition theorem to analyze circuits with multiple sources.
14. Thevenin's Theorem, Norton's Theorem:
    - Norton's Theorem: Understanding Norton's Theorem and its application in circuit analysis.
    - Maximum Power Transfer Theorem: Exploring the concept of maximum power transfer and its significance in circuit design and efficiency.

	• Thevenin's Theorem: Applying Thevenin's

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	he learning and teaching strategies for this course will focus on a combination of theoretical knowledge and practical application. The course will employ a variety of teaching methods such as lectures, demonstrations, and hands-on exercises to ensure a comprehensive understanding of the topics. Students will be encouraged to actively participate in discussions, ask questions, and engage in problem-solving activities. The use of visual aids, simulations, and real-world examples will help illustrate the concepts and make them more relatable. Additionally, collaborative learning and group projects will be incorporated to promote teamwork and critical thinking skills. Regular assessments and feedback will be provided to monitor the progress of students and address any challenges they may encounter. The course will aim to create a supportive and interactive learning environment that fosters curiosity, encourages exploration, and equips students with the necessary knowledge and skills in electrical circuit analysis.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	55	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	4, 10	
	Online Assignments	2	10% (10)	5, 11	
	Onsite discussions	1	5% (5)	8	
	Report	1	5% (5)	13	
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Introduction:** Systems of Units, Current, Voltage, Resistance , **Resistors:** Color Coding, Ohm's Law, Power, Efficiency, Energy
Week 2	**DC Circuits:** D.C. Series Circuits, Kirchhoff's Voltage Law, Series Circuits Relations
Week 3	**Voltages laws:** Voltage Divider Rule, Voltage Sources in Series, **Voltage source**: Internal Resistance of Voltage Sources, Voltage Regulation
Week 4	**Parallel circuits:** Parallel Circuits analysis, Series-Parallel Circuits
Week 5	**Current laws:** Kirchhoff's Current Law, Current Divider Rule, Voltage Sources in Parallel, Open and Short Circuits
Week 6	**Source Conversions:** Ladder Network, Methods of Analysis, Current Sources, Source Conversions, Current Sources in Parallel, Current Sources in Series
Week 7	**Mesh Analysis:** Determinants, Branch Current Method, Mesh Analysis (General Approach)
Week 8	**Mesh and Nodal Analysis:** Mesh Analysis (Format Approach), Nodal Analysis (General Approach), Nodal Analysis (Format Approach)
Week 9	**Bridge Networks:** Bridge Network, Delta to Star and Star to Delta Conversion, **Superposition:** Network Theorems, Superposition
Week 10	**Thevenin's Theorem, Norton's Theorem:** Norton's Theorem, Maximum Power Transfer Theorem
Week 11	**Introduction:** Systems of Units, Current, Voltage, CAPACITORS , INDUCTORS ,COMPLEX NUMBER , CONJUGATE NUMBER , Efficiency, Energy ,
Week 12	**AC Circuits:** A.C. Series Circuits , Parallel Circuits analysis, Series-Parallel Circuits , **Voltages laws:** Voltage Divider Rule, Voltage Sources
Week 13	Kirchhoff's Current Law, Current Divider Rule AC Circuits , Voltage Sources in Parallel , Series AC Circuits
Week 14	**Mesh Analysis:** Determinants, Mesh Analysis AC Circuits , Nodal Analysis AC Circuits ,
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	/https://www.allaboutcircuits.com Robert L. Boylested, **Introduction circuit analysis 5th Ed.**, Columbus Merrill Pub. Co., 1982	نعم

	https://www.electrical4u.com/electrical-engineering-articles/circuit-theory/ https://www.electrical4u.com/electrical-engineering-articles/circuit-theory/	
Recommended Texts		كلا
Websites	https://www.allaboutcircuits.com/ -	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Properties of Petroleum Products**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐**Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**PGR225**				
ECTS Credits	6				
SWL (hr/sem)	**175**				
Module Level		**UGII**	**Semester of Delivery**		**4**
Administering Department		**PRG**	**College**	**PPE**	
Module Leader	**Ayoob Ibrahim Mohammed**		**e-mail**	**ayoob.i.mohammed@tu.edu.iq**	
Module Leader's Acad. Title		**Assistant professor**	**Module Leader's Qualification**		**MSc**
Module Tutor	**N/A**		**e-mail**	**N/A**	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	**1.0**	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	**PRG215**	**Semester**	**3**
Co-requisites module	**None**	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	5. **Introduction to quality assays of crude oil and its products** 6. **Quality assays of Gasoline product** 7. **Quality assays of kerosene product** 8. **Quality assays of jet fuel** 9. **Quality assays of diesel fuel** 10. **Quality assays of fuel oil and lubricating oils** 11. **Quality assays of bitumen** 12. **Water content by Karl Fischer method** 13. **Sulfur and nitrogen content** 14. **Conradson carbon residue CCR and ash content** 15. **Doctor test, color index, and total acid number TAN** 16. **Bottom sediment and water BS&W** 17. **Salt content and metal content** 18. **Asphalt and resin content**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	13. **Have knowledge about the sealable specifications of crude oil and its products.** 14. **Knowing the fundamentals of octane number, RVP, and copper strip corrosion tests.** 15. **Knowing the fundamentals of flash point, smoke point, and aniline point testers.** 16. **Recognize the standard specifications for jet fuel** 17. **Knowing the fundamentals of Cetane Number, Diesel index, and cold flow testers.** 18. **Knowing the fundamentals of bleeding test, heating value, and viscosity index .** 19. **Knowing the fundamentals of penetration point, ductility, softening point, solubility in TCE.** 20. **Knowing the fundamentals of Karl Fischer technique.** 21. **Knowing the fundamentals of ASTM D129, D1552, D2622, and ASTM D4629.** 22. **Knowing the fundamentals of ASTM D524 and D189.** 23. **Knowing the fundamentals of ASTM D664, ASTM UOP 41-07, ASTM D4952, ASTM D1500.** 24. **Knowing the fundamentals of ASTM D4007.** 25. **Knowing the fundamentals of ASTM D3230 and EPA 3040.** 26. **Knowing the fundamentals of IP 143 and ASTM D893.**
Indicative Contents المحتويات الإرشادية	**Part A: introduction to quality assays of petroleum products [10 hr.]. Part B: The fundamentals of the devices used in quality assays of petroleum products [30 hr.]. Part C: Thermophysical properties calculations [30 hr.]**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**The main strategy that will be adopted in delivering this module is to motivate students' participation in the class by raising questions and inquiries while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, symposiums, simple experiments that are interesting to the students, and self-assessment tests.**

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**70**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**5**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**102**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**7.28**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**2**	**20% (20)**	**5 and 10**	**#1 - #5, #6 - #10**
	Assignments	**2**	**8% (8)**	**4 and 13**	**#1- #4 and #8 - #13**
	Projects / Lab.	**4**	**8% (8)**	**Continuous**	**All**
	Seminar	**1**	**4% (4)**	**13**	**#5, and #6 - #14**
Summative assessment	**Midterm Exam**	**2hr**	**10% (10)**	**7**	**#1 - #7**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Introduction to quality assays of crude oil and its products**
Week 2	**Quality assays of Gasoline product**
Week 3	**Quality assays of kerosene product**
Week 4	**Quality assays of jet fuel**
Week 5	**Quality assays of diesel fuel**
Week 6	**Quality assays of fuel oil and lubricating oils**
Week 7	**Quality assays of bitumen**
Week 8	**Water content by Karl Fischer method**
Week 9	**Sulfur and nitrogen content**
Week 10	**Conradson carbon residue CCR and ash content**
Week 11	**Doctor test, color index, and total acid number TAN**
Week 12	**Bottom sediment and water BS&W**
Week 13	**Salt content and metal content**
Week 14	**Asphalt and resin content**
Week 15	**Preparatory week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Lab 1: Introduction to properties of petroleum products laboratory**
Week 2	**Lab 2: Determining RON and for gasoline MON, and RVP for gasoline**
Week 3	**Lab 3: Determining RVP and copper strip corrosion test for gasoline**
Week 4	**Lab 4: Determining flash point, smoke point, and aniline point for kerosene**
Week 5	**Lab 5: Determining Cetane Number, Diesel Index and viscosity of diesel fuel**
Week 6	**Lab 6: Determining cloud, pour, and freezing points of diesel fuel**
Week 7	**Lab 7: Bleeding test for lubricating oils**
Week 8	**Lab 8: Penetration and Softening points for bitumen**
Week 9	**Lab 9: Determining water content and salt content for crude oil**
Week 10	**Lab 10: CCR and metal content for crude oil**
Week 11	**Lab 11: Sulfur and Nitrogen content for diesel fuel**

Week 12	**Lab 12: Doctor test for kerosene and gasoline**
Week 13	**Lab 13: Asphaltene and resin content for crude oil**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Characterization of petroleum products by Riazi**	**Yes**
Recommended	**Handbook of Petroleum Refining Processes by Meyers**	**No**
Websites	**https://www.sciencedirect.com/book/9780444527851/fundamentals-of-petroleum-refining**	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq Tikrit University College of Petroleum Processes Engineering Department of Petroleum Control System Engineering	

MODULE DESCRIPTOR
وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	**ARABIC LANGUAGE اللغة العربية**		**Module Delivery**	
Module Type	BASIC		محاضرات نظرية	
Module Code	UOT011			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	1 2	**Semester (s) offered**	2	
Administering Department	PGR	**College**	PPE	
Module Leader	Nawal Salih Mahdi	**e-mail**	nawal.s.mahdi@tu.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer	**Module Leader's Qualification**	MSc	
Module Tutor	None	**e-mail**	None	
Peer Reviewer Name	None	**e-mail**	None	

Review Committee Approval		**Version Number**	2.0

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	لايوجد	**Semester**	-
Co-requisites module	لايوجد	**Semester**	-
Module Aims, Learning Outcomes, Indicative Contents and Brief Description أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر			
Module Aims أهداف المادة الدراسية	• **تخريج كوادر مؤهلة تأهيلاً كافياً في اللغة العربية وآدابها بالمستويات المختلفة، وفق فلسفة الجامعة ورسالتها.** • **الحفاظ على اللغة العربية، والإعلاء من شأنها، والحرص على استعمالها وتوظيفها توظيفاً صحيحاً في مناحي حياتنا المختلفة.** • **اكتشاف المواهب الأدبية وتنميتها لدى الطلبة، لتمكينهم من الإبداع في مجال اللغة العربية.** • **اتصال المتعلم بتراث أمته وحضارتها، لا سيما في مجال اللغة والأدب، واطلاعه على ما أنتجه الفكر العربي قديماً و حديثاً في هذا الإطار.** • **الإفادة من معطيات العلم والتكنولوجيا الحديثين في مجال تعلم اللغة واكتسابها.** • **نشر اللغة العربية والاعتزاز بها، في إطار الجمع بين الأصالة والمعاصرة.** • **تلبية احتياجات المجتمع المحلي والعربي والإقليمي من المتخصصين في اللغة العربية، للعمل في المجالات العلمية والتربوية والتعليمية والإعلامية والإدارية.** • **اكتساب الطلبة معارف والمعلومات المناسبة في اللغة العربية وآدابها ومهاراتها الأربع.** • **تنمية الذائقة اللغوية والأدبية لدى الطلبة، بما يمكنهم من الحكم الصحيح على ما يسمعون أو يقرؤون.**		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1. تزويد الطالب بثقافة عامة فضال عن دراستهم اللغوية** **2. ابعاد الطالب عن التحدث باللهجات المحلية.** **3. تزويد الطالب بمفردات علوم اللغة العربية** **4. متابعة قراءة الطالب على وفق القراءات السليمة.** **5. التعرف إلى مستويات نظام اللغة العربية.** 6. **ممارسة الكتابة والكلام باللغة العربية الفصيحة.**		
Indicative Contents المحتويات الإرشادية	**يتضمن المحتوى الارشادي مايأتي:** **1. ليس وأخواتها (2 ساعة)** **2. معاني حروف الجر (2 ساعة)** **3. سورة النبأ (2 ساعة)** **4. التصغير (2 ساعة)** **5. الشاعر امرؤ القيس (2 ساعة)** **6. فروق لغوية (2 ساعة)** **7. الوصل والفصل (2 ساعة)** **8. لا النافية للجنس (2 ساعة)** **9. الشاعر بدر شاكر السياب (2 ساعة)** **10. التمييز والحال (2 ساعة)** **11. جمع التكسير (2 ساعة)** **12. التاء المربوطة والمبسوطة (2 ساعة)** **13. الفرق بين الضاد والظاء (2 ساعة)**		

	14. **الخطابة (2 ساعة)**
Course Description	**إعداد كوادر تعليمية وبحثية متخصصة في اللغة العربية وآدابها، للإسهام في تلبية الحاجة المحلية والعربية والعالمية. يتطلع القسم الى اعداد جيل متمكن علميا وثقافيا مرتبطا بتراث الامة حريصا على الارتقاء باللغة نطقا وكتابة قادرا على تعزيز مكانتها بين لغات العالم المتحضر فاللغة آلة الفكر التي تؤمّن التعبير عنها وتطويره. ولما كان الفكر متجددا كان على اللغة كذلك ان تكون قادره على تنميها قدراتها والارتقاء بأدائها لتكون مؤهلة لنقل الافكار الجديدة وتطويرها. إجراء البحوث والدراسات الجادة خدمة للغة العربية والمعرفة الإنسانية. خدمة المجتمع المحلي فيما يتعلق باللغة العربية وآدابها من خلال النشاطات، والمحاضرات، والندوات، والمؤتمرات التي يعقدها القسم، أو يشارك فيها.**
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	تقوية ملكة الابداع لدى دارسي اللغة العربية فلا يقتصر استخدامها على الاغراض الحياتية العامة بل يتعداه الى تنشئة اجيال من المبدعين في المجالات اللغوية والادبية كافه يحاكي ما لدى الامم المتحضرة من ابداع.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	31	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	19	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time (hr)	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	20% (20)	3, 5, ,7, 9,11,13,	LO #1, 2,3,....., 11
	Assignments (Homeworks)	6	15% (15)	2, 4, 6, 10,12,14	LO # 1, 2, 3, ...,11
	Reports	7	5% (5)	3, 5, ,7, 9,11,13,	
Summative assessment	**Midterm Exam**	2	10% (10)	8	LO # 1-7
	Final Exam	3	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**ليس وأخواتها**
Week 2	**معاني حروف الجر**
Week 3	**سورة النبأ**
Week 4	**التصغير**
Week 5	**الشاعر امرؤ القيس**
Week 6	**فروق لغوية**
Week 7	**الوصل والفصل**
Week 8	**لا النافية للجنس**
Week 9	**الشاعر بدر شاكر السياب**
Week 10	**التمييز والحال**
Week 11	**جمع التكسير**
Week 12	**التاء المربوطة والمبسوطة**
Week 13	**الفرق بين الضاد والظاء**
Week 14	**الخطابة**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	القران الكريم • شرح ابن عقيل • الصرف الواضح ومصادر اللغة و الأدب القديم والحديث و البلاغة العربية و النحو العربي و الصرف و الاملاء.	Yes
Recommended Texts	أوضح المسالك إلى ألفية ابن مالك، والصرف العربي أحكام ومعان، ومجلة الدراسات اللغوية والأدبية	No
Websites	N/A	

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success	**A -** Excellent	امتياز	90 – 100	Outstanding Performance

Group (50 - 100)	**B -** Very Good	جيد جدا	80 – 89	Above average with some errors
	C - Good	جيد	70 – 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 – 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.