	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Thermodynamics **1**			**Module Delivery**	
Module Type	C			☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MPAC108				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	1		**Semester of Delivery**	**2**	
Administering Department	Refrigeration and Air Conditioning Techniques		**College**	Engineering	
Module Leader	Audai Hussein		**e-mail**	audai.hussein@uowa.edu.iq	
Module Leader's Acad. Title	Professor Doctor		**Module Leader's Qualification**	PHD	
Module Tutor	Zainab Abdul Karim Salem		**e-mail**	zainab.abdelkarim@uowa.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	15 /10/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NA	**Semester**	
Co-requisites module	NA	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Studying the principles of thermodynamics including, thermal systems according to energy interactions with their direct surroundings, the differences in the properties of both the system and the surrounding with their engineering applications
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To know the basic properties of material with units 2. To know the laws of thermodynamics 3. To know the phases of substance 4. To know the basic thermodynamic cycles 5. To know the entropy 6. To know the basics on combustion
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Laws of thermodynamics First and second law of thermodynamics. [24 hrs.] Part B – P-V diagram P-v diagram of water and different gases. Phases of the water and substances. [16 hrs.] Part C – Thermal cycle Carnot cycle, vapor cycle, steam cycle, gas cycle, Otto cycle, Diesel cycle, duel cycle, and duel cycle. [58 hrs.] Part D – Combustion Combustion, combustion and equilibrium equations [24 hrs.]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignment, written exams, case study, quizzes, seminars and practical testing.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	144	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	10
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	56	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	10
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	5	5 % (5)	2,5,8,10,13	LO # 1, 4, 5, 7,8
	Assignments	5	5 % (5)	1,4,7,11,15	LO # 1-15
	Lab.	10	10 % (10)	1-9	LO # 1-15
	Report	10	10 % (10)	1-8	LO # 1-15
Summative assessment	**Midterm Exam**	3 hr.	20 % (20)	9	LO # 1-15
	Final Exam	3 hr.	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introductions, references, units, pressure, force, work, Temperature, unit of temperature and conversion, temperature measurements. Zeorith law of Thermodynamics. Energy, types of energy, positional, kinetic, internal and flow energy energies. Heat and work, power, enthalpy.
Week 2	First law of thermodynamics, Steady flow energy equation for open system, non-flow energy equation Transient state,

Week 3	Ideal gas, Boyle's law and Charles law and equation of state, Specific heat at constant pressure and constant volume, Closed system processes using ideal gas. Isometric and isobaric processes
Week 4	Isothermal and adiabatic processes, Polytropic processes, Control volume processes
Week 5	Vapour, phase of substance, Phase change curve on P-V diagram. Dryness fraction, liquid and vapour lines, wet vapour
Week 6	Steam tables and Examples on steam tables, Super-heated vapour, tables of super-heated tables
Week 7	Processes using two phase system, processes on P-V diagram, Irreversible processes Closed system, Second law of thermodynamics, heat engine, heat pump
Week 8	Carnot cycle and reversed Carnot cycle. Irreversible and reversible processes
Week 9	Clausius in equality for second law, Entropy on T-S and entropy calculations.
Week 10	Entropy for vapour, Entropy for system and surroundings, Isentropic efficiency
Week 11	Air standard cycle, Otto cycle. Diesel and Dual cycles
Week 12	Steam power plants- Rankin Cycle, Rankin Cycle with superheated. Modified Rankin Cycle
Week 13	Modification on Carnot to use as vapour compression cycle. Vapour compression cycle,
Week 14	Combustion, combustion equations, equilibrium of combustion equation. Volumetric analysis on combustion process
Week 15	Final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Measurement and instruments
Week 2	Types of temperature measurements
Week 3	Measuring the velocity of air
Week 4	Calibration of thermocouple
Week 5	Joule experiment
Week 6	Boyle Experiment
Week 7	Measuring of C.V of fuel
Week 8	Measuring specific heats
Week 9	Finding the law of expansion
Week 10	Measuring the latent heat of evaporation
Week 11	Heat pump
Week 12	finding of the degree of superheating

Week 13	Performance of simple compression cycle
Week 14	Actual vapour compression cycle
Week 15	Final exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Borgnakke, C. and Sonntag, R.E., 2022. *Fundamentals of thermodynamics*. John Wiley & Sons. Cengel, Y.A., Boles, M.A. and Kanoğlu, M., 2011. *Thermodynamics: an engineering approach*. New York: McGraw-hill. Rajput, R.K., 2005. *A textbook of engineering thermodynamics*. Laxmi Publications.	Yes

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 Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Computer principles			**Module Delivery**	
Module Type	E			☐ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	MPAC111				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Refrigeration and Air Conditioning Techniques		**College**	**Engineering**	
Module Leader	**Saja Abdul Hamza Yas**		**E-mail**	saja.abdulhamza@uowa.edu.iq	
Module Leader's Acad. Title	**Assistant lecturer**		**Module Leader's Qualification**	**M.Sc**	
Module Tutor			E-mail		
Peer Reviewer Name			E-mail		
Scientific Committee Approval Date	15-10-2024		Name (if available)	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	الهدف العام : اكساب الطالب مهارات التعامل مع التطبيقات المكتبية الاساسية وانشاء الملفات والمستندات المكتبية واستخدام نظم التشغيل فضلا عن اساسيات العمل مع البيئة الرقمية.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	أ- المعرفة والفهم • 1- من خلال إلقاء المحاضرات النظرية الصفية وحث الطلبة على قراءة كتاب معين في المادة، إضافة إلى تكليف الطلبة بواجبات بحثية و/أو تقارير مكتبية وذلك في مستوى السنة الأولى من الدراسة.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	محاضرات مكتوبة

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	15	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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				
	Assignments				
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam				
	Final Exam				
Total assessment					

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

weeks	Material Covered
1	اساسيات الحاسوب ومفهوم الحاسوب مجالات استخدام الحاسوب ومميزاته وتصنيفه من حيث الحجم والغرض من الاستخدام ونوع البيانات.
2	مكونات الحاسوب المادية والكيان البرمجي للحاسوب مكونات سط المكتب وقائمة ابدا وشريط المهام المجلدات والملفات والايقونات اجراء العمليات على النوافذ وخلفيات سطح المكتب
3	الحاسوب الشخصي ومفهوم امن البرامج وتراخيص البرامج اخلاق العالم الالكتروني وامن الحاسوب وخصوصيته تراخُص برامج الحاسوب وانواعها، الملكية الفكرية، الاختراق الإلكتروني، برمجيات خبيثة اهم الخطوات اللازمة للحمايّة من عمليّات الاختراق، اضرار الحاسوب على الصحة
4	التحكم في نظام التشغيل ومكوناتها ومجموعاتها حذف البرامج وتنصيبها
5	بعض الحالات والاعدادات الشائعة في الحاسوب ,ادارة الطابعة وضبط الوقت والتاريخ , صيانة الاقراص الاولية.
6	مايكروسوفت 2010 تشغيل برنامج مايكروسوفت 2010 واجهة البرنامج التبويبات الرئيسية
7	تبويب home تبويب عرض تبويب تخطيط الصفحة
8	ادراج الكائنات والجدول مجموعة نص ورموز

	الكائنات الاضافية في وورد
9	برنامج بوربوينت 2010 فتح البرنامج بيئة البرنامج اضافة وتحرير الشرائح
10	الاضافات على الشرائح وحركاتها الاضافات والادراج والتعاليق
11	برنامج اكسل 2010 بيئة البرنامج وفتحه واغلاقه التعرف على التبويبات
12	التعامل مع الجداول والدوال المعادلات ادخال المنحنيات والمضلعات واضافتها
13	ملخص لبرنامج بينت paint كمثال على معالجة الصور لنسخ والاضافة والنقل بين البرامج المختلفة للحاسوب
14	مراجعة
15	امتحان نهاية الفصل للمادة النظرية

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي العملي

weeks	Material Covered
1	تدريب الطالب على التعامل مع بيئة الحاسوب والديسك توب و تصفح وفتح واغلاق النوافذ ومربعات الحوار والطرّق الصحيحة للتعامل مع لوحه المفاتيح والمؤشر والأجهزة الأخرى. -امثله عملّة حول التخصّيص والتعامل مع الإيقونات وتغّيير دقة الشاشة.
2	تدريب الطالب على قائمة ابدا وتكوّن ملف وخزنه باسم الطالب على سطح المكتب .التعامل من النوافذ للبرنامج واشرطة التمرّير. -انشاء مجلد باسم معّين والتدرّيب حول تغّيير الاسم والاخفاء والاسترجاع والحذف تدرّب الطالب على اجراء عملّات على النوافذ خلفّات سطح المكتب.
3	تدرّيب الطالب على التعامل مع تراخّيص برامج الحاسوب وانواعها والتعامل مع المنشأ الأصلي للبرامج . تدرّب الطالب على التعامل مع امن الحاسوب والاختراق الالكتروني

4	التعرف على نظم التشغيل تهيئة القرص الصلب وتنصيب نظام التشغيل وندوز
5	تدرّب الطالب على استخدام لوحة التحكم و الاعدادات الشائعة في الحاسوب و تنصّب الطابعة وكيفية التعامل معها , ضبط الوقت والتاريخ
6	التعرف على بيئة برنامج وورد وقوائمه وتنسيقاته كتابة نصوص كثيرة وتدريب الطالب عليها بأنواع التنسيقات وسحبها على الطابعة.
7	تدريب الطالب على تخطيط الصفحة وباقي التبويبات واضافة الرموز والمعادلات
8	التدريب على ادراج الكائنات عمل الجداول وامثلة متنوعة عليها عمل المستندات باحترافية اكثر
9	برنامج بور بوينت التدريب والتعرف على بيئة البرنامج والشرائح وتبوبياته وتنسيقاته واضافتها وحذفها
10	عمل شرائح متعددة والتدريب على حركة الشرائح والاصوات و ادراج الكائنات
11	التعرف على بيئة برنامج اكسل وقوائمه وتنسيقاته تدريب الطالب على أنواع التنسيقات والتبويبات
12	التحكم بالجداول ورسم المنحنيات والمضلعات
13	برنامج مايكروسوفت بينت كمثال على برامج معالجة الصور التدريب على ربط البرامج ببعضها والتحكم بذلك
14	مراجعة
15	امتحان نهاية الفصل للمادة العملية

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		yes
Recommended Texts		no
Websites		

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

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

	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Drawing			**Module Delivery**	
Module Type	C			☐ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	MPAC101				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	1	
Administering Department	BSc-MPAC		**College**	Engineering	
Module Leader	Salma Mahmoud Mazhar		**e-mail**	Salma.mahmood@uowa.edu.iq	
Module Leader's Acad. Title	Asst.Lect.		**Module Leader's Qualification**	M.S.C	
Module Tutor	Sarah Hashem Mohammed Hashem		**e-mail**	sarah.ha@uowa.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	15/10/2024		**Version Number**	1	

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. This module describes the skills, knowledge, and attitude required to apply technical drawing. At the end of this module, learners will be able to Introduce technical drawings, apply principles of drawing, and project views. 2. to make the students know how to draw (Engineering Drawing) by using AUTOCAD program. 3. This course deals with the basic concept of Engineering Drawing. 4. Define the Engineering Drawing - The Tools used in Engineering Drawing - Types of drawing sheets, types of lines. 5. Learning 2D interface in AutoCAD. 6. Learning 3D interface in AutoCAD.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Define the Engineering Drawing - The Tools used in Engineering Drawing - Types of drawing sheets, types of lines 2-Introduction to AutoCAD and learning how to use the program interface 3-Learning how to use Draw toolbar and its content 4-Learning how to use modify toolbar and its content 5-Learning how to use dimension toolbar and its content and draw 2D exercises 6-Theory of projection, Theory of projection 1st angle 7-Theory of projection 3rd angle 7-Drawing the three projection views 8-Theory of Section and Drawing the three Section views 9-Learning 3D interface in AutoCAD and 3D tools, 3D exercises		
Indicative Contents المحتويات الإرشادية	indicative contents include the following: <u>Part A:</u> The Purpose of Engineering Drawings An engineering drawing is a subcategory of technical drawings. The purpose is to convey all the information necessary for manufacturing a product or a part.		

	Engineering drawings use standardized language and symbols. This makes understanding the drawings simple with little to no personal interpretation possibilities. Part B: understanding AutoCAD AutoCAD interface and Its usage like centers around drawing with electronic equivalents of real-life drafting tools. The added support of digital precision helps with measurements and calculations, 3D components, and data sharing. Part C: 2D Drawings Using lines to make 2D drawings, apply dimensions rules, design 2d shapes and drawing projections and sectioning views. Part D: 3D drawings 3D CAD, or three-dimensional computer-aided design, is technology for design and technical documentation, which replaces manual drafting with an automated process.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to courage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. YouTube channel for the teacher includes lessons to help the students in their studying https://www.youtube.com/channel/UCiUmlY4CLQn5ycY4von1P5g

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	88	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
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	10% (10)	5,10	LO #1,2,10 and 11
	Assignments	2	10% (10)	2,12	LO #3,4,6 and 7
	Projects / Lab.	1	10% (10)	continuous	
	Report	1	10% (10)	13	LO # 5,8 and 10
Summative assessment	**Midterm Exam**	3	10% (10)	7	LO # 1-7
	Final Exam	3	50% (50)	16	All
Total assessment			100% (100 marks)		

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Define the Engineering Drawing, tools, types of drawing sheets, and types of lines
Week 2	Introduction to AutoCAD and learning how to use the program interface
Week 3	Learning how to use Draw toolbar and its content
Week 4	Learning how to use Draw toolbar and its content
Week 5	Learning how to use modify toolbar and its content
Week 6	Learning how to use dimension toolbar and its content and draw 2D exercises
Week 7	Theory of projection, Theory of projection 1st angle
Week 8	Find the 3rd project view from 2 views
Week 9	Theory of projection 3rd angle
Week 10	Drawing the three projection views
Week 11	Theory of Section
Week 12	Drawing the three Section views
Week 13	Learning 3D interface in AutoCAD
Week 14	3D tools, 3D exercises
Week 15	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	ملزمة الرسم الهندسي الخاصه بالكلية التقنية الهندسية بغداد/ قسم هندسة تقنيات المواد	Yes
Recommended Texts	K. Venkata Reddy "Textbook of Engineering Drawing second edition" 2008	No
Websites	https://www.autodesk.com/	

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
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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 Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Arabic			**Module Delivery**	
Module Type	B			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	MPAC110				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Air and Refrigeration conditioning technologies		**College**	Engineering	
Module Leader	Aseel Ghazi Ibrahim		**e-mail**	Aseelaljanabi2020@gmail.com	
Module Leader's Acad. Title	Assist Lecturer		**Module Leader's Qualification**	M.sc	
Module Tutor	NA		**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	15 / 10/2024		**Version Number**	1.0	
Relation with other Modules					

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NA	**Semester**	
Co-requisites module	NA	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1- تعميق معرفة الطالب بقواعد اللغة والإملاء التي تعلمها سابقا؛ ليتحاشى الوقوع في الأخطاء اللغويّة والاملائية، وليسهل عليه كتابة التقارير وجميع الأعمال الكتابية بصورة صحيحة نحويًا ولغويًا. 2- توسيع نطاق الوعي اللغويّ والأدبيّ ليشمل جميع الطلبة والمجتمع المحلي من خلال المحاضرات والندوات والدورات التدريبية المختلفة، والاحتفاء بالمبدعين مِن أصحاب المواهب.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	المعرفة والفهم والتطبيق من خلال إلقاء المحاضرات النظرية الصفية وحث الطلبة على قراءة كتاب معين في المادة، إضافة إلى تكليف الطلبة بواجبات بحثيّة، أو تقارير مكتبيّة وذلك في مستوى السنة الأولى من الدراسة.
Indicative Contents المحتويات الإرشادية	يتكون المقرر من جزء واحد يتناول تعليم الطلبة القواعد العامة للكتابة باللغة العربية بما يضمن عدم الإخلال بأساسيات هذه اللغة.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	التعلم الذاتي ـ التعلم النشط ـ التعلم التعاوني، عرض المادة ـ طرح الأسئلة ـ اختبارات صفيّة ـ واجب بيتي.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2

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%	1 ,2 ,3 , 4	تطبيق ما تعلمه الطالب من قواعد في الأعمال الكتابية وتنمية المعرفة اللغويّة لديه من خلال تمكين مهارات الإملاء، واستخدام الكلمة المناسبة في موضعها المناسب.
	Assignments	2	10%	5 , 11	
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam	2hr	20%	7	
	Final Exam	3hr	50%	15	
Total assessment			100%		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	- مفهوم الأخطاء اللغويّة - قواعد كتابة التاء المربوطة والتاء المفتوحة
Week 2	- الألف الممدودة والمقصورة - الحروف الشمسيّة والقمريّة
Week 3	الطاء والظاء
Week 4	كتابة الهمزة: - همزة الوصل والقطع - الهمزة المتوسطة - الهمزة المتطرفة
Week 5	علامات الترقيم
Week 6	الاسم والفعل والتفريق بينهما
Week 7	المفاعيل: - المفعول به

	- المفعول المطلق - المفعول لأجله - المفعول فيه - المفعول معه
Week 8	العدد
Week 9	تطبيقات الأخطاء اللغويّة الشائعة
Week 10	تطبيقات الأخطاء اللغويّة الشائعة
Week 11	- معاني حروف الجر - قاعدة الألف الفارقة - قاعدة النون والتنوين
Week 12	الجوانب الشكلية للخطاب الإداري
Week 13	لغة الخطاب الإداري
Week 14	لغة الخطاب الإداري
Week 15	امتحان

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	١. كتاب الإملاء المفيد: نعوم جرجيس زرازير، نقحه: د. مصطفى جواد – مطابع النعمان النجف الاشرف – ط6- 1973م. ٢. كتاب الإملاء للمرحلة المتوسطة: عبد الجبار عبد الله الألوسي واخرون – وزارة التربية المديرية العامة للمناهج – ط18 – 2014م. ٣. دروس في اللغة والنحو والإملاء لموظفي الدولة: إسماعيل حمود عطوان واخرون – مطبعة وزارة التربية (3) بغداد – ط2 – 1984م. ٤. اللغة العربية العامة لأقسام غير الاختصاص: عبد القادر حسن امين واخرون – وزارة التعليم العالي والبحث العلمي – ط2 – 2000م.	نعم
Recommended Texts		
Websites		

Grading Scheme
مخطط الدرجات

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

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	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Workshops			**Module Delivery**	
Module Type	C			☐ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	MPAC102				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	1		**Semester of Delivery**	1	
Administering Department	**BSc-MPAC**		**College**	**Engineering**	
Module Leader	Hussein Salem		**e-mail**	ali.basem@uowa.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	PhD	
Module Tutor	Name (if available)		**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	15/10/2024		**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 main object of this unit is to identify the students on the gain of the manual skills by preceding the operations and manufacturing processes, and doing the maintenance by using different manual tools and measuring instruments
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the engineering mechanics module, students should be able to: preceding the operations and manufacturing processes, and doing the maintenance by using different manual tools and measuring instruments
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Foundry workshop: 2. Casting of metals and their importance - Purpose of using castings in industry - Contents of the foundry unit - Industrial safety reserves in the foundry - Forming a sand mold for a one-piece model - Sands of molds and hearts: types, sources and properties - Additives, mixing processes and adjusting ingredients - Use of sand mixer - Handling of improvised sand - Sand handling devices - forming sand molds by manual method for a one-piece model - forming a sand mold. 3. Sand mold for a one-piece model with defining the estuaries and elevators - Metal smelting and pouring into the mold - Extracting and cleaning the castings - Forming a mold using the pulp box and drying it in the drying oven - Forming a sand mold for a simple two-piece model with a dog. 4. Forming a sandy mold like the previous one with melting the metal and pouring it into a mold and taking out the casting and cleaning it - Metal melting furnaces: types, qualities, uses (rotary kiln, stirrers and stationary) - Reviewing and examining the castings - Determining the apparent defects and their causes - Reviewing the dimensions of the castings and ensuring that they conform to the required dimensions. 5. Furnaces: types, methods of measurement, how a Vernier works to read altimeters with depths - the process of marking (shenk) - base surfaces - the number used - backing materials - marking thorns - just vertebrae - mens of guilt and guilt notation - right angle - pointing flowers - scale heights and depths 6. Files and the cold process: types and specifications of files - mechanized and their types - methods of attaching artifacts to them - uses of files - the method of cleaning the initiator - the cold process - an exercise on the process of marking and simple filings. 7. Saw cutting: hand saw, saw weapon, saw weapon installation, conditions to be met in the sawing process - an exercise on the sawing process. 8. Lathe: specifications, use, accessories and installation methods - forming the lathe - types of lathe pens and the use of measuring tools. 9. Turning operations: flat turning, straightening, simple graded work with the use of measuring tools. 10. Lathe the internal and external loot in different ways with an explanation of the laws of each method - doing an exercise for the external loot and another for the internal loot. 11. Welding workshop:

	12. Occupational safety and security needs - gas welding - equipment used and how to install and control it - other auxiliary tools - used gases and their specifications - welding safety, types and measurements - other auxiliary materials - welding equipment - types of flames, method of ignition and control of the required flame - works - rinsing and cleaning the basins to be welded. 13. Practical exercises for welding opposite surfaces, perpendicular surfaces, inclined surfaces and circuit welding, longitudinal and transverse cutting - cutting: circle, irregular shapes - electric arc welding - equipment used. 14. Welding equipment - Practical training on the use of electric arc welding of different surfaces - Point and tape welding - Equipment used in each type - Types of electrodes and their installation method - Practical training on the use of each type. 15. Welding using argon gas - doing welding exercises using argon gas. 16. Gas cutting operations - equipment used - precautions to be provided. 17. Assembly exercises using various different cutting and welding equipment.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, and hand-in assignments while at the same time refining and expanding their critical thinking skills through the written exam, Case studies, Quizzes, seminars, Practical testing, and Online testing. and this will be achieved through classes and interactive tutorials.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	116	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	124	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	240		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	6	40% (40)	3,6,9,12	LO #1,2,…..10
	Report/Lab	14	60% (60)	All	LO # 8
	Seminar				
Summative assessment	**Midterm Exam**				
	Final Exam				

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي العملي

	Material Covered
Week 1	Casting of metals and their importance - Purpose of using castings in industry - Contents of the foundry unit - Industrial safety reserves in the foundry - Forming a sand mold for a one-piece model - Sands of molds and hearts: types, sources and properties - Additives, mixing processes and adjusting ingredients - Use of sand mixer - Handling of improvised sand - Sand handling devices - forming sand molds by manual method for a one-piece model - forming a sand mold.
Week 2	Sand mold for a one-piece model with defining the estuaries and elevators - Metal smelting and pouring into the mold - Extracting and cleaning the castings - Forming a mold using the pulp box and drying it in the drying oven - Forming a sand mold for a simple two-piece model with a dog.
Week 3	Forming a sandy mold like the previous one with melting the metal and pouring it into a mold and taking out the casting and cleaning it - Metal melting furnaces: types, qualities, uses (rotary kiln, stirrers and stationary) - Reviewing and examining the castings - Determining the apparent defects and their causes - Reviewing the dimensions of the castings and ensuring that they conform to the required dimensions.
Week 4	Files and the cold process: types and specifications of files - mechanized and their types - methods of attaching artifacts to them - uses of files - the method of cleaning the initiator - the cold process - an exercise on the process of marking and simple filings.
Week 5	Saw cutting: hand saw, saw weapon, saw weapon installation, conditions to be met in the sawing process - an exercise on the sawing process.
Week 6	Lathe: specifications, use, accessories and installation methods - forming the lathe - types of lathe pens and the use of measuring tools.
Week 7	Turning operations: flat turning, straightening, simple graded work with the use of measuring tools.
Week 8	Lathe the internal and external loot in different ways with an explanation of the laws of each method - doing an exercise for the external loot and another for the internal loot.
Week 9	Occupational safety and security needs - gas welding - equipment used and how to install and control it - other auxiliary tools - used gases and their specifications - welding safety, types and measurements - other auxiliary materials - welding equipment - types of flames, method of ignition and control of the required flame - works - rinsing and cleaning the basins to be welded.
Week 10	Practical exercises for welding opposite surfaces, perpendicular surfaces, inclined surfaces and circuit welding, longitudinal and transverse cutting - cutting: circle, irregular shapes - electric arc welding - equipment used.
Week 11	Welding equipment - Practical training on the use of electric arc welding of different surfaces - Point and tape welding - Equipment used in each type - Types of electrodes and their installation method - Practical training on the use of each type.
Week 12	Welding using argon gas - doing welding exercises using argon gas.
Week 13	Gas cutting operations - equipment used - precautions to be provided.

Week 14	Assembly exercises using various different cutting and welding equipment.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts		
Websites		

Grading Scheme
مخطط الدرجات

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

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

	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Materials			Module Delivery	
Module Type	C			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MPAC103				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		Semester of Delivery	1	
Administering Department	BSc-MPAC		College	Engineering	
Module Leader	Hussein S. Ketan		e-mail	hussein.kt@uowa.edu.iq	
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D	
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date	15 / 10/2024		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. Explain the atomic structure and types of primary and secondary atomic and molecular bonding. 2. Explain the crystal structures and geometry and classify different classes of space lattices in crystalline solids. 3. Perform different types of mechanical testing for evaluation of mechanical properties of material. 4. Extract information of materials behavior from phase diagram. 5. Identify the structures, properties and applications of the main engineering materials (metals, alloys, polymers, ceramics and composites. 6. Explain corrosion mechanisms and types of corrosions and methods of corrosion prevention. 7. Explain the Nano materials.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student able to: 1. Mechanical Properties, stress-strain curve, elasticity, plasticity, ductility, young modulus, tensile stress, yield stress, bricking stress, true and engineering stress-strain diagram). 2. Knowledge of Ionic bond, inter-atomic distance attraction forces between atoms, coordination number, covalent bond, and Metallic bond. 3. Knowledge the Crystal structure, unit cell, types of unit cells simple cubic, Face centered cubic, body centered cubic, atomic packing factor, Previous lattice, Miller index, . 4. To Understanding the Phase diagrams 5. To know the types of Engineering Materials 6. To know Corrosion, Definition, why it happens, Type of corrosion, Dry and wet corrosion. Eight Form of corrosion. Mechanism of crevice corrosion 7. To know Methods of prevention and protection.		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: 1-Crystalline and non Crystalline Materials, Metallic crystal structures crystallographic directions ,crystallographic planes-Types of crystal structure, Packing factor.Bonds ,metallic bond ,ionic bonds ,covalent bond ,vander waals bond , hydrogen bond (12 hr) - Defects ,point defects ,dislocations ,linear defects ,planar defects (3hr)		

	-Mechanical properties ,Hardness (Brinell hardness ,Vickers hardness , Rockwell hardness) Tensile test, Impact test, Creep test, Fatigue test. (15 hr) -Ferrous and nonferrous alloys in air conditioning and refrigeration equipment's Copper alloys , Aluminum alloys (3hr) -Solidi faction. Solid solution - Phase –diagrams for binary alloys, Complete solubility in both liquid and solid state, Complete solubility in liquid state and complete insolubility in solid state, Complete solubility in liquid state and limited solubility in solid state, Iron –carbon systems , Types of iron- carbon systems (12 hr) - Corrosion and corrosion prevention(3hr) -Applications of Nano materials, types ,manufactures of Nano materials.(3hr)

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, written exam, Quizzes, reports, seminars, Practical testing and Online testing.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	90	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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	4	10% (10)	3,6, 9,12	
	Assignments	2	10% (10)	6, 12	
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	14	
Summative assessment	Midterm Exam	2 hr	10% (10)	7	
	Final Exam	2hr	50% (50)	15	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to engineering material science and needs of engineering materials study
Week 2	Classification of materials
Week 3	Ionic bond, inter-atomic distance attraction forces between atoms, coordination number, covalent bond, and Metallic bond.
Week 4	Crystal structure system ,examples and diagrams with definitions
Week 5	Previous lattice, packing factor
Week 6	Definition of alloys, binary alloys, phase diagrams (equilibrium thermal diagrams), eutectic; solid solution
Week 7	solid solution and combination type diagram, Iron-carbon face diagram
Week 8	Iron-carbon cooling curve, phases, reactions, and multi phases
Week 9	Types of thermal equilibrium diagrams
Week 10	Mechanical test and some types
Week 11	Corrosion and types of corrosion
Week 12	Composite material
Week 13	Powder methodology
Week 14	Nano materials
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- William D. Callister, Jr.and David G. Rethwisch, Materials Science and EngineeringAn Introduction, 2007 John Wiley & Sons, Inc. 2- Jones, D.A., “Principal and Protection of Corrosion”, PrenticeHall	Yes
Recommended Texts	1-W. Bolton, R. A. Higgins. Materials for Engineers and Technicians, 2014.	no

	2-Mechanical Properties of Materials, David Roylance 2008. 3-Williiam Bolton, Engineering Materials,2014	
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
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	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Mechanics			**Module Delivery**	
Module Type	C			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	MPAC107				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	1		**Semester of Delivery**	2	
Administering Department	BSc-MPAC		**College**	Engineering	
Module Leader	Riyam Abd-Alrazaq Salman		**e-mail**	riyariyam.a@uowa.edu.iq	
Module Leader's Acad. Title	Ass. Lecturer		**Module Leader's Qualification**	M.Sc	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	15 / 10/2024		**Version Number**	1	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MPAC100	**Semester**	L1,S1
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The course aims to provide first-stage students with basic knowledge of engineering mechanics. 2. Everything related to forces and motion and related concepts such as equilibrium and analysis of forces, centers of gravity, moments of inertia, friction and motion of bodies are studied. 3. The course aims to enable students to gain access to the science of geometry by understanding how to perform correct engineering analysis 4. Dealing with laws, equations, illustrations, and other data, and linking data together to reach outputs. 5. Enabling the student to be able to analyze, devise and draw conclusions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The student can understand the fundamentals and laws of engineering mechanics. 2. The student is familiar with the types of forces and methods of analysis. 3. The student can understand the basics of the Equilibrium of a Particle 4. Understand the Moment of a Force around the point and axis. 5. Learn the basics of Equilibrium of a Rigid Body and equations of equilibrium. 6. The student can understand Structural Analysis. 7. Enabling students to obtain knowledge, understanding, and analyze the motion of mechanical systems. 8. Learn concepts of motion laws. 9. Learn and analyze the motion of projectiles. 10. Absolute Dependent Motion Analysis of Two Particles. 11. The Students can understand the Kinetics of a Particle: Force and Acceleration. 12. The Students can understand the Kinetics of a Particle: Work and Energy.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** 1. The fundamentals and laws of engineering mechanics. 2. Analyze forces. 3. Equilibrium of a Particle 4. Moment of a Force 5. Structural Analysis 6. Laws of Motion. 7. Analyze the motion of mechanical systems.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, written exams, Quizzes, reports, Practical testing ,and Online testing.

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	113	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	
	Assignments	5	10% (10)	3,5,7,10,13	
	Projects / Lab.				
	Report	2	10% (10)	8 , 15	
Summative assessment	**Midterm Exam**	2 hr	20% (20)		
	Final Exam	2hr	50% (50)		
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	STATIC: Basic principles in mechanics, Vector Quantities and forces Analysis (2d ,3d)
Week 2	Equilibrium of a Particle (2d , 3d)
Week 3	Force System Resultants: Moment of a Force Scalar Formulation/Moment of a Force-Vector Formulation
Week 4	Force System Resultants: Moment of a Force about a Specified Axis/Moment of a Couple
Week 5	Equilibrium of a Rigid Body: Conditions for Rigid Body Equilibrium/ Free-Body Diagrams/ Equations of Equilibrium
Week 6	Equilibrium in three dimensions: Free-Body Diagrams/ Equations of Equilibrium

Week 7	Structural Analysis: Simple Trusses/ The Method of Joints/ Zero·Force Members
Week 8	Structural Analysis:The Method of Sections/ Space Trusses/ Frames and Machines
Week 9	DYNAMICS: Kinematics of a Particle/ Rectilinear Kinematics: Continuous Motion
Week 10	Motion of a Projectile
Week 11	Absolute Dependent Motion Analysis of Two Particles
Week 12	Kinetics of a Particle: Force and Acceleration
Week 13	Kinetics of a Particle: Work and Energy/ The Work of a Force
Week 14	Principle of Work and Energy
Week 15	Power and Efficiency

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Engineering Mechanics, Twelfth Edition, R. C. Hibbeler	Yes
Recommended Texts		
Websites		

Grading Scheme
مخطط الدرجات

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

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

	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	English 1			**Module Delivery**	
Module Type	S			☐ **Theory** ☒ **Lecture** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	MPAC104				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Refrigeration and Air Conditioning Techniques		**College**	Engineering	
Module Leader	**Ahmad Aliwi Samarmad**		**e-mail**	**ahmed.eleiwi@gmail.com**	
Module Leader's Acad. Title	lecturer.		**Module Leader's Qualification**	PHD	
Module Tutor			**e-mail**		
Peer Reviewer Name	no		**e-mail**		
Scientific Committee Approval Date	15/10/2024		**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 goal is to study English language and gain knowledge of it as benefit engineers in general, and to develop speaking skills and understand its basic rules taking the way to the acquisition of the ability to use technical key words in their work and the capability of communicating with other engineers correctly
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Developing speaking skills and understanding its basic rules to take the way to the acquisition of the ability to use technical keywords in their work and the capability of communicating with other engineers correctly .
Indicative Contents المحتويات الإرشادية	Through the prepared curriculum, the student acquires the ability to understand grammar English language through weekly lectures and classes in a gradual and sequential manner for a period of four years, starting from the first stage, such as interrogative, negative, formation of sentences, parts of speech, and others.

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

Student Workload (SWL) الحمل الدراسي للطالب			
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	5	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	20% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Parts of speech, vocabulary and comprehension
Week 2	Verb to be, present simple, vocabulary and comprehension.
Week 3	Possessive adjective, possessives, verb to have, verb to do, vocabulary and comprehension.
Week 4	Definite Indefinite articles, pronouns, subject, object,
Week 5	This and that, expletive there, prepositions, vocabulary and comprehension
Week 6	Plurals, , expressions of quantity, , vocabulary and comprehension
Week 7	Simple past, modal verbs, auxiliary verbs,
Week 8	Question words, asking questions, vocabulary and comprehension.
Week 9	Negative and interrogative, I would like and I like, vocabulary and comprehension.
Week 10	Writing a composition, punctuation, vocabulary and comprehension.
Week 11	Present continues, vocabulary and comprehension
Week 12	Types of questions, (yes -no) questions and (wh) questions
Week 13	Simple past, vocabulary and comprehension
Week 14	Simple past, revision
Week 15	Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Headway plus for beginners	Yes
Recommended Texts	Any Grammar and comprehension for technical learning	No
Websites	1- https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering 2- https://link.springer.com/book/10.1007/978-981-10-8624-3 3- https://progressivecollege.ie/courses/early-learning-and-care-qqi-level-5-major-award/?gad=1&gclid=EAIaIQobChMI_Nqu2tqA_wIVZ4VoCR2O0woLEAAYASAAEgI9WvD_BwE	

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 Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Mathematics			**Module Delivery**	
Module Type	S			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	MPAC100				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Refrigeration and Air Conditioning Techniques		**College**	Engineering	
Module Leader	Audai Hussein		**e-mail**	audai.hussein@uowa.edu.iq	
Module Leader's Acad. Title	Professor Doctor		**Module Leader's Qualification**	p.h.d	
Module Tutor	Zainab Abdul Karim Salem		**e-mail**	zainab.abdelkarim@uowa.edu.iq	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	15/10/2024		**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	Teaching the student the basic and advanced principles of calculus and its applications to develop the students mental abilities to solve problems and make use of available information in the other scientific materials.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	To apply the knowledge of mathematics, science and engineering fundamentals.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, seminars, Practical testing and Online testing.

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	113	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	10
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (15)	5, 10	LO #1, 2, 7 and 9
	Assignments	4	10% (15)	2, 8	LO # 3, 4, 5 and 6

	Projects / Lab.	0	0	0	
	Report	2	10% (10)	7,14	LO # 5, 6 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Determinants, properties,Grammar's rule, application of determinant
Week 2	Vectors, vectors in space, unit vector,Scalar product, vector product
Week 3	Trigonometric functions& relation,Graphing of functions, Trigonometric equations
Week 4	Function of limits, Algebraic limit,Trigonometric limit, Infinity as limit
Week 5	Derivative rule, Algebraic& Trigonometric derivative ,Chain rule, velocity& acceleration
Week 6	Inverse trigonometric functions& its derivative , Logarithm& Exponential functions& its derivative
Week 7	Hyperbolic functions& its derivative, Inverse hyperbolic functions& its derivative
Week 8	Integration, integrals of trigonometric& inverse functions , Integrals of logarithm& Exponential functions
Week 9	Integrals of logarithm& Exponential functions, Integrals of hyperbolic functions& its derivative,L'Hopitals's rules
Week 10	Integration methods; Integration by parts,Integration by partial fraction
Week 11	Integration by trigonometric substitution,Integration of ax2 + bx + c
Week 12	Application of Integration,Area under the curve& between two curves
Week 13	Surface area generated,Length of the curve
Week 14	Volume generated by rotation of curve,Simple differential equations
Week 15	Simpson rule for area,Trapezoidal rule for area, applications
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Advanced *Engineering Mathematics*	Yes
Recommended Texts	Calculus	Yes

Websites	

Grading Scheme

مخطط الدرجات

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

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	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electrical Engineering			Module Delivery	
Module Type	C			☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MPAC106				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level	1		Semester of Delivery	2	
Administering Department	Refrigeration and air conditioning technologies		College	TCB	
Module Leader	**Ahmad Aliwi Samarmad**		e-mail	**ahmed.eleiwi@gmail.com**	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	PHD	
Module Tutor	None		e-mail	E-mail	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date	15/10/2024		Version Number	1	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NA	**Semester**	
Co-requisites module	NA	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1. This is the basic subject for all electrical and electronic circuits. 2. This course deals with the basic concept of electrical circuits. 3. To understand voltage, current and power from a given circuit. 4. To develop problem solving skills and understanding of circuit theory through the application of techniques. 5. To understand Kirchhoff's current and voltage Laws problems.
Module Learning Outcomes	Upon completion of the course, students should be able to: 1. Define Ohm's law. 2. List the various terms associated with electrical circuits. 3. Recognize how electricity works in electrical circuits. 4. Describe electrical power, charge, and current. 5. Explain the two Kirchoff's laws used in circuit analysis. 6. Discuss the various properties of resistors, capacitors, and inductors. 7. Discuss the operations of sinusoid and phasors in an electric circuit. 8. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents	Indicative content includes the following. DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs]

	Revision problem classes. [6 hrs] Resistive networks, voltage and current sources, Thevenin equivalent circuits, current and voltage division, input resistance, output resistance, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, participation in the exercises, classes interactive tutorials, Quizzes and Practical testing

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem)	116	**Structured SWL (h/w)**	8
Unstructured SWL (h/sem)	59	**Unstructured SWL (h/w)**	6
Total SWL (h/sem)	210		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	20% (20)	3,5,9,12	LO #1,2,…..10
	Assignments	2	10% (10)	7, 8	LO # 8
	Report/Lab	1	10% (10)	continuous	LO # 11
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-12
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Resistance, conductance, effect of temp. on the resistance value
Week 2	Oham’s law, series connection, parallel connection, compound connection
Week 3	Voltage and current divider solved examples, kirchhoff’s laws
Week 4	Star-delta conversion examples
Week 5	Thevenin’s theorem, maximum power transfer
Week 6	Nodal method, superposition
Week 7	Alternating voltage and current

Week 8	Frequency, period, instantaneous value of voltage and current
Week 9	Component of A.C circuit, pure resistance, pure inductance, pure capacitance
Week 10	Series A.C circuit, R,L,C in series
Week 11	Impedance, phase angle, resonance, phase diagram
Week 12	Parallel A.C circuit, R,L,C, Admittance, power factor
Week 13	Active, reactive, apparent power in A.C circuit
Week 14	3-phase circuit
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Using Multimeter to measure Voltage, Current and Resistance
Week 2	Lab 2: Ohm's law.
Week 3	Lab 3: Voltage and current divider rules
Week 4	Lab 4: Kirchhoff's laws
Week 5	Lab 5: Thevenin's Theorem
Week 6	Lab 6: Series RLC circuit
Week 7	Lab 7: Parallel RLC circuit

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach, 2020.	No
Websites	https://docs.google.com/file/d/0B_O5jg0LZ_ZXYlg0WVU1bkhrLTg/edit	

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.

Course Description Form

1. Course Name:
Mechanical Design
2. Course Code:
MPAC305
3. Semester / Year:
Annual system 2024−2025
4. Description Preparation Date:
The beginning of the academic calendar for the year (2024−2025)
5. Available Attendance Forms:
Weekly Theoretical and practical lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
(90 theoretical and 30 practical) 120 hours/ 5 unit
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Lect. Riyam Abd-Alrazaq Salman Email: riyam.a@uowa.edu.iq
8. Course Objectives

Course Objectives	-Learning the design process of mechanical -To improve competence in multi-axis stress analysis. - To obtain a knowledge in the use of the proper failure theories under steady and variable loadings. -To develop the design skills of mechanical components under steady and variable loadings. - To be able to solve open-ended design problems, cope with decision making and satisfy competing objectives. -. Use and integrate the fundamentals studied previously towards the goal of analyzing and designing mechanical components to achieve satisfactory levels of safety and life.

9. Teaching and Learning Strategies	
Strategy	Assessment is based on hand-in assignments, Written exam, Quizzes, Tutorial, Seminars, Reports.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	6	Student understanding of the lecture	Simple Stresses in Machine Parts	Theoretical and practical lectures, scientific films, paper and electronic books	Daily and weekly tests, daily attendance, monthly tests, reports
3,4	6	Student understanding of the lecture	Engineering Materials and their Properties		
5,6	6	Student understanding of the lecture	Variable Stresses in Machine Parts		
7,8	6	Student understanding of the lecture	Combined Steady and Variable Stresses		
9,10	6	Student understanding of the lecture	Screwed Joints		
11	3	Student understanding of the lecture	Riveted Joints		
12,13	6	Student understanding of the lecture	Welded Joints		
14,15	6	Student understanding of the lecture	Power Screws design		

16,17 18	9	Student understanding of the lecture	Shafts design Key and coupling		
19	3	Student understanding of the lecture	Cotter joint		
20	3	Student understanding of the lecture	Knuckle joint		
21	3	Student understanding of the lecture	Clutches and brakes		
22,23	6	Student understanding of the lecture	Bearing design		
24,25	6	Student understanding of the lecture	Design of sliding bearing		
26,27	6	Student understanding of the lecture	Pressure vessels and pipes		
28	3	Student understanding of the lecture	Gears design		
29,30	6	Student understanding of the lecture			

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any	Machine Design - Khurmi
Main references (sources)	Machine Design - Khurmi
Recommended books and references (scientific journals, reports...)	- Design Of Machine Elements By Shishleys. Machine Design.
Electronic References, Websites	

Course Description Form

1. Course Name:

Heat Transfer/ 3rd

2. Course Code:

MPAC303

3. Semester / Year:

(Annual System) (2024−2025)

4. Description Preparation Date:

The beginning of the university calendar for the year (2024-2025)

5. Available Attendance Forms:

Theoretical and Practical Classes

6. Number of Credit Hours (Total) / Number of Units (Total)

(90 theoretical + 60 practical) 150 hours /8 units

7. Course administrator's name (mention all, if more than one name)

Name: Asst. Lect. Walaa Nasser Abbas
Email: walaa.na@uowa.edu.iq

8. Course Objectives

Course Objectives	• Introducing the student to the basic processes of heat transfer • Introducing the student to the different media of heat transfer • Introducing the student to the basic types of heat transfer • Teaching the student to calculate the thermal conductivity of various materials • Introducing the student to calculating the thermal loads of buildings • Introducing the student to the calculation of heat transfer by free and forced convection • Introducing the student to the types of heat exchangers • Teaching the student how to calculate thermal loads in heat exchangers • Teaching the student how to calculate the heat loads transmitted by radiation

9. Teaching and Learning Strategies

Strategy	1- Lectures and illustrations: Data Show 2- Practical tests using laboratory equipment 3- Multimedia using the e-learning system 4- Delivering a lecture, answering students' questions, and discussing with them.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3 theoretical + 2 practical	The student understand the lesson	Introduction, methods of heat transfer ,thermal equilibrium equation.	A theoretical and practical lectures	Weekly exams

2	3 theoretical+ practical	The student understand the lesson	The general equation for heat transfer by conduction, types of boundary conditions initial conditions.	A theoretical and practical lectures	Weekly exams, pre and post questions
3	3 theoretical+ practical	The student understand the lesson	Steady-state, one-dimensional conduction through a wall section, applying boundary conditions	A theoretical and practical lectures	Weekly exams, pre and post questions
4	3 theoretical+ practical	The student understand the lesson	Steady-state conduction in dimension through a cylindrical and spherical section with the application boundary conditions.	A theoretical and practical lectures	Weekly exams, pre and post questions
5	3 theoretical+ practical	The student understand the lesson	Steady-state conduction multilayer sections, total heat transfer coefficient	A theoretical and practical lectures	Weekly exams, pre and post questions
6	3 theoretical+ practical	The student understand the lesson	Critical dielectric thickness surface contact resistance.	A theoretical and practical lectures	Weekly exams, pre and post questions
7	3 theoretical+ practical	The student understand the lesson	Thermal conduction through regular and variable cross-section fins.	A theoretical and practical lectures	Weekly exams, pre and post questions
8	3 theoretical+ practical	The student understand the lesson	Fin efficiency, fin performance	A theoretical and practical lectures	Weekly exams, pre and post questions
9	3 theoretical+ practical	The student understand the lesson	Transitional conduction (unstable heat) analysis combined capacitances.	A theoretical and practical lectures	Weekly exams, pre and post questions
10-11	3 theoretical+ practical	The student understand the lesson	Numerical analysis of heat transfer by steady conduction in one dimension and two dimension	A theoretical and practical lectures	Weekly exams, pre and post questions
12	3 theoretical+ practical	The student understand the lesson	Numerical analysis of unsteady(transitional)thermal conductivity.	A theoretical and practical lectures	Weekly exams, pre and post questions
13	3 theoretical+ practical	The student understand the lesson	Heat transfer by convection (introduction), review of fluid flow (continuity equation, momen equation, energy equation).	A theoretical and practical lectures	Weekly exams, pre and post questions
14	3 theoretical+ practical	The student understand the lesson	The adjacent layer theory momentum and heat, analytical solution to the heat transfer equation by forced convection for both types of mass and laminar flow.	A theoretical and practical lectures	Weekly exams, pre and post questions
15	3 theoretical+ practical	The student understand the lesson	Heat transfer equation by fo convection in a steady state in one dimension.	A theoretical and practical lectures	Weekly exams, pre and post questions
16	3 theoretical+ practical	The student understand the lesson	Apparent temperature and r dimensional sums, the physical meaning of non-dimensional sums.	A theoretical and practical lectures	Weekly exams, pre and post questions
17	3 theoretical+ practical	The student understand the lesson	Experimental relationships forced convection heat transfe flow on a flat surface.	A theoretical and practical lectures	Weekly exams, pre and post questions

18	3 theoretical+ practical	The student understand the lesson	Experimental relationships heat transfer by forced convection of external flow on pipe and card assemblies.	A theoretical and practical lectures	Weekly exams, pre and post questions
19	3 theoretical+ practical	The student understand the lesson	Experimental relationships forced convection heat transfe internal flow through clo pipes and ducts.	A theoretical and practical lectures	Weekly exams, pre and post questions
20	3 theoretical+ practical	The student understand the lesson	The theory of heat transfer free convection.	A theoretical and practical lectures	Weekly exams, pre and post questions
21	3 theoretical+ practical	The student understand the lesson	Experimental relationships heat transfer by free convection.	A theoretical and practical lectures	Weekly exams, pre and post questions
22	3 theoretical+ practical	The student understand the lesson	Heat exchangers (introduction), Types of heat exchangers.	A theoretical and practical lectures	Weekly exams, pre and post questions
23	3 theoretical+ practical	The student understand the lesson	The total heat transfer coeffici the soiling coefficient, and logarithmic average of temperature difference.	A theoretical and practical lectures	Weekly exams, pre and post questions
24	3 theoretical+ practical	The student understand the lesson	Heat exchanger effectiven analysis of thermal performa in the heat exchanger for diffe types of flow.	A theoretical and practical lectures	Weekly exams, pre and post questions
25	3 theoretical+ practical	The student understand the lesson	(Thermal radiation) introduction - basic concepts.	A theoretical and practical lectures	Weekly exams, pre and post questions
26	3 theoretical+ practical	The student understand the lesson	Radiation properties, Kirchhoff's law, shape factor, Stephen Boltzmann equation, thermal radiation exchange between surfaces of black bodies.	A theoretical and practical lectures	Weekly exams, pre and post questions
27	3 theoretical+ practical	The student understand the lesson	Thermal radiation exchange between two surfaces of gray objects.	A theoretical and practical lectures	Weekly exams, pre and post questions
28	3 theoretical+ practical	The student understand the lesson	Thermal radiation exchange between the radiation barrier.	A theoretical and practical lectures	Weekly exams, pre and post questions
29	3 theoretical+ practical	The student understand the lesson	Heat transfer during boiling, boiling of a stagnant liquid, boiling cu and systems, experimental equations, improving heat transfer, boiling of a flowing liquid.	A theoretical and practical lectures	Weekly exams, pre and post questions
30	3 theoretical+ practical	The student understand the lesson	Heat transfer in the case condensation, membrane condensation, flow systems, experimental equations for heat transfer in membrane condensation (for a vertical surface, for inclined surface, for a horizo surface, for a horizontal ball	A theoretical and practical lectures	Weekly exams, pre and post questions

			cylinder, for a set of horizo tubes), membrane condensa inside a horizontal tube.		

11. Course Evaluation

1. Daily oral questions.
2. Discussion and dialogue with students
3. Attendance
4. Bi-monthly oral exams.
5. Monthly written tests.
6. Semester exam (first semester + second semester)
7. Final annual exam.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Principles of air conditioning - Dr. Munther Al-Droubi
Main references (sources)	1–Fundamentals of Heat and Mass Transfer 6th edition 2- Cengel Y A Heat Transfer A Practical Approach (Mgh, 2002)
Recommended books and references (scientific journals, reports…)	1- Air Conditioning Engineering - 5th Edition (Maelstrom)Maelstroms 2- Refrigeration and Air Conditioning – Abbas Al joubory
Electronic References, Websites	Refrigeration and Air Conditioning (MCQ)

Course Description Form

1. Course Name:

Air Conditioning and Refrigeration systems/ 3rd

2. Course Code:

MPAC304

3. Semester / Year:

(Annual System) (2024-2025)

4. Description Preparation Date:

The beginning of the academic calendar for the year (2024-2025)

5. Available Attendance Forms:

Theoretical and Practical Classes

6. Number of Credit Hours (Total) / Number of Units (Total)

(60 hrs. theoretical + 30 hrs. practical) 90 hours /5 units

7. Course administrator's name (mention all, if more than one name)

Name: Ihab Omar
Email: ihab.om@uowa.edu.iq

8. Course Objectives

Course Objectives	a) Helping the student understand the properties of the mixture of air and vapor. b) Helping the student to understand the behavior of the air and vapor mixture. c) Helping the student to understand and use the laws for calculating the properties of air and vapor mixtures. d) Helping the student understand, use and design fans. e) Helping the student understand, use and design water pipes f) Helping the student conduct a site survey of the air-conditioned space. g) Help the student calculate the heating and cooling load. h) Helping the student calculate the cooling load for freezer stores.

9. Teaching and Learning Strategies

Strategy	1- Lectures and illustrations: Data Show 2- Practical tests using laboratory equipment 3- Multimedia using the e-learning system 4- Giving the lecture, answering students' questions, and discussing with the students aspe that are not clear to them.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 theoretical + 1 practical	The student understands: 1. cooling and heating loa	Site survey of air conditioned space, relati between heat gain and cooling load.	A theoretical and a practical lecture	Weekly exams

2-4	2 theoretical + 1 practical	The student understands: 1. cooling and heating loa	Inside and outside design conditions, for winter & summer, heating load calculation (heat loss from windows, doors, walls, roof, floor, base of building, ventilation (air change method, air required for each person, air volume per unit area,) infiltration (crack method) total heating load.	A theoretical and a practical lecture	Weekly exams, pre and post questions
5	2 theoretical + 1 practical	The student understands: 1. cooling and heating load	Cooling load (radiation glasses, conduction heat transfer through walls, ro glasses,..etc using equival temperature deference,)	A theoretical and a practical lecture	Weekly exams, and post questions
6-7	2 theoretical + 1 practical	The student understands: 1. cooling and heating loa	Heat transfer through part ions, peoples heat generat people metabolic rate, lighting heat, motors & equipment, ventilation an infiltration load.	A theoretical and a practical lecture	Weekly exams, and post questions
9-11	2 theoretical + 1 practical	The student understands: 1. Psychrometric process	Psychrometric processes, cooling & dehumidificati cooling & dehumidificati in case of high latent load cooling & humidification evaporative cooling, heati & humidification.	A theoretical and a practical lecture	Weekly exams, and post questions
13	2 theoretical + 1 practical	The student understands: 1. design duct	Air ducting (pressure lose in straight duct, duct fittir (sudden enlargement & contraction, branches, ber ….etc)	A theoretical and a practical lecture	Weekly exams, and post questions
13	2 theoretical + 1 practical	The student understands: 1. design duct	Duct design, methods of design, equal friction method, balancing of duc system.	A theoretical and a practical lecture	Weekly exams, and post questions
14-15	2 theoretical + 1 practical	The student understands: 1. Fans 2. type 3. selection 4. design	Fans (type, selection, performance of centrifuga laws) room air distributio selection of supply & retu air opening, diffusers, gri return grilles.)	A theoretical and a practical lecture	Weekly exams, and post questions
16-17	2 theoretical + 1 practical	The student understands: 1. design pipe	Water piping design, pres losses in straight, and o links, valves, and accesso	A theoretical and a practical lecture	Weekly exams, and post questions

			cooling water pipes, w pipe network design.		
18-19	2 theoretical + 1 practic	The student understands: 1. Pumps 2. types	Pumps (performance, typ pump selections, design water distribution syster design of expansion tan	A theoretical and a practical lecture	Weekly exams, and post questions
17-18	2 theoretical + 1 practic	The student understands: 1. thermal properties of fo	Food thermal propertie water contain, primary freezing point, ice fracti density, specific heat.	A theoretical and a practical lecture	Weekly exams, and post questions
20	2 theoretical + 1 practic	The student understands: 1. thermal properties of f	Freezing and nonfreezir foods, thermal conductiv parallel method, respirat heat, heat transfer coeffic of surface.	A theoretical and a practical lecture	Weekly exams, and post questions
21	2 theoretical + 1 practic	The student understands: 1. Dual conduit systems	Dual conduit system, mu zone system comparativ study, psychometric cha	A theoretical and a practical lecture	Weekly exams, and post questions
22	2 theoretical + 1 practic	The student understands: 1. Estimation of Food cooling Time	Time of Food cooling and freezing.	A theoretical and a practical lecture	Weekly exams, and post questions
23	2 theoretical + 1 practic	The student understands: 1. Estimation of Food cooling Time	Estimation of Food cooli Time depending on dimensionless heat trans coefficient, method of freezing estimation.	A theoretical and a practical lecture	Weekly exams, and post questions
24	2 theoretical + 1 practic	The student understands: 1. Estimation of Food cooling Time	Blanc Equation for freez time estimation.	A theoretical and a practical lecture	Weekly exams, and post questions
25-26	2 theoretical + 1 practic	The student understands: 1. the food deceases	Refrigeration and the foo deceases, biological dece sources, microbes growth critical growth requireme of microbes, control of microbes growth, HACCI method.	A theoretical and a practical lecture	Weekly exams, and post questions
27-29	2 theoretical + 1 practic	The student understands: 1.Refrigeration Load	Thermal load of transportation, air filtrati equipment, safety facto total ref. load, principle freezing storage design volume calculation, desi of the storage constructi storage requirement,	A theoretical and a practical lecture	Weekly exams, and post questions
30	2 theoretical + 1 practic	The student understands: 1.Refrigeration Load	Methods of constructio space requirement, treatm of air and vapor infiltrati from cracks, floor structu preparing of the roof, wa derange, Freezing syste	A theoretical and a practical lecture	Weekly exams, and post questions

			,fan coil unit, valve selection, vale position system design, Refrigerat		

11. Course Evaluation

1. Daily oral questions.
2. Discussion and dialogue with students
3. Attendance
4. Bi-monthly oral exams.
5. Monthly written tests.
6. Semester exam (first semester + second semester)
7. Final annual exam.

12. Learning and Teaching Resources

Required textbooks (curricular book any)	"ASHRAE fundamentals Handbook for air conditioning Refrigeration", SI, 2013.
Main references (sources)	Wilbert F., Stoecker and Lekold W. Jones, " Refrigeration and Air condition McGraw-Hill, 1982 .
Recommended books and references (scientific journals, reports…)	1- Dr. Abdul Hadi N. Khalifa, Refrigeration and Air conditioning Engineering Dept. Engineering Technical College 3rd year – refrigeration and Air conditioning Course,2015. 2- Nihal E Wijeysundera, principles of heating ventilation and air conditioning worked examples
Electronic References, Websites	

Course Description Form

1. Course Name:
English language – Third class
2. Course Code:
MPAC308
3. Semester / Year:
(Annual System) (2024−2025)
4. Description Preparation Date:
The beginning of the university calendar for the year (2024-2025)
5. Available Attendance Forms:
Weekly
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hrs. (theoretical) / 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Lect. NoorUlhuda Salam Ahmed Email: nooralhuda.salam@uowa.edu.iq

8. Course Objectives	
Course Objectives	**Introducing the student to the importance of learning the English language it is the language of communication between engineers of different nationali through lectures, discussions and dialogues between students.**

9. Teaching and Learning Strategies	
Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	The student sh understand the less	Introduction - Textbook - Make a written test	Theoretical	Daily tests and monthly
2	1	The student sh understand the less	Hello	Theoretical	Daily tests and monthly
3	1	The student sh understand the less	Complement the unit	Theoretical	Daily tests and monthly
4	1	The student sh understand the less	All about you	Theoretical	Daily tests and monthly

5	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
6	1	The student sho understand the less	Family and friend	Theoretical	Daily tests and monthly
7	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
8	1	The student sho understand the less	The way I live	Theoretical	Daily tests and monthly
9	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
10	1	The student sho understand the less	Every day	Theoretical	Daily tests and monthly
11	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
12	1	The student sho understand the less	My favorites	Theoretical	Daily tests and monthly
13	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
14	1	The student sho understand the less	Times present	Theoretical	Daily tests and monthly
15	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
16	1	The student sho understand the less	Present simple	Theoretical	Daily tests and monthly
17	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
18	1	The student sho understand the less	Present continuous	Theoretical	Daily tests and monthly
19	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
20	1	The student sho understand the less	Present perfect	Theoretical	Daily tests and monthly
21	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
22	1	The student sho understand the less	Present perfect continuous	Theoretical	Daily tests and monthly
23	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
24	1	The student sho understand the less	Testing	Theoretical	Daily tests and monthly
25	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
26	1	The student sho understand the less	Testing	Theoretical	Daily tests and monthly
27	1	The student sho understand the less	Complement the unit	Theoretical	Daily tests and monthly
28	1	The student sho understand the less	Seminar	Theoretical	Daily tests and monthly

29	1	The student sho understand the less	Conservation	Theoretical	Daily tests and monthly
30	1	The student sho understand the less	Conservation	Theoretical	Daily tests and monthly

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricu books, if any)	
Main references (sources)	Headway Plus Pre-Intermediate
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Engineering and Numerical Analysis
2. Course Code:
MPAC300
3. Semester / Year:
Annual system 2024−2025
4. Description Preparation Date:
The beginning of the academic calendar for the year (2024−2025)
5. Available Attendance Forms:
Weekly Theoretical
6. Number of Credit Hours (Total) / Number of Units (Total) :
90 hours / 6 units
7. Course administrator's name (mention all, if more than one name)
Name: Ali Muselm Email: ali.muslim@uowa.edu.iq
8. Course Objectives

Course Objectives	This course aims to provide a good knowledg the students about the Engineering a numerical analysis with understand the basis solutions and their application in differ branches of engineering / mechanical, mater Civil and power

9. Teaching and Learning Strategies	
Strategy	1. Understand the methods of solutions for first, second and high orders differential equations and their engineering applications. 2. Understand the types and method of solution for Fourier Series and their engineering applications. 3. Understand the methods of solution by Laplace transformation and their applications. 4. Understand the methods of solution for partial differential equation and their engineering application. 106 5. Understand the numerical methods for solving linear and non-linear equations and their engineering applications. 6. Understand the numerical methods for solving the differential equations and their engineering applications.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	**4**	The student understands subject	First order differer equations, Special cases	Theoretical	Assignment and c

			first order D.E and t engineering		
2nd week	**4**	The student understands subject	applications.	Theoretical	Assignment and q
3rd week	**4**	The student understands subject	Second order linear equa with constant coefficients their engineering applicatio	Theoretical	Assignment and q
4th week	**4**	The student understands subject	High order linear differer equations , Integral opera and their enginee applications.	Theoretical	Assignment and q
5th week	**4**	The student understands subject	Fourier series, even and functions and their enginee applications.	Theoretical	Assignment and q
6th week	**4**	The student understands subject	Laplace transformat Inverse Lap transformation, Lap transformation to solution	Theoretical	Assignment and q
7th week	**4**	The student understands subject	differential equations and t engineering applications.	Theoretical	Assignment and q
8th week	**4**	The student understands subject	Partial differential equati solution by separation met and their enginee applications.	Theoretical	Assignment and q
9th week	**4**	The student understands subject	Nonlinear equations solut Simple Iteration, New Raphson, finite differe methods.	Theoretical	Assignment and q
10th weel	**4**	The student understands subject	Solution of simultane linear equations, Direct Indirect methods	Theoretical	Assignment and q
11th weel	**4**	The student understands subject	10 Interpolation by Lagran and Newton methods.	Theoretical	Assignment and q
12th weel	**4**	The student understands subject	Curves fitting analysis Newton method.	Theoretical	Assignment and q
13th weel	**4**	The student understands subject	Numerical integrat complex numerical integra and their applications.	Theoretical	Assignment and q
14th weel	**4**	The student understands subject	Numerical method to s partial differential equat by separation method.	Theoretical	Assignment and q
15th weel	**4**	The student understands subject	Numerical method to s differential equations by Ra Kotta and Power series.	Theoretical	Assignment and q
16th weel	**4**	The student understands subject	Newton-Raphson method	Theoretical	Assignment and q
17th weel	**4**	The student understands subject	finite difference method	Theoretical	Assignment and q
18th weel	**4**	The student understands subject	Interpolation	Theoretical	Assignment and q
19th weel	**4**	The student understands subject	Lagrangian method	Theoretical	Assignment and q
20th weel	**4**	The student understands subject	Solution of simultane linear equations.	Theoretical	Assignment and q
21st week	**4**	The student understands subject	Direct methods. Indi methods	Theoretical	Assignment and q
22nd wee	**4**	The student understands subject	Numerical integrat Complex numer integration, applications	Theoretical	Assignment and q

23rd wee	**4**	The student understands subject	Curves fitting analysis	Theoretical	Assignment and q
24th weel	**4**	The student understands subject	Newton method	Theoretical	Assignment and q
25th weel	**4**	The student understands subject	Numerical method to s differential equations	Theoretical	Assignment and q
26th week	**4**	The student understands subject	Rang-Kotta method	Theoretical	Assignment and q
27th week	**4**	The student understands subject	Power series method	Theoretical	Assignment and q
28th week	**4**	The student understands subject	Exponential equations	Theoretical	Assignment and q
29th week	**4**	The student understands subject	Frobinous method	Theoretical	Assignment and q
30th week	**4**	The student understands subject	Preparatory week before final Exam	Theoretical	Assignment and q

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- Advanced Engineering Mathematics, Erwin Kreysz John Wiley & Sons, Inc. - 2- Advanced Engineering Mathematics, Peter V. O'N Thomson Brooks/Cole – 3- Advanced Engineering Mathematics, A.B. Mathur & Y Jaggi, Khanna Publishers – 4- Advanced Engineering Mathematics, Wyle Barrett /t edition.
Main references (sources)	1- Numerical Methods for Scientists and Engine R.w. Hamming knowledge. – 2- 2- Numerical Analysis, Richard L. Burden & Douglas Faires.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Computer Application II
2. Course Code:
MPAC301
3. Semester / Year:
Annual system / 2024-2025
4. Description Preparation Date:
The beginning of the university calendar for the year (2024-2025)
5. Available Attendance Forms:
Weekly 3 hours (theoretical + practical)
6. Number of Credit Hours (Total) / Number of Units (Total)
(30 theoretical hours + 60 practical hours)90 hours/4 units
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Lect. Saja Abdul Hamza Email: saja.abdulhamza@uowa.edu.iq
8. Course Objectives

Course Objectives	1. The ability to keep pace with scientific and technical modernity 2. Demonstrate the student's ability to use knowledge to prepare scientific and applied research. 3. The ability to think to extract engineering solutions to problems related to air conditioning systems. 4. The ability to use electronic programs to solve problems with air conditioning systems. 5. Teaching leadership skills, the value and quality of commitment, love of work and loyalty to it

9. Teaching and Learning Strategies	
Strategy	Explaining the lesson material in a clear manner to the student, th working on applying the explanations on the computer. Involving the student in the lecture and explaining the available wo possibilities and the various applications of this program.

10. Course Structure

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

1 2 3 4	3	Student understanding of the lecture	Gear connection: - Nuts - Bolts - Al-Washrat	Daily and weekly testing	Theoretical and practical lecture
5	3	Student understanding of the lecture	Transmission shafts of all kinds,	Daily and weekly testing	Theoretical and practical lecture
6	3	Student understanding of the lecture	drawing Cylinder	Daily and weekly testing	Theoretical and practical lecture
7	3	Student understanding of the lecture	Multi-section transmission shaft	Daily and weekly testing	Theoretical and practical lecture
8	3	Student understanding of the lecture	Gears	Daily and weekly testing	Theoretical and practical lecture
9	3	Student understanding of the lecture	Al-Dashli	Daily and weekly testing	Theoretical and practical lecture
10	3	Student understanding of the lecture	The Sandpaper	Daily and weekly testing	Theoretical and practical lecture
11	3	Student understanding of the lecture	Fillet	Daily and weekly testing	Theoretical and practical lecture
12	3	Student understanding of the lecture	Transmission shaft accessories	Daily and weekly testing	Theoretical and practical lecture
13	3	Student understanding of the lecture	Rolling supports	Daily and weekly testing	Theoretical and practical lecture
14	3	Student understanding of the lecture	Pipes (peripheral and central)	Daily and weekly testing	Theoretical and practical lecture
15	3	Student understanding of the lecture	Leakage contraindications	Daily and weekly testing	Theoretical and practical lecture
16	3	Student understanding of the lecture	Bush: Assembly drawing exercise	Daily and weekly testing	Theoretical and practical lecture
17-21	3	Student understanding of the lecture	Springs: - Compressive - Stretching - Torsional	Daily and weekly testing	Theoretical and practical lecture
22-23	3	Student understanding of the lecture	Assembly drawing exercise	Daily and weekly testing	Theoretical and practical lecture
24-25	3	Student understanding	Threshold clips	Daily and weekly testing	Theoretical and practical lecture

		of the lecture			
26	3	Student understanding of the lecture	the accounts	Daily and weekly testing	Theoretical and practical lecture
27	3	Student understanding of the lecture	Moment of inertia	Daily and weekly testing	Theoretical and practical lecture
28	3	Student understanding of the lecture	Assembly drawing exercise	Daily and weekly testing	Theoretical and practical lecture
29-30	3	Student understanding of the lecture	Tenderness	Daily and weekly testing	Theoretical and practical lecture

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books any)	Engineering Design and Graphics with SolidWorks® by James D. Bethune
Main references (sources)	Engineering Design and Graphics with SolidWorks® by James D. Bethune
Recommended books and references (scientific journals, reports…)	Engineering Design and Graphics with SolidWorks® by James D. Bethune
Electronic References, Websites	https://youtube.com/@mohammedalzubaidy7979?si=GcMp-LCnajh8ZJec

Course Description Form

1. Course Name:
Air Conditioning systems Drawing
2. Course Code:
MPAC309
3. Semester / Year:
Annual
4. Description Preparation Date:
The beginning of the academic calendar for the year (2024-2025)
5. Available Attendance Forms:
Official working hours of 3 practical hours
6. Number of Credit Hours (Total) / Number of Units (Total)
(90 practical) (90) Hours / Number of Units (2)
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Lech. Hussein Ali Jaffar Email: hussein.a.j@gmail.com
8. Course Objectives

Course Objectives	**1. To enable and qualify the student to understand the architectural plans and their sections.** **2. To draw and understand the mechanical layouts of the ducting network for ventilation.** **3. To provide the ability to draw the piping network of the central air conditioning systems with all the necessary accessories of valves, fittings and sensors.** **4. To draw the detail drawings of the air conditioning devices of fan coil units, chillers, boilers, air handling units, and cooling towers.** **5. To design VRF systems for selective AC companies.** **6. To understand the electrical and control diagrams of the air conditioning systems.**

9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises. This will be achieved through classes, interactive tutorials and by considering some simple real projects as well as site visiting for finished and ongoing projects.
10. Course Structure	

	Material Covered
Week 1	Making site survey
Week 2	Draw architectural plans
Week 3	Draw elevation plans
Week 4	Cooling load estimation
Week 5	Specify the required ventilation
Week 6	Package units, fan coil units and AHUs selection
Week 7	Design ducting network by Duct Sizer
Week 8	Drawing ducting network
Week 9	Midterm Exam
Week 10	Chillers, boilers, cooling towers and pumps selection
Week 11	Design piping system by Pipe Sizer
Week 12	Drawing the piping system
Week 13	VRV/VRF system design and drawing
Week 14	Drawing the electrical and control diagram of central air conditioning system
Week 15	Drawing the electrical and control diagram of VRV/VRF systems

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Main references (sources)	2021 ASHRAE handbook. Fundamentals
Recommended books and references (scientific journals, reports…)	Design manual for heating, ventilation and air conditioning with coordinated standard details: Lee Kendrick, Julian C. Gonzalez,1986
Electronic References, Websites	Principles of heating, ventilating, and air conditioning: a textbook with design data based on the 2021 ASHRAE handbook--Fundamentals

نموذج وصف المقرر

١. اسم المقرر	
صيانة انظمة تكييف الهواء/مرحلة ثالثة	
٢. رمز المقرر	
MPAC410	
٣. الفصل / السنة	
سنوي	
٤. تاريخ اعداد هذا الوصف	
بداية التقويم الدراسي للعام الدراسي (2024-2025)	
٥. اشكال الحضور المتاحة	
دوام رسمي بواقع 3 ساعات اسبوعيا / نظري و عملي	
٦. عدد الساعات الدراسية (الكلي)/عدد الوحدات (الكلي)	
(30 ساعه نظري +60 ساعة عملي) 90 ساعة /4 وحدات	
٧. اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر)	
الاسم : م.م. امين سامي امين aminsami2000@yahoo.com	
٨. اهداف المقرر	
اهداف المادة الدراسية	• دراسة صيانة جميع أنواع أنظمة التبريد. • تعريف الطالب بكافة المواضيع الأساسية لهذا المقرر الجانب النظري والجانب العملي. • يقدم نظريات وعمليات نظام التدفئة وتكييف الهواء. يشمل الخدمة واختبار وإصلاح أنظمة تكييف الهواء والتهوية والسخان وتبريد المحرك
٩. استراتيجيات التعليم والتعلم	
استراتيجية	١- يعتمد التقييم على المهام اليدوية والامتحانات الكتابية والاختبارات والتقارير والاختبار العملي والاختبار عبر الإنترنت.

١٠. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الاول	1 نظري + 3 عملي	الطالب يفهم الموضوع	Introduction to Control Systems, Open and Closed Systems.	نظري + عملي	quiz
الثاني	1 نظري + 3 عملي	الطالب يفهم الموضوع	Introduction to Control Systems, Open and Closed Systems.	نظري + عملي	quiz
الثالث	1 نظري + 3 عملي	الطالب يفهم الموضوع	Mathematical Modeling of Physical Systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.	نظري + عملي	quiz
الرابع	1 نظري + 3 عملي	الطالب يفهم الموضوع	Mathematical Modeling of Physical Systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.	نظري + عملي	quiz
الخامس	1 نظري + 3 عملي	الطالب يفهم الموضوع	Mathematical Modeling of Physical Systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.	نظري + عملي	quiz
السادس	1 نظري + 3 عملي	الطالب يفهم الموضوع	Mathematical Modeling of Physical Systems and Transfer Functions, Mathematical Modeling of D.C. Servo Motor.	نظري + عملي	quiz
السابع	1 نظري + 3 عملي	الطالب يفهم الموضوع	Block Diagrams.	نظري + عملي	quiz
الثامن	1 نظري + 3 عملي	الطالب يفهم الموضوع	Block Diagrams.	نظري + عملي	quiz

التاسع	1 نظري + 3 عملي عملي	الطالب يفهم الموضوع	Time Domain Analysis of Closed Loop Control Systems and Error Analysis.	نظري + عملي	quiz
العاشر	1 نظري + 3عملي	الطالب يفهم الموضوع	Time Domain Analysis of Closed Loop Control Systems and Error Analysis.	نظري + عملي	quiz
الحادي عشر	1 نظري + 3 عملي	الطالب يفهم الموضوع	P, PI, PD, and PID Modes of Feedback Control, Realization of PID Controller Using Active and Passive Elements.	نظري + عملي	quiz
الثاني عشر	1 نظري + 3 عملي عملي	الطالب يفهم الموضوع	P, PI, PD, and PID Modes of Feedback Control, Realization of PID Controller Using Active and Passive Elements.	نظري + عملي	quiz
الثالث عشر	1 نظري + 3عملي	الطالب يفهم الموضوع	Stability Analysis and Rouths Stability Criterion.	نظري + عملي	quiz
الرابع عشر	1 نظري + 3 عملي عملي	الطالب يفهم الموضوع	Stability Analysis and Rouths Stability Criterion.	نظري + عملي	quiz
الخامس عشر	1 نظري + 3عملي	الطالب يفهم الموضوع	Root Locus Technique.	نظري + عملي	quiz
السادس عشر	1 نظري + 3عملي	الطالب يفهم الموضوع	Root Locus Technique.	نظري + عملي	quiz
السابع عشر	1 نظري + 3عملي	الطالب يفهم الموضوع	Root Locus Technique	نظري + عملي	quiz
الثامن عشر	1 نظري + 3عملي	الطالب يفهم الموضوع	Analysis of Control System in Frequency Domain and Bode Diagrams.	نظري + عملي	quiz

التاسع عشر	1 نظري + 3 عملي	الطالب يفهم الموضوع	Analysis of Control System in Frequency Domain and Bode Diagrams.	نظري + عملي	quiz
العشرون	1 نظري + 3 عملي	الطالب يفهم الموضوع	Analysis of Control System in Frequency Domain and Bode Diagrams.	نظري + عملي	quiz
الحادي والعشرون	1 نظري + 3 عملي	الطالب يفهم الموضوع	Design of Control Systems and Compensation concepts.	نظري + عملي	quiz
الثاني و عشرون	1 نظري + 3 عملي	الطالب يفهم الموضوع	Control System Design Using Root Locus Method.	نظري + عملي	quiz
الثالث والعشرون	1 نظري + 3 عملي	الطالب يفهم الموضوع	Control System Design Using Root Locus Method.	نظري + عملي	quiz
الرابع والعشرون	1 نظري + 3 عملي	الطالب يفهم الموضوع	Control System Design Using Root Locus Method.	نظري + عملي	quiz
الخامس والعشرون	1 نظري + 3 عملي	الطالب يفهم الموضوع	Control System Design Using Root Locus Method.	نظري + عملي	quiz
السادس والعشرون	1 نظري + 3 عملي	الطالب يفهم الموضوع	Control System Design Using Bode Diagrams.	نظري + عملي	quiz
السابع و العشرون	1 نظري + 3 عملي	الطالب يفهم الموضوع	Control System Design Using Bode Diagrams.	نظري + عملي	quiz
الثامن والعشرون	1 نظري + 3 عملي	الطالب يفهم الموضوع	Control System Design Using Bode Diagrams.	نظري + عملي	quiz
التاسع والعشرون	1 نظري + 3 عملي	الطالب يفهم الموضوع	Control System Design Using Bode Diagrams.	نظري + عملي	quiz

الثلاثون	1 نظري + 3 عملي	الطالب يفهم الموضوع	Definitions of Non Linear Systems.	نظري + عملي	quiz

١. تقيم المقرر	
توزيع الدرجة من 100 على وفق المهام المكلف بها الطالب مثل التحضير اليومي و الامتحانات اليومية و الشفوية و الشهرية و التحريرية و التقارير ....ألخ	
٢. مصادر التعلم والتدريس	
الكتب المقررة المطلوبة (المنهجية أن وجدت)	frigeration and air conditioning Technology
المراجع الرئيسة (المصادر)	ɔdren refrigeration and airconditioning maintenance
الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية , التقارير .....)	
المراجع الاكترونية , مواقع الانترنيت	

Course Description Form

1. Course Name:

Theory of machine and vibration

2. Course Code:

WAR-30-04

3. Semester / Year:

third stage/yearly

4. Description Preparation Date:

The beginning of the academic calendar for the year (2024-2025)

5. Available Attendance Forms:

Weekly / theoretical and practical

6. Number of Credit Hours (Total) / Number of Units (Total)

(60 hours theoretical+ 30 hours practical)90 hours/ 5 units

7. Course administrator's name (mention all, if more than one name)

Name: lec. Ali hammoudi Alwazir
Email: ali.ham@uowa.edu.iq

8. Course Objectives

Course Objectives	To develop students' fundamental knowledge and insight into the theory of machines, balancing of rotating masses, theory of gears, governors, cams, belts, free vibrations and damped vibration to be used in machines design

9. Teaching and Learning Strategies

Strategy	Assessment is based on hand-in assignments, Written exam, Quizzes, Tutorial, Seminars, Reports

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st week	3 Theoretical + 1practical.	The student understands the subject	Introduction and Definition. Graphical Representation of Displacement, velocity and acceleration with respect time. Solved problems	Theoretical + practical	quiz

2nd week	3 Theoretical + 1 practical	The student understands the subject	Velocity in mechanisms	Theoretical + practical	quiz
3rd week	3 Theoretical + 1 practical	The student understands the subject	Solved problems for velocity in mechanisms. Acceleration in mechanisms	Theoretical + practical	quiz
4th week	3 Theoretical + 1practical	The student understands the subject	Accelerations in slider crank mechanisms. Solved problems for acceleration in mechanisms	Theoretical + practical	quiz
5th week	3Theoretical + 1 practical	The student understands the subject	Balancing of rotating masses. Balancing of a single rotating mass by a single mass rotating in the same plane. Balancing of a single rotating mass by two masses rotating in different planes. Balancing of several masses rotating in the same plane. (a) Analytical method. (b) Graphical method	Theoretical + practical	quiz
6th week	3 Theoretical + 1 practical	The student understands the subject	Balancing of several masses rotating in different planes. Solved problems	Theoretical + practical	quiz
7th week	3Theoretical + 1 practical	The student understands the subject	Classification of gears, spur gears, velocity ratio (gear ratio). Center to center distance	Theoretical + practical	quiz
8th week	3 Theoretical +1practical	The student understands the subject	Gear trains, velocity ratio of simple gear trains, velocity ratio of compound gear trains, solved problems	Theoretical + practical	quiz
9th week	3 Theoretical + 1 practical	The student understands the subject	Epicyclical gear trains, simple epicyclical gear trains	Theoretical + practical	quiz
10th week	3 Theoretical +1 practical	The student understands the subject	Compound epicyclical gear trains	Theoretical + practical	quiz
11th week	3 Theoretical + 1practical	The student understands the subject	Solved problems	Theoretical + practical	quiz

12th week	3 Theoretical + 1practical	The student understands the subject	Types of governors, watt governor, solved problems	Theoretical + practical	quiz
13th week	3 Theoretical +1 practical	The student understands the subject	Porter governor: (a) Equilibrium method. (a) Instantaneous center	Theoretical + practical	quiz
14th week	3 Theoretical + 1 practical	The student understands the subject	Proell governor, Hartnell governor, solved problems	Theoretical + practical	quiz
15th week	3 Theoretical + 1 practical	The student understands the subject	Types of belts, types of flat belt drive, selection of belt drive. Velocity ratio of open belt drive. Effect of belt thickness on Velocity ratio, slip of the belt. Creep of the belt	Theoretical + practical	quiz
16th week	3 Theoretical + 1practical	The student understands the subject	Velocity ratio of a compound belt drive. Length of belt. (a)Open belt. (b)Cross belt. Ratio of driving tension for flat belts. Determination of angle of contact. (a)Open belt. (b)Cross belt.	Theoretical + practical	quiz
17th week	3 Theoretical + 1 practical	The student understands the subject	Power transmitted by a belt. Centrifugal tension (Tc). Maximum tension in the belts (Tmax). Condition for the Transmission of Maximum Power. Initial tension in the belt (to).V – Belt drive and rope drive. Solved problems	Theoretical + practical	quiz
18th week	3 Theoretical + 1 practical	The student understands the subject	Types of brakes. Simple block or shoe brake. (a) Single block or shoe brake. (b) Double block or shoe brake. Band brake: (a) Simple band brake. (b) Differential band brake.	Theoretical + practical	quiz
19th week	3 Theoretical +1practical	The student understands the subject	Band and block brake. Internal expanding shoe brake.	Theoretical + practical	quiz

			The braking of a vehicle. (a) Value of retardation when the brakes are applied to rear wheels only. (b) Value of retardation when the brakes are applied to front wheels only. (c) Value of retardation when the brakes are applied to all the wheels. Solved problems		
20th week	3 Theoretical + 1practical	The student understands the subject	Types of followers. Nomenclatures for cam profile. Motions of the follower. (a) Uniform motion or uniform velocity of a follower. Solved problems	Theoretical + practical	quiz
21st week	3Theoretical + 1practical	The student understands the subject	(b) Simple harmonic motion of follower. (c) Uniform acceleration and uniform retardation. Solve problems	Theoretical + practical	quiz
22nd week	3 Theoretical +1practical	The student understands the subject	Cam profile construction. Solve problems	Theoretical + practical	quiz
23rd week	3 Theoretical +1 practical	The student understands the subject	Types of vibration. Important definitions for vibrating motion. Equivalent spring stiffness. Solved problems	Theoretical + practical	quiz
24th week	3Theoretical + 1 practical	The student understands the subject	Free vibrations. Methods of finding the natural frequency of free. Longitudinal vibrations. (a) Equilibrium method. (b) Energy method. (c) Rayleigh's method. Method for natural frequency of free transverse vibration.	Theoretical + practical	quiz

			Solved problems		
25th week	3 Theoretical +1 practical	The student understands the subject	Natural frequency of transverse vibrations of shafts or Beams under different types of loads and end conditions. (a) Natural frequency of a shaft carrying a single concentrated load. (b) Natural frequency of a shaft carrying a uniformly distributed load. Natural frequency of transverse vibration of a system of several load attached to the same shaft. (a) Energy or (Rayleigh's) method. Dunkerley's method. Solved problems	Theoretical + practical	quiz
26th week	3 Theoretical + 1 practical	The student understands the subject	Whirling speeds or critical speeds. Solved problems	Theoretical + practical	quiz
27th week	3 Theoretical + 1 practical	The student understands the subject	Frequency of free damped vibrations (viscous damping). Solve problems Expression for displacement for over-damped, under-damped and critical-damped system. Logarithmic decrement. Solved problems	Theoretical + practical	quiz
28th week	3 Theoretical + 1 practical	The student understands the subject	Expression for displacement for over-damped, under-damped and critical-damped system. Logarithmic decrement. Solved problems	Theoretical + practical	quiz

29th week	3 Theoretical + 1 practical	The student understands the subject	Natural frequency of free torsional vibrations. Free torsional vibrations of a single rotor system. Free torsional vibrations of a two rotor system.	Theoretical + practical	quiz
30th week	3 Theoretical + 1 practical	The student understands the subject	Torsional equivalent shaft. Solved problems	Theoretical + practical	quiz

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- Theory of machine and vibration, by gubta and kromy,2004 2- Theory of machine and vibration, by tomes beven,1995. 3-machine design, by gubta ,2004
Main references (sources)	Theory of machine and vibration, by gubta and kromy,2004
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:

Electrical and Electronic Engineering / 3rd

2. Course Code:

MPAC311

3. Semester / Year:

(Annual System) (2024-2025)

4. Description Preparation Date:

university calendar for the year (2024-2025)

5. Available Attendance Forms:

Theoretical and Practical Classes

6. Number of Credit Hours (Total) / Number of Units (Total)

Units (Total) 90 hrs. (theoretical) + 60 hrs. (practical) /4 units

7. Course administrator's name (mention all, if more than one name)

Name: Asst.Prof.Dr. Muhannad Kamil
Email: muhannad.k@uokerbla.edu.iq

8. Course Objectives

Course Objectives	1- Introducing the student to the basic processes of Electrical and Electro Engineering 2- To study the principles of electrical machines and electronic devices necessary refrigeration and air conditioning engineers.

9. Teaching and Learning Strategies

Strategy	1- Lectures and illustrations: Data Show 2- Multimedia using the e-learning system 3- Knowing the students and developing their respect 4- Effective questioning techniques and discussion with them. 5- Explicitly teach thinking skills & problem-solving techniques

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3 theoretical + 2 practical	understand the lesson	D.C motors, constructio commutator, types of D. motors	Theoretical & pract lectures	Quiz& Discussion
2	3 theoretical + 2 practical	understand the lesson	Back e.m.f, speed equati speed control	Theoretical & pract lectures	Quiz& Discussion
3	3 theoretical + 2 practical	understand the lesson	Starting of D.C mo starter connection, tor of D.C motors	Theoretical & pract lectures	Quiz& Discussion

4	3 theoretical + 2 practical	understand the lesson	Speed-torque characteristics of each t of D.C motor	Theoretical & practi lectures	Quiz& Discussion
5	3 theoretical + 2 practical	understand the lesson	Examples to evaluate starting current of I motor with and with starter, also for sp control	Theoretical & practi lectures	Quiz& Discussion
6	3 theoretical + 2 practical	understand the lesson	Single phase induct motor, split-pha capacitor-start, shad pole type	Theoretical & practi lectures	Quiz& Discussion
7	3 theoretical + 2 practical	understand the lesson	3-phase induction moto construction , syn Speed, slip .	Theoretical & practi lectures	Quiz& Discussion
8	3 theoretical + 2 practical	understand the lesson	Control of three-ph induction motor us voltage freque control .	Theoretical & practi lectures	Quiz& Discussion
9	3 theoretical + 2 practical	understand the lesson	Starting of 3-ph induction motor, star-d method, step do transformer	Theoretical & practi lectures	Quiz& Discussion
10	3 theoretical + 2 practical	understand the lesson	Torque characteristic, n torque	Theoretical & practi lectures	Quiz& Discussion
11	3 theoretical + 2 practical	understand the lesson	3-phase system, star delta connection, l current, line voltage, ph current and voltage	Theoretical & practi lectures	Quiz& Discussion
12	3 theoretical + 2 practical	understand the lesson	Instruments measurements, ammet voltmeter, ohmmeter, k h meters .	Theoretical & practi lectures	Quiz& Discussion
13	3 theoretical + 2 practical	understand the lesson	Contactors, relays, time	Theoretical & practi lectures	Quiz& Discussion
14	3 theoretical + 2 practical	understand the lesson	Thermal overload, sta (contactor +timer)	Theoretical & practi lectures	Quiz& Discussion
15	3 theoretical + 2 practical	understand the lesson	Fuse, circuit break types, choice	Theoretical & practi lectures	Quiz& Discussion
16	3 theoretical + 2 practical	understand the lesson	Voltage drop in cables	Theoretical & practi lectures	Quiz& Discussion
17	3 theoretical + 2 practical	understand the lesson	Calculation for choice size of cable	Theoretical & practi lectures	Quiz& Discussion
18	3 theoretical + 2 practical	understand the lesson	Diode, V-I characteris half –wave rectifier	Theoretical & practi lectures	Quiz& Discussion
19	3 theoretical + 2 practical	understand the lesson	Full-wave rectifier, bri and center-top transfor rectifier	Theoretical & practi lectures	Quiz& Discussion
20	3 theoretical + 2 practical	understand the lesson	Transistor, constructi types	Theoretical & practi lectures	Quiz& Discussion

21	3 theoretical + 2 practical	understand the lesson	Transistor biasi collector characteri curves.	Theoretical & practi lectures	Quiz& Discussion
22	3 theoretical + 2 practical	understand the lesson	Saturation, active, bre down region and cu regions	Theoretical & practi lectures	Quiz& Discussion
23	3 theoretical + 2 practical	understand the lesson	Transistor as amplifier Transistor as electro switch.	Theoretical & practi lectures	Quiz& Discussion
24	3 theoretical + 2 practical	understand the lesson	Thyristor , constructio characteristics , silic controlled rectifier .	Theoretical & practi lectures	Quiz& Discussion
25	3 theoretical + 2 practical	understand the lesson	Effect of firing angle on SCR .	Theoretical & practi lectures	Quiz& Discussion
26	3 theoretical + 2 practical	understand the lesson	SCR applications.	Theoretical & practi lectures	Quiz& Discussion
27	3 theoretical + 2 practical	understand the lesson	Diac – Traic characteristics applicati with SCR .	Theoretical & practi lectures	Quiz& Discussion
28	3 theoretical + 2 practical	understand the lesson	Control of A.C devi using solid – state sp control choppers.(1)	Theoretical & practi lectures	Quiz& Discussion
29	3 theoretical + 2 practical	understand the lesson	Control of A.C devi using solid – state sp control choppers.(2)	Theoretical & practi lectures	Quiz& Discussion
30	3 theoretical + 2 practical	understand the lesson	Operational amplifier 74	Theoretical & practi lectures	Quiz& Discussion

11. Course Evaluation

1. Discussion and questions with students
2. Attendance and homework
3. Monthly Exam.
4. Semester exam (first semester + second semester)
5. Final annual exam.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Basic Electrical And Electronics Engineering By S. K. BHATTACHARYA
Main references (sources)	Electrical Engineering, Principles & Applications By Allan Hambley
Recommended books and references (scientific journals, reports…)	Fundamentals of Electrical Engineering and Electronics Theraja, B.L.
Electronic References, Websites	https://electronics.wisc-online.com/ https://electrical-engineering-portal.com

	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Applications 1**			**Module Delivery**	
Module Type	**S**			☐ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MPAC207**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	2		**Semester of Delivery**	2	
Administering Department	Refrigeration and Air Conditioning Techniques		**College**	Engineering	
Module Leader	NoorUlhuda Salam Ahmed		**e-mail**	nooralhuda.salam@uowa.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	M.SC	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	Name		**e-mail**	None	
Scientific Committee Approval Date	15 / 10/2024		**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	To make the student able to process, program, and solve arithmetic and engineering problems using Matlab
Module Learning Outcomes	1. To apply the knowledge about Matlab. 2. To enable students solve scientific and mathematical problems, write codes, design projects and process images.
Indicative Contents	

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, seminars, Practical testing and Online testing.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem)	88	**Structured SWL (h/w)**	6
Unstructured SWL (h/sem)	13	**Unstructured SWL (h/w)**	6
Total SWL (h/sem)	75		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	20% (20)	3,5,6,10	LO #1,2,…..10
	Assignments	2	10% (10)	7, 8	LO # 8
	Seminar	1	10% (10)	11	LO # 11
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	LO # 1-12
	Final Exam	3hr	50% (50)	16	All

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد

	Material Covered
Week 1	Introduction to Matlab
Week 2	Mathematical Functions
Week 3	Vectors & Matrices
Week 4	Vectors & Matrices
Week 5	Introduction to Programming in MATLAB
Week 6	Control flow
Week 7	Control flow
Week 8	Debugging
Week 9	Mathematical Equations
Week 10	Graph Plot
Week 11	GUI
Week 12	GUI
Week 13	Image Processing
Week 14	Simulink
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Matlab and Mathematical Functions
Week 2	Lab 2: Vectors & Matrices
Week 3	Lab 3: Control flow
Week 4	Lab 4: Mathematical Equations
Week 5	Lab 5: GUI
Week 6	Lab 6: Image Processing
Week 7	Lab 7: Simulink

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Recommended Texts (Website)	https://www.mathworks.com/products/matlab.html	

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 Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mechanical Drawing**			**Module Delivery**	
Module Type	**C**			☐ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	MPAC201				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Refrigeration and Air Conditioning Techniques		**College**	Engineering	
Module Leader	Ali Hammoudi Alwazir		**e-mail**	ali.ham@uowa.edu.iq	
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor	Salma Mahmood Mezhar		**e-mail**	Salma.mahmood@uowa.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	15 / 10/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims	To teach the student, 1. the basic skill of reading engineering drawing along with their simples and terms as well as the standards 2. . joining, bolts and gears, knowledge of assembly drawings 3. how to use ACD in mechanical drawing 4. fits and tolerances		
Module Learning Outcomes	Upon completion of the course, students should be able to: 1- Focus on engineering drawing along with their simples and terms as well as the standards 2- joining, bolts and gears, knowledge of assembly drawings. 3- how to use ACD in mechanical drawing 4- fits and tolerances.		
Indicative Contents	Indicative content includes the following. Application on computer, basic of engineering drawing with their simples and terms as well as their standards.[12hrs] using AutoCAD to draw an example of joining by bolts. [10 hrs] Classification of keys, pins and rivets. [10hrs] Application on computer, using AutoCAD to draw an example of joining of keys or pins. [10 hrs] Tolerances, basic size, limits of size and deviation. [10 hrs] Fits , classes of fit/ clearance. Transition. Interference. Calculation of fits & tolerance. [15 hrs] Assembly drawing using AutoCAD to draw general assembly. [10hrs]		

	Application on computer, using AutoCAD to draw an example of spur gear. [10 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, seminars, Practical testing and Online testing.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem)	87	**Structured SWL (h/w)**	8
Unstructured SWL (h/sem)	113	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	200		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	20% (20)	3,5,6,10	LO #1,2,…..10
	Assignments	2	10% (10)	7, 8	LO # 8
	Seminar	1	10% (10)	11	LO # 11
Summative assessment	**Midterm Exam**	2 hr	10% (10)	12	LO # 1-12
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) theoretical and practical
المنهاج الاسبوعي النظري والعملي محتوى كل اسبوع يجب ان يغطي الوقت المحدد

	Material Covered
Week 1	Symbols, expressions, general review
Week 2	Screws, bolts, studs and nuts, Keys.
Week 3	Screws, bolts, studs and nuts, Keys.
Week 4	pulleys
Week 5	Gears(bevel gear, warm gear, spur gear)
Week 6	Fit and tolerance
Week 7	Surface finishing and part tables
Week 8	Surface finishing and part tables

Week 9	Assembly drawing and working drawing for advanced mechanisms
Week 10	Assembly drawing and working drawing for advanced mechanisms
Week 11	Pipes and tubes
Week 12	Pipes and tubes
Week 13	Gears assembly
Week 14	Advanced machine assembly
Week 15	Advanced machine assembly

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Recommended Texts	➢ AutoCAD reference book	Yes

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

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	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	English 2			**Module Delivery**	
Module Type	S			☒ **Theory** ☐ **Lecture** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	MPAC208				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	2		**Semester of Delivery**	**2**	
Administering Department	BSc-MPAC		**College**	**Engineering**	
Module Leader	**Zainab Abd El Karim**		**e-mail**	zainab.abdelkarim@uowa.edu.iq	
Module Leader's Acad. Title	**Lecturer. Assist**		**Module Leader's Qualification**	**M.Sc**	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	15 / 10/2024		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MPAC104	**Semester**	L1,S1
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 goal is to study English language and gain knowledge of it as benefit engineers in general, and to develop speaking skills and understand its basic rules taking the way to the acquisition of the ability to use technical key words in their work and the capability of communicating with other engineers correctly
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Developing speaking skills and understanding its basic rules to take the way to the acquisition of the ability to use technical keywords in their work and the capability of communicating with other engineers correctly .
Indicative Contents المحتويات الإرشادية	Through the prepared syllabus, the student acquires the ability to understand grammar English language through weekly lectures and classes in a gradual and sequential manner for a period of four years, starting from the first stage, such as interrogative, negative, formation of sentences, parts of speech, and others.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	44	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	6	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6

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	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	20% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Revision, vocabulary and comprehension
Week 2	Present continuous, comparative and superlative adjective, vocabulary.
Week 3	Time clauses, this and that, vocabulary and comprehension.
Week 4	If clauses, vocabulary and comprehension
Week 5	This and that, expletive there, prepositions
Week 6	Past perfect, past perfect continuous , vocabulary and comprehension
Week 7	Relative pronouns, relative clauses
Week 8	Past perfect, Past perfect continuous, vocabulary and comprehension
Week 9	Used to, Infinitives, passive voice
Week 10	Passive voice, coordinating conjunctions, subordinating conjunction
Week 11	Future perfect, future perfect continuous, vocabulary and comprehension
Week 12	Writing a composition, comprehension
Week 13	Technical English (1), Keywords, English use
Week 14	**Revision**
Week 15	**Final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Headway plus for pre intermediate	Yes
Recommended Texts	Any Grammar and comprehension for technical learning	No
Websites		

Grading Scheme
مخطط الدرجات

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

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	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Fundamentals of Air Conditioning and Refrigeration**			**Module Delivery**	
Module Type	**C**			☐ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MPAC205**				
ECTS Credits	**13**				
SWL (hr/sem)	**300**				
Module Level	2		**Semester of Delivery**	2	
Administering Department	Refrigeration and Air Conditioning Techniques		**College**	Engineering	
Module Leader	Mohammed Hassan Abbood		**e-mail**	mohammed.hassan@mtu.edu.iq	
Module Leader's Acad. Title	Ass. Prof.Dr		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	15 / 10/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MPAC108	**Semester**	L1, S2
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Introduce the student to the basic processes of refrigeration and conditioning 2. Identifying the properties of air and the processes that take place on the moisture content of air. 3. Learn about the different cooling media and how to use their tables and curves. 4. Learn about the refrigeration compression system and its accessories
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- The student will be able to complete basic operations calculations on the content of moisture air content 2- The student will be able to determine the internal and external conditions for the design of the air conditioning system according to the conditions of human comfort. 3- The student will be able to complete all the operations of the compression refrigeration system, its components and accessories.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Air Conditioning The basic properties of a mixture of air and water vapor: components of atmospheric air, general equation of gases, Dalton's law of partial pressures, saturated vapor pressure, water vapor pressure in moist air, relative humidity, moisture content, humidification percentage, dew point, enthalpy, The psychometric scheme and adaptation processes: a general explanation of the psychometric chart and the basis for its construction. [15 hrs] Sensible cooling, sensible heating, dehumidification, humidification by water injection, adiabatic humidification, humidification efficiency, humidification by constant wet bulb temperature, contact factor, and bypass factor. [15 hrs]

	Humidification by steam injection, adiabatic air mixing, cooling, and dehumidification with reheating, preheating with humidification and reheat. [10 hrs] Air mixing and adiabatic humidification with reheating, summer cycle and winter cycle, practical applications for the case of summer, and practical applications for the case of winter. [15 hrs] Selection of supplied air conditions: removal of sensible heat, specific heat capacity of moisture air, removal of latent heat, inclination of the sensible heat ratio line, heat generated by fan motors, waste reheating, selection of appropriate air supply conditions [6 hrs] Part B – Refrigeration cycle Fundamentals Refrigerants, types of old and modern refrigerants, side effects of refrigerants on the ozone layer and global warming, secondary refrigerants, concept of refrigeration: uses of refrigeration and refrigeration methods, second law of thermodynamics, heat pump, reverse Carnot cycle, simple vapor compression cycle, simple vapor compression cycle parts.. [15 hrs] Mathematical analysis of the simple vapor compression cycle, the factors affecting the performance parameter of the vapor compression cycle (the impact of suction temperature, the impact of condensation temperature, the impact of sub-cooling, the impact of superheating, and the impact of pressure losses). Theoretical vapor compression cycle and its comparison with the real one, Improving the vapor compression cycle, Using flash tank, Supercooling of refrigerant.. [7 hrs] Multistage compression: flash gas removal, intercooler, one evaporator and one compressor, two evaporators and one compressor, two compressors and one evaporator. multi-stage compression: two compressors and evaporators, multi-stage compression with several types of inter-cooling (water intercooler, liquid flash intercooler, flash gas intercooler) [15 hrs] Vapor Compression refrigeration cycle components: compressors type, positive displacement compressors, reciprocating compressors, volumetric efficiency, mechanical efficiency, rotary compressors, screw compressors, scroll compressors,

	centrifugal compressors. Condensers, evaporators, and cooling towers Expansion tools, accessories for vapor compressor cooling system. [15 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	144	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	10
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	206	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	11
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	350		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	The basic properties of a mixture of air and water vapor: components of atmospheric air, general equation of gases, Dalton's law of partial pressures, saturated vapor pressure, water vapor pressure in moist air, relative humidity, moisture content, humidification percentage,

	dew point, enthalpy, The psychometric scheme and adaptation processes: a general explanation of the psychometric chart and the basis for its construction
Week 2	Sensible cooling, sensible heating, dehumidification, humidification by water injection, adiabatic humidification, humidification efficiency, humidification by constant wet bulb temperature, contact factor, and bypass factor.
Week 3	Humidification by steam injection, adiabatic air mixing, cooling and dehumidification with reheating, preheating with humidification and reheat.
Week 4	Air mixing and adiabatic humidification with reheating, summer cycle and winter cycle, practical applications for the case of summer, and practical applications for the case of winter.
Week 5	Comfort and internal conditions: Metabolism and human comfort, body mechanics in heat transfer and thermoregulation, metabolic rate, clothing, the effect of the environment on human comfort, other factors affecting human comfort, and selection of internal conditions.
Week 6	Climate and external conditions: climate, wind, local winds, dew formation, seasonal temperature change, seasonal humidity change, meteorological measurements, seasonal change of the psychometric condition of the external outdoor conditions, selection of external conditions (the three methods).
Week 7	Selection of supplied air conditions: removal of sensible heat, specific heat capacity of moisture air, removal of latent heat, inclination of the sensible heat ratio line, heat generated by fan motors, waste reheating, selection of appropriate air supply conditions
Week 8	Refrigerants, types of old and modern refrigerants, side effects of refrigerants on the ozone layer and global warming, secondary refrigerants, concept of refrigeration: uses of refrigeration and refrigeration methods, second law of thermodynamics, heat pump, reverse Carnot cycle, simple vapor compression cycle, simple vapor compression cycle parts.
Week 9	Mathematical analysis of the simple vapor compression cycle, the factors affecting the performance parameter of the vapor compression cycle (the impact of suction temperature, the impact of condensation temperature, the impact of sub-cooling, the impact of superheating, and the impact of pressure losses).
Week 10	Theoretical vapor compression cycle and its comparison with the real one, Improving the vapor compression cycle, Using flash tank, Supercooling of refrigerant.
Week 11	Multistage compression: flash gas removal, intercooler, one evaporator and one compressor, two evaporators and one compressor, two compressors and one evaporator.
Week 12	Multi-stage compression: two compressors and evaporators, multi-stage compression with several types of intercooling (water intercooler, liquid flash intercooler, flash gas intercooler)
Week 13	Vapor Compression refrigeration cycle components: compressors type, positive displacement compressors, reciprocating compressors, volumetric efficiency, mechanical

	efficiency, rotary compressors, screw compressors, scroll compressors, centrifugal compressors.
Week 14	Condensers, evaporators, and cooling towers
Week 15	Expansion tools, accessories for vapor compressor cooling system.
Week 16	**The preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Air velocity measuring devices - measuring air velocity using a Petot tube and a manometer.
Week 2	Applications to the air properties Psychometric Chart.
Week 3	Sensible cooling
Week 4	Sensible heating
Week 5	Dehumidification process
Week 6	Air Humidification by Direct Injection of Water Drops
Week 7	Humidify the air with a jet of steam
Week 8	Air mixing process
Week 9	Cooling and dehumidifying with reheating
Week 10	Preheating, cooling and dehumidifying with reheating
Week 11	Mixing and adiabatic saturation with reheating
Week 12	Theoretical calculations for compressor performance
Week 13	Condenser calculations for vapor compression cycle
Week 14	Calculations of capacity and performance factor for vapor compression cycle
Week 15	Calculations of the coefficient of performance for the real vapor compression cycle

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	***Jan F. Kreider, Peter S. Curtiss " Heating and cooling of Building" Mc Graw Hill, 2000*** ***ASHRAE, Fundamental . 1997.***	Yes

Recommended Texts	***Sapali, S.N., 2009."Refrigeration and air conditioning". PHI Learning Pvt. Ltd.***	No
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
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Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work is 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 Warith Al_Anbiyaa Engineering Department Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Ba'th regeem crimes**			**Module Delivery**	
Module Type	**S**			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MPAC204**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	2		**Semester of Delivery**	2	
Administering Department	Refrigeration and Air Conditioning Techniques		**College**	Engineering	
Module Leader	Musa Ali		**e-mail**	mousa.ali@uowa.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	M.SC	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	15-10-2024		**Version Number**		
Relation With Other Modules العالقة مع المواد الدراسية ألخرى					
Prerequisite module	None		**Semester**		

Co-requisites module	None	Semester	

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

Module Aims أهداف المادة الدراسية	تعريف الطلبة باهم جرائم نظام البعث في العراق التصدي للحملة الممنهجة التي تهدف الى التمجيد بنظام البعث المجرم وتلميع صورته. تسليط الضوء على انتهاكات البعث لحقوق الانسان. بيان حقاق الجرائم المرتكبة من قبل النظام البائد.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	دراسة اهم الجرائم المرتكبة من قبل نظام البعث - الكشف عن طبيعة النظام البعثي المجرم. - التركيز على الاليات المتبعة في ارتكاب الجرائم. -توضيح اثار جرائم النظام البائد على المجتمع العراقي
Indicative Contents المحتويات اإلرشادية	المحتويات اإلرشادية تتضمن ما يلي :- 1. مفهوم حقوق اإلنسان وخصائصه وفئاته .(2 ساعة) 2. حقوق اإلنسان في التاريخ والتراث اإلنساني (2 ساعة) 3. حقوق اإلنسان في ألديان السماوية و الحقوق المدنية(2 ساعة) 4. حظر اسلحة الدمار الشامل (2 ساعة) 5. الحقوق السياسية واالقتصادية واالجتماعية والثقافية(2 ساعة) 6. االنتخابات وحقوق اإلنسان(2 ساعة) 7. االعتراف الدولي بحقوق اإلنسان و المصادر القانونية لحقوق اإلنسان 8. المنظمات غير الحكومية ودورها في الدفاع عن حقوق اإلنسان(2 ساعة) 9. الديمقراطية وألنظمة السياسية (2 ساعة) 10.الديمقراطية في الحضارة اإلغريقية ومقارنتها بالديمقراطية الحديثة (2 ساعة) 11.مفاهيم عن الديمقراطية (2 ساعة) 12.أنواع الديمقراطية (2 ساعة) 13.العالقة بين حقوق االنسان والديمقراطية (2 ساعة) 14.ضمانات الحريات العامة (2 ساعة) 15.مراجعة عامة

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	يتم إعطاء المحاضرات بشكل القاء مباشر بالاضافة إلى مشاهدة مادة صورية أو فلمية مساعدة.

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خالل الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خالل الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خالل الفصل	50		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	20% (20)	3, 6, 9, 12	LO #1 - 5
	Assignments	2	10% (10)	5, 10	LO #1 - 5
	Projects / Lab.	-	-	-	-
	Report	1	10% (10)	13	LO #1 - 5
Summative assessment	**Midterm Exam**	1.5 hr	10% (10)	7	LO #1 - 5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج االسبوعي النظري

	Material Covered
Week 1	مقدمة في جرائم نظام البعث
Week 2	مفهوم الجرائم
Week 3	اقسام الجرائم
Week 4	الجريمة لغة واصطلاحًا
Week 5	أنواع الجرائم الدولية
Week 6	المحكمة الجنائية العليا
Week 7	اهم قرارات المحكمة الجنائية العليا
Week 8	الجرائم الاجتماعية والنفسية والبيئية
Week 9	اليات الجرائم النفسية والاجتماعية والبيئية
Week 10	اثار جرائم البعث المقبور

Week 11	انتهاك النظام البعثي للقوانين العراقية
Week 12	صور انتهاكات البعث لحقوق الانسان
Week 13	احداث الانتفاضة الشعبانية
Week 14	المقابر الجماعية
Week 15	احداث 1963-2003
Week 16	أسبوع تحضيري قبل االمتحان النهائي

Delivery Plan (Weekly Lab. Syllabus)
المنهاج السبوعي للمختبر

	Material Covered
Week 1	Exp. 1:
Week 2	Exp. 2:
Week 3	Exp. 3:
Week 4	Exp. 4:
Week 5	Exp. 5:
Week 6	Exp. 6:
Week 7	Exp. 7:

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	جرائم نظام البعث في العراق/ اعداد لجنة مختصة في وزارة التعليم العالي والبحث العلمي	Yes
Recommended Texts	١- ارشيف مؤسسة السجناء السياسيين ٢- ارشيف مؤسسة الشهداء ٣- ارشيف المركز العراقي لتوثيق جرائم التطرف في العتبة العباسية المقدسة ٤- سليم مطر / موسوعة البيئة العراقية ٥- حضارة وادي الرافدين رائد عبيس ود .عباس عطية / تقارير الامم المتحدة في ادانة نظام البعث	Yes

	بانتهاكات حقوق الانسان للمدة من 1991 م- 2003م ... . ومصادر اخرى	
Websites	- اية مواقع الكترونية	

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.