MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

HUMAN RIGHTS and DEMOCRACY حقوق الانسان والديمقراطية					
Module Title	**Democracy and Human Rights**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**NTU 100**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	**1**	**Semester of Deliver**	**1**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Shaima'a Salim Hameed**	**e-mail**	**Shamaaalobaidy@ntu.edu.iq**		
Module Leader's Acad. Title	**Assist lecturer.**	**Module Leader's Qualification**	**Ph.D.**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	23/9/2023	**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 Objectives أهداف المادة الدراسية	- زيادة معرفة الطالب بالجانب المفاهيمي النظري والتطور التاريخي لمادة حقوق الانسان والديمقراطية - تنمية مهارات الطالب التحليلية والنقدية فيما يتعلق بواقع ومستقبل حقوق الإنسان والديمقراطية - تدريب الطالب على أهمية المشاركة الفاعلة في جوانب الحياة العامة كتعزيز احترام مبادئ حقوق الإنسان العامة والمشاركة الفاعلة في الحياة السياسية والثقافية. - تمكين الطلاب من فهم أهمية التعليم ودوره في نشر ثقافة حقوق الإنسان والديمقراطية في بناء مجتمع حضاري يقوم على أساس الحكم الصالح الذي من أهم مقوماته الإيمان بحقوق الإنسان والتربية عليها والمشاركة الفاعلة في الحكم عبر الانتخابات الحرة والعادلة
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١. حقوق الإنسان ، تعريفها ، أهدافها ٢. حقوق الإنسان في التاريخ المعاصر والحديث ٣. الاعتراف الإقليمي بحقوق الإنسان ٤. حقوق الإنسان الحديثة ٥. ضمانات احترام وحماية حقوق الإنسان على الصعيد الوطني ٦. مصطلح الديمقراطية.

Indicative Contents المحتويات الإرشادية	١. حقوق الانسان ، تعريفها ، أهدافها حقوق الإنسان في الحضارات القديمة وخصوصا حضارة وادي الرافدين ضمانات واحترام وحماية حقوق الإنسان على الصعيد الدولي : - دور الأمم المتحدة ووكالاتها المتخصصة في توفير الضمانات - دور المنظمات الإقليمية (الجامعة العربية ، الاتحاد الأوروبي ، الاتحاد الافريقي ، منظمة الدول الأمريكية ، منظمة آسيان) . [15 hrs] دور المنظمات الدولية الاقليمية غير الحكومية والرأي العام في احترام وحماية حقوق الانسان ٢. مصطلح الديمقراطية ، نشأته، دلالته، تاريخ الديمقراطية. الأنظمة الديمقراطية في العالم/الديمقراطية في العالم الثالث/ المشاكل التي تواجه البلدان العربية في التحول الديمقراطي .[15 hrs]

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, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**30**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	٢
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**20**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	١
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	٥٠		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**3**	**٥% (15)**	**5 and ١٣**	**LO #٥, and #١٤**
	Assignments	**2**	**٥% (10)**	**6 and 12**	**LO#3 and #13**
	Projects / Lab.	**0**	**0% (0)**		
	Report	**2**	**5% (10)**	**4 and 11**	**Continues**
	SEMINAR	**1**	**٥% (5)**	**11**	**All**
Summative assessment	**Midterm Exam**	**2hr**	**10% (10)**	**7**	**LO #1 - #3**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

elivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	حقوق الإنسان ، تعريفها ، أهدافها حقوق الإنسان في الحضارات القديمة وخصوصا حضارة وادي الرافدين
Week 2	حقوق الانسان في الشرائع السماوية مع التركيز على حقوق الانسان في الاسلام
Week 3	حقوق الإنسان في التاريخ المعاصر والحديث : الاعتراف الدولي بحقوق الإنسان منذ الحرب العالمية الأولى وعصبة الامم المتحدة
Week 4	الاعتراف الإقليمي بحقوق الإنسان : الاتفاقية الاوربية لحقوق الانسان ١٩٥٠ ، الاتفاقية الامريكية لحقوق الانسان ١٩٦٩ ، الميثاق الافريقي لحقوق الانسان ١٩٨١ ، الميثاق العربي لحقوق الانسان ١٩٩٤
Week 5	حقوق الإنسان الحديثة : الحقائق في التنمية ، الحق في البيئة النظيفة ، الحق في التضامن ، الحق في الدين حقوق الانسان ، المنظمات الوطنية لحقوق الانسان)
Week 6	حقوق الإنسان في الدساتير العراقية بين النظرية والواقع
Week 7	**Mid-term Exam+** حقوق الإنسان الاقتصادية والاجتماعية والثقافية وحقوق الانسان المدنية والسياسية
Week 8	حقوق الإنسان الحديثة : الحقائق في التنمية ، الحق في البيئة النظيفة ، الحق في التضامن ، الحق في الدين
Week 9	ضمانات احترام وحماية حقوق الإنسان على الصعيد الوطني ، الضمانات في الدستور والقوانين الضمانات في الرقابة الدستورية ، الضمانات في حرية الصحافة والرأي العام ، دور المنظمات غير الحكومية في احترام وحماية حقوق الإنسان
Week 10	ضمانات واحترام وحماية حقوق الإنسان على الصعيد الدولي : - دور الأمم المتحدة ووكالاتها المتخصصة في توفير الضمانات - دور المنظمات الإقليمية (الجامعة العربية ، الاتحاد الأوروبي ، الاتحاد الافريقي ، منظمة الدول الأمريكية ، منظمة آسيان) دور المنظمات الدولية الإقليمية غير الحكومية والرأي العام في احترام وحماية حقوق الإنسان
Week 11	مصطلح الديمقراطية ، نشأته، دلالته، تاريخ الديمقراطية.
Week 12	الإسلام والديمقراطية ومساوئ الحكم الاستبدادي .
Week 13	الانتقادات الموجهة للديمقراطية، ومحاسن النظام الديمقراطي .
Week 14	الأنظمة الديمقراطية في العالم/الديمقراطية في العالم الثالث/ المشاكل التي تواجه البلدان العربية في التحول الديمقراطي
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	حقوق الإنسان والديمقراطية للدكتور محمد عابدالجابري ٢٠٠٦	Yes
Recommended Texts	حقوق الإنسان والديمقراطية اعداد أ.م.د. غسان كريم مجذاب و أ.م. امجد زين العابدين طعمة للعام ٢٠١٨	No
Websites	" طرق وتعليم وثقافة حقوق الانسان" ، منشور على شبكة المعلومات الدولية (الانترنت) على الموقع الالكتروني **http://ghrorg-learning.blogspot.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
	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.

Code	Course/Module Title	ECTS	Semester
NTU 100	**Human Rights & Democracy**	**2**	**1**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
2	**0**	**30**	**20**
Description			
مادة حقوق الإنسان والديمقراطية تقدم فهمًا شاملاً للمفاهيم والمبادئ الأساسية لحقوق الإنسان والنظم الديمقراطية. تركز المادة على دراسة القيم والمبادئ التي تحكم حقوق الإنسان وحمايتها، بالإضافة إلى فهم أهمية الديمقراطية في تنظيم الحكم وضمان مشاركة المواطنين في صنع القرارات. يتناول المقرر مواضيع مثل المساواة، وحرية التعبير، وحقوق المرأة والطفل، وحقوق الأقليات، وحقوق العمال واللاجئين، وأسس ومؤسسات الديمقراطية. تهدف المادة إلى تعزيز الوعي القانوني والأخلاقي بين الطلاب، وتمكينهم من فهم أهمية حقوق الإنسان والمشاركة الديمقراطية في بناء مجتمع عادل ومتقدم.			

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**English Language**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**NTU 101**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	**1**	**Semester of Deliver**	**1**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Shaima'a Salim Hameed**	**e-mail**	**Shamaaalobaidy@ntu.edu.iq**		
Module Leader's Acad. Title	**Assist. Lecturer**	**Module Leader's Qualification**	**M. Linguistics and English Language Teaching**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	**٢٣/٩/2023**	**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 Objectives أهداف المادة الدراسية	**1.** To develop problem solving skills mainly speaking, reading, writing and listening skills and to understand the English language as a foreign language through the application of many techniques. **2.** To understand the general principles of the English language. **3.** This course deals with the basic concepts of learning the main rules of English grammar and English vocabularies. **4.** This is the basic subject for writing and speaking English well. **5.** To understand how to build a correct English sentence.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1.** To recognize how to use the main and auxiliary verbs in addition to the possessive pronouns. **2.** To list the various words associated with questions and many subject pronouns. **3.** To talk about social expressions and personal information mainly about jobs by using affirmative, negative and interrogative sentences. **4.** To discuss how to use adjectives and their positions in the sentence. **5.** To construct the simple present sentence by using I/ we/ you and they and to define the articles. **6.** To describe the present simple tense with using he/ she and to discuss adverbs of frequency. **7.** To identify the basic question words and demonstrative pronouns and their applications. **8.** To discuss the use of there is/ are and many prepositions. **9.** To discuss the structure of simple past sentences and various irregular verbs. **10.** To explain the negative and interrogative structure of the simple past tense sentence in addition to the adverbs of the past tense. **11.** To identify the use of many adverbs and the use of can/ can't in the sentence and to explain requests and offers. **12.** To elaborate the use of like and would you like and the use of some and any in many expressions. **13.** To discuss the use of the present continuous and the difference between present simple and present continuous sentences. **14.** To explain the structures that are used to refer to future plants.
Indicative Contents المحتويات الإرشادية	1. An introduction to the importance of English language learning and the role it plays in social communication. 2. An application of various tenses like present and past tenses. 3. Demonstrating many main concepts including (offers, requests, future plants, personal expressions and tenses). 4. Using many skills to learn English like listening, reading, writing and speaking skills, moreover; presenting different examples to elaborate any concept or structure.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in this module is associated with the communicative approach which will be applied to develop students' skills to learn English and to enable students to use English in communication, therefore, using authentic materials in the class is so necessary. This approach is important to encourage students' participation in the class and to highlight their motivation in learning English, while at the same time refining and expanding their interactions and skills to achieve at least more success.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**30**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**(30/15)=2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**20**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**(20/15)=1**
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**	**٣**	**٥% (15)**	**4 , 11 and 13**	**LO #3, #10 and #12**
	Assignments	**2**	**٥% (١٠)**	**6 and 12**	**LO #5, and #11**
	Projects / Lab.				
	Report	**2**	**5% (10)**	**13**	**LO #5, #8 and #9 #10**
	Seminar	**1**	**٥% (5)**	**Continuous**	**All**
Summative assessment	**Midterm Exam**	**1hr**	**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	Unit one: Hello Am/are/is. May/your This is with practice in work
Week 2	Unit two: Your world He/she/they, his/her Questions
Week 3	Unit three: All about you Personal information/ social expressions
Week 4	Unit four: Family and friends Possessive adjectives/ possessive 's Have/has , adjective + noun
Week 5	Unit five: The way I live Present simple l/we/you/they An/a , adjective + noun
Week 6	Unit six: Every day Present simple he/she Negatives and questions, adverbs of frequency
Week 7	Unit seven: My favorites Question words, pronouns, this/that
Week 8	Unit eight: Where l live There is/ are, prepositions
Week 9	Unit nine: Times past Was/ were born, past simple and irregular verbs
Week 10	Unit ten: We had a great time Past simple, regular and irregular Questions, negatives, ago
Week 11	Unit eleven: l can do that! Can/can't, adverbs, requests

Week 12	Unit twelve: Please and thank you I'd like, some and any Like and would like
Week 13	Unit thirteen: Here and now Present continuous Present simple and present continuous
Week 14	Unit fourteen: It's time to go! Future plans, writing email and information letter
Week 15	**Revision**
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**John and liz Soar. (New Headway Beginner) 4th edition. Oxford: Oxford University Press.**	**Yes**
Recommended Texts	**"The Elements of Style" by William Strunk Jr. and E.B. White:** **This classic guide offers valuable advice on writing style and grammar, essential for clear and effective communication.** **"On Writing Well" by William Zinsser:** **Zinsser's book is a practical guide that covers different types of writing, including technical writing, and provides insights on improving clarity and precision.** **"Technical Communication: A Reader-Centered Approach" by Paul V. Anderson:**	**No**

	This book focuses specifically on technical communication, which is crucial for engineering students. It covers writing reports, manuals, and other technical documents.	
Websites	Purdue OWL (Online Writing Lab): Purdue OWL is a fantastic resource for writing and citation guidelines. It covers a wide range of topics, from general writing principles to specific guidelines for different citation styles. Grammarly: Grammarly is an online writing assistant that can help you improve your grammar, spelling, and overall writing style. It's a useful tool for both native and non-native English speakers. IEEE Author Center: If you're required to follow IEEE citation and writing style, the IEEE Author Center provides guidelines and resources for writing technical papers and articles.	

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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Code	Course/Module Title	ECTS	Semester
NTU 101	**English Language**	**2**	**1**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	**0**	٣٠	٢٠
Description			
This module will be used to develop problem solving skills mainly speaking, reading, writing and listening skills and to understand English language as a foreign language through the application of many techniques. It is also important to understand the general principles of English language. This			

course deals with the basic concepts of learning the main rules of English grammar and English vocabularies. It is mainly the basic subject for writing and speaking English well. The module is to understand how to build a correct English sentence. It contains various grammatical rules and different vocabularies with using typical examples to explain the structure and the meaning of any word or expression. The module is valid and reliable to deal with many recognizable situations and how to use English in different contexts associating with life experiences.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Principles of Mathematics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**TEMO 100**			☐ **Lecture**	
ECTS Credits	**7**			☐ **Lab**	
SWL (hr/sem)	**175**			☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	1		**Semester of Delivery**	**1**	
Administering Department	AM		**College**	**TEMO**	
Module Leader	RAID ABDULHADI ABDULQUADER		**e-mail**	**raid.alabdullah@ntu.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	**22/10/2023**		**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 Objectives	To let students be able to identify the advanced basic fundamentals in mathematics (differentiation and integration and their different applications) to develop their mentally capability by exercising solutions. Also can be able to correlate the information data in order to solve the scientific problem and how to make use of it in other scientific subjects.

أهداف المادة الدراسية	
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students are able to relate the significance of comprehending algebra's structure to a higher-level subject. 2. Within the parameters of the theory of modules, students have the ability to generate consciousness, particularly symbolic thinking. 3. Students are capable of using their understanding and analyzing models of mathematics, science, and technology, as well as other fields that are relevant to those disciplines. 4. Students are able to convey the outcomes of the growth of oral and writing comprehension as well as construct a framework for knowledge that supports mathematics, science, and technology.
Indicative Contents المحتويات الإرشادية	Subject-specific Knowledge: • knowledge of key ideas related to mathematics in the university • knowledge of the National Curriculum for mathematics and the way in which it facilitates the development of mathematical understanding • an understanding of the way in which theory informs practice and vice versa **Subject-specific Skills:** • an informed and critical awareness of research in mathematics education which can enhance the effectiveness of the university mathematics teacher • observe, record accurately and relate educational practice to theory in university and classrooms • critically analyzes literature on a variety of contemporary education issues relating to advanced mathematics **Key Skills:** • communicate ideas, principles and theories effectively in written form • manage time and work to deadlines • construct and sustain a reasoned argument • evaluate and make use of information from a variety of advance sources

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	To accommodate varied talents, skills, learning rates, and learning styles, teaching and learning strategies might involve a variety of whole class, group, and individual activities. This enables every student to engage and to some extent succeed.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	٦٧	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**4**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	١٠٨	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**7**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**5**	**3% (15)**	**5 , 7 and 13**	**LO #4, #6 and #12**
	Assignments	٥	**2% (10)**	**4 , 6 and 12**	**LO #5, #7 and #13**
	Projects / Lab.				
	Report	١	٥% (٥)	**14**	**LO # All**
	Onside Assignments	١	٥% (٥)		
	Seminars	**0**	**0% (0)**	**14**	**LO # All**
Summative assessment	**Midterm Exam**	**2hr**	**10% (10)**	**7**	**LO #1 - #8**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	To let students be able to identify the advanced basic fundamentals in mathematics (differentiation and integration and their different applications) to develop their mentally capability by exercising solutions. Also, can be able to correlate the information data in order to solve the scientific problem and how to make use of it in other scientific subjects.

Week 2	Trigonometric functions, trigonometric relations, graphic drawing, applications
Week 3	Limits of algebraic and trigonometric functions, limit near, applications
Week 4	Theory of derivatives, derivative of algebraic and trigonometric and empirical functions
Week 5	Chain rules, applications
Week 6	Inverse functions and inverse of trigonometric functions, applications
Week7	Derivatives of logarithmic and exponential functions, hyperbolic and its derivatives, relation and drawing, applications
Week 8	Integration theory, indefinite and definite integration, trigonometric and its inverse
Week 9	Integration of logarithmic and exponential functions, integration of hyperbolic functions, other integrations
Week 10	Methods of integrations, integration by parts
Week 11	Integration by partial fractions
Week 12	Area under a curve, area between two curves
Week 13	Volumes by revolutions, length of a curve
Week 14	Simple differential equations
Week 15	Approximate area by trapezoidal and Simpson rule, numerical integration, applications
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	" Calculus " , Ford , S.R. and Ford , J.R. , (1963) McGraw-Hill	Yes
Recommended Texts	“Principles of Mathematics”, Katherine A. Loop., (2015)	No
Websites	https://web.math.ucsb.edu/~agboola/teaching/2021/winter/122A/rudin.pdf	

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.

Code	Course/Module Title	ECTS	Semester
TEMO 100	**Principles of Mathematics**	**7**	**1**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	0	67	108

Description

Mathematics offers a potent and common language. When presenting mathematical ideas, arguments, and conclusions both orally and in writing, students are expected to employ acceptable mathematical terminology and a variety of representational techniques.

Students should be able to:

1. employ proper mathematical language (notation, symbols, and terminology) in both spoken and written explanations in order to achieve the goals of mathematics.

2. Present information using the proper mathematical representations.

3. choose between various mathematical representational styles.

4. Express thorough, clear, and simple mathematical arguments.

5. utilizes a logical structure to arrange information.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
Module Title	**Electrical Technology**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar** ☒ **lab**	
Module Code	**TEMO 101**				
ECTS Credits	٦				
SWL (hr/sem)	١٥٠				
Module Level	**1**		**Semester of Deliver**		**1**
Administering Department	**AM**		**College**	**TEMO**	
Module Leader	**Safwan Assaf Hamoodi** **The file (module description form of electrical and electronic engineering) prepared by Prof. Dr. Haitham M. Wadullah**		**e-mail**	**Safwan79azb@ntu.edu.iq** **dr.haitham@ntu.edu.iq**	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	23/9/2023		**Version Number**	**1.0**	

Relation with other Modules			
Prerequisite module	**None**	**Semester**	
Co-requisites module	**None**	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Preparing the student to study the different calculations in alternating current and direct current circuits, and to get acquainted with the various theories to study these calculations. Understanding electrical principles and concepts: The module aims to provide students with a clear understanding of electrical principles and concepts, including voltage, current, resistance, and power. Students will learn how these concepts are applied in electrical circuits and systems. Developing practical skills in electrical measurements and testing: The module aims to equip students with practical skills in using electrical instruments and equipment for

	measurements and testing. Students will learn how to perform accurate measurements, interpret the results, and troubleshoot electrical systems. Applying knowledge to electrical machines and power systems: The module aims to enable students to apply their knowledge of electrical technology to the operation and maintenance of electrical machines, such as motors and generators. Students will also gain an understanding of power systems and their components, including power generation, transmission, and distribution.
Module Learning Outcomes	1. Understanding electrical circuit theory: Students will gain knowledge of fundamental electrical circuit theory, including concepts such as voltage, current, resistance, and power. They will be able to apply this understanding to analyze and solve basic electrical circuits. 2. Proficiency in electrical measurements and testing: Students will develop skills in using electrical instruments and equipment to measure and test electrical parameters. They will learn how to interpret measurement results and troubleshoot electrical systems to identify faults. 3. Application of electrical machines and power systems: Students will learn about electrical machines, such as motors and generators, and their operating principles. They will understand the characteristics and applications of these machines. Additionally, they will gain a basic understanding of power systems, including power generation, transmission, and distribution.
Indicative Contents	**Part A -** **1.** Basic Electrical Principles, Electrical Measurements and Instruments [20 hrs] **2.** Electrical Machines, Power Systems, Electrical Safety, Direct current circuit [20 hrs] **3.** Revision and quiz [1.5 hrs] Part B – **1.** Alternating current circuit, Circuit Theory, Analogue Electronics Control Systems [20 hrs] **2.** Renewable Energy, Troubleshooting and Maintenance [10 hrs] **3.** Revision and quiz [1.5 hrs]

Learning and Teaching Strategies	
Strategies	**1.** Active Engagement: Actively engage with the subject matter by participating in class discussions **2.** Practice Problem Solving: Electrical Technology involves problem-solving skills. **3.** Hands-on Experience: Gain practical experience by participating in laboratory sessions and hands-on projects. **4.** Collaborative Learning: Engage in group discussions and study sessions with classmates. **5.** Utilize Resources: Take advantage of resources such as textbooks, online tutorials, video lectures, and educational websites to supplement your learning. **6.** Time Management: Create a study schedule and allocate dedicated time for studying Electrical Technology. **7.** Review and Recap: Regularly review previously covered topics to reinforce your understanding and retain information.

Student Workload (SWL)			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**93**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**6**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**57**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**4**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**2**	**10% (10)**	**5 and 10**	**LO #1and #2**
	Assignments	**2**	**5% (5)**	**2 and 12**	**LO #2 and #3**
	Projects / Lab.	**9**	**15% (15)**	**Continuous**	**LO #1 and #3**
	Report	**1**	**10% (10)**	**13**	**LO #3**
Summative assessment	**Midterm Exam**	**2hr.**	**10% (10)**	**7**	**LO #1 - #2**
	Final Exam	**2hr.**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Symbols and abbreviations, electric circuit and its elements
Week 2	The direct-current network (kerchief's law & their use in network analysis
Week 3	Conversion of delta-connected resistance into an equivalent Wye connection & vice versa
Week 4	Power sources connected in parallel, node voltage method
Week 5	Loop current method.

Week 6	Super position method.
Week 7	Thevenin's theorem and Norton's theorem.
Week 8	Maximum power transfer.
Week 9	Reciprocity theorem
Week 10	Sinusoidal excitation, average, effective values and their steady- state analysis
Week 11	Generation of alternating current, sinusoidal current
Week 12	The mean values of current and voltage
Week 13	Complex Frequency, s-Plane, Poles and Zeros, Response Function, Bode Plots
Week 14	Frequency Response of Series/Parallel Resonances, High-Q Circuits
Week 15	Mutual Inductance, Linear and Ideal Transformers, Circuits with Mutual Inductance
Week 16	Final Examination

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Lab 1: : Introduction to Agilent VEE and PSPICE
Week 2	Lab 2: Kirchhoff's Laws
Week 3	Lab 3: series circuit
Week 4	Lab 4: Parallel circuit
Week 5	Lab 5: Thévenin's Theorem.
Week 6	Lab 6: Norton's Theorem.
Week 7	Lab 7: Y-connection delta-connection
Week 8	Lab 8: Second-Order Transient Responses
Week 9	Lab 9: Frequency Response of RC Circuits
Week 11	Lab 10: Frequency Response of RLC Circuits
Week 12	Lab 11: Filters
Week 13	Lab 12: AC circuit
Week 14	Lab 13: sine wave form
Week 15	Lab 14: Review

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	1. **"Electric Machinery and Power System Fundamentals" by Stephen J. Chapman** 2. **"Electricity and Electronics for HVAC" by Rex Miller and Mark R. Miller** 3. **"Principles of Electric Machines and Power Electronics" by P.C. Sen** 4. **"Electrical Power Systems: Design and Analysis" by Mohamed E. El-Hawary**	
Recommended Texts	1. **"Electrical Wiring Residential" by Ray C. Mullin and Phil Simmons** 2. **"Industrial Electrical Troubleshooting" by Lynn Lundquist** 3. **"Electrical Safety Handbook" by John Cadick, Mary Capelli - Schellpfeffer, and Dennis Neitzel** 4. **"Digital Control Systems" by Benjamin C. Kuo** 5. **"Electromechanical Energy Conversion" by David J. Braun**	

Websites	(www.allaboutcircuits.com) (www.electrical4u.com) (www.khanacademy.org)

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.

Code	**Course/Module Title**	**ECTS**	**Semester**
TEMO 101	**Electrical technology**	**٦**	**1**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**

3	**3**	**93**	٥٧

Description

Electrical technology encompasses the study of electrical systems, circuits, devices, and their applications. It focuses on understanding the principles and theories behind electricity, electrical power generation, transmission, and distribution. This field involves the design, installation, maintenance, and troubleshooting of electrical systems in various industries, such as power generation, manufacturing, telecommunications, and transportation. Electrical technology professionals work with electrical equipment, control systems, and renewable energy technologies. They are skilled in analyzing electrical circuits, performing measurements, and ensuring safety and compliance with electrical codes and standards. A strong foundation in electrical technology enables individuals to contribute to the development and advancement of electrical systems, energy efficiency, and the integration of new technologies in the field.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Workshop**			**Module Delivery**	
Module Type	**Core**			☐**Theory**	
Module Code	**TEMO 102**			☐**Lecture**	
ECTS Credits	**6**			☒ **Lab**	
SWL (hr/sem)	**150**			☐ **Tutorial**	
				☒ **Practical**	
				☐ **Seminar**	
Module Level	**1**	**Semester of Deliver**		**1**	
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Ali Hussien**	**e-mail**	**alimohallami@ntu.edu.iq**		
Module Leader's Acad. Title		**Module Leader's Qualification**	**M.Sc.**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	23/9/2023	**Version Number**	**1.0**		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	**1.** Teach students the basic principles of the workshop. **2.** Identify the tools used. **3.** Training students on the operations of a process. **4.** Teaching students about the electrical and mechanical parts of devices.

	5. Learn about the types of furnaces for melting metals, and how to pour molten metal into sand molds. 6. Identify the types of filings and their shapes. 7. Learn about all types of lathes and how to use them. 8. Learn how to deal with sheet metal. 9. Learn about the most important methods of welding and the machines and tools needed for that. 10. Learn about the most important tools and machines for dealing with wood, in addition to identifying the most popular and common types of wood.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**توفر ورشة العمل في كلية الهندسة للطلاب فرصة قيمة لاكتساب المعرفة والمهارات العملية في مجالات هندسية محددة. وتهدف الورشة إلى تعزيز تطبيق المفاهيم النظرية المستفادة في الفصول الدراسية وتوفير بيئة تعليمية تفاعلية. ويشمل جلسات تعليمية وتمارين عملية وحل المشكلات ومشاريع التطبيق العملي. يتعاون الطلاب في فرق لتحقيق أهداف محددة وتطوير مشاريع فعالة. تعزز ورشة العمل التواصل والتعاون بين الطلاب، وتشجع التفكير النقدي وحل المشكلات في بيئة محاكاة هندسية. وتعد ورشة العمل فرصة قيمة للطلاب لتطوير مهاراتهم الفنية والعملية وتعزيز قدراتهم الهندسية للمستقبل.**
Indicative Contents المحتويات الإرشادية	**يتم في كل ورشة من هذه الورش عمل تمرين او اكثر (بحسب ماهو متاح من اجهزة وعدد ومواد) ، حيث يتدرب الطالب على السباكة ولخراطة والباردة والنجارة واللحام عمليا من خلال التدريب ثم الممارسة لاكتساب الخبرة والمهارة**

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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**108**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**7**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**٤٢**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**٣**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**١٥٠**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**2**	**2.5(5)**	**3,5**	**all**
	Assignments	**2**	**2.5(5)**	**6,9**	**all**
	Projects / Lab.	**4**	**5% (10)**	**Continuous**	**All**
	Report	**2**	**5% (30)**	**Continuous**	**All**
Summative assessment	**Midterm Exam**	**2hr**	**10% (10)**	**7**	**LO #1 - #6**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري والعملي	
	Material Covered
Week 1	**١ .ورشة السباكة : يتم فيها التعرف على انواع الافران الخاصة بصهر المعادن وكيفية صب المعدن المصهور في قوالب الرمل والتعرف على نوع الرمل المستخدم في صب القوالب اضافة الى كيفية التعامل مع القالب وتثبيته بالرمل وكيفية اخراجه م الرمل**
Week 2	
Week 3	**٢ .ورشة البرادة : يتم فيها التعرف على انواع المبارد واشكالها وكيفية العمل بكل نوع من المبارد وكيف يتم اختياره وفقا لنوع المادة التي يتم العمل عليها**
Week 4	

Week 5	٣ .ورشة الخراطة : يتم فيها التعرف على اهم اجهزة خراطة وكشط وتثقيب الاجزاء المراد تشكيلها بواسطة كل من المكائن التالية التورنة الفريزة القاشطة انواع المزارف ويتم التعرف على كل ماكنة من هولاء المكائن والاجزاء الرئيسية لكل ماكنة وكيفية عملها
Week 6	
Week 7	
Week 8	٤ .ورشة السمكرة : يتم فيها التعرف على كيفية التعامل مع صفائح المعادن من حيث القص والطرق والتثقيب والثني والتحديب واهم العدد اللازمة لذلك وكيفية العمل بها
Week 9	
Week 10	٥ .ورشة اللحام : التعرف على اهم طرق اللحام والمكائن والعدد اللازمة لذلك وكيف يتم اختيار المعدن الملائم لاجراء عملية اللحام وسمكه وكيفية العمل بكل طريقة من طرق اللحام والمتضمنة لحام القوس الكهربائي لحام النقطة اللحام بالاحتكاك اللحام الغازي
Week 11	
Week 12	
Week 13	٦ .النجارة : يتم فيها التعرف على اهم العدد والمكائن الخاصة بالتعامل مع الخشب اضافة الى التعرف على اشهر انواع الاخشاب والاكثرها شيوعا وكيف يتم التعامل مع العروق التركيب النسيجي للوح الخشب عن طريق العدد
Week 14	
Week 15	عمل تجريبي على جميع الورش
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		**Yes**
Recommended Texts		**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

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.

Code	Course/Module Title	ECTS	Semester
TEMO 102	**WORKSHOP**	**6**	**1**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
0	**6**	**93**	**57**

The workshop in an engineering college provides students with a valuable opportunity to acquire knowledge and practical skills in specific engineering fields. The workshop aims to enhance the application of theoretical concepts learned in classrooms and provides an interactive learning environment. It includes instructional sessions, hands-on exercises, problem-solving, and practical application projects. Students collaborate in teams to achieve specific goals and develop effective projects. The workshop promotes communication and

collaboration among students, encourages critical thinking, and problem-solving in an engineering simulation environment. The workshop is a valuable chance for students to develop their technical and practical skills and enhance their engineering capabilities for the future.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mechanics Engineering / Statics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**AM 100**				
ECTS Credits	**7**				
SWL (hr/sem)	**200**				
Module Level	**1**	**Semester of Delivery**	**1**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Tariq Khalid**	**e-mail**	**tariqaikhalidi@ntu.edu.iq**		
Module Leader's Acad. Title	**Assist. Professor**	**Module Leader's Qualification**	**MASTER**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	June /01/2023	**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 Learning Outcomes مخرجات التعلم للمادة الدراسية	**1.** Apply fundamental concepts of engineering mechanics/statics to analyze and solve problems related to the equilibrium of rigid bodies. **2.** Demonstrate a deep understanding of vector mathematics and its application in statics, including vector addition, subtraction, dot product, and cross product. **3.** Apply the principles of static equilibrium to solve problems involving forces and moments acting on rigid bodies in two and three dimensions. **4.** Analyze and calculate the internal forces, such as axial forces, shear forces, and bending moments, in statically determinate structures using methods such as the method of sections and the method of joints. **5.** Utilize free-body diagrams to model and analyze the forces acting on a structure or a rigid body, and determine the resultant forces and moments at specific points. **6.** Analyze and calculate the centroid and moment of inertia of various two-dimensional shapes, including rectangles, triangles, and circles, and apply these concepts to determine the stability and strength of structures. **7.** Apply the concepts of friction and its effects on the equilibrium of bodies in statics, including calculating static and kinetic friction forces and determining the angle of friction. **8.** Analyze and calculate the forces in trusses and frames, including the method of joints and the method of sections, and determine the stability and structural integrity of these systems. **9.** Apply the principles of equilibrium to solve real-world engineering problems, such as determining the stability of structures, calculating the forces on supports and connections, and analyzing the behavior of mechanical systems. **10.** Communicate effectively, both orally and in writing, to present and explain the analysis, results, and solutions of engineering mechanics/statics problems. By achieving these module learning outcomes, students will develop a strong foundation in engineering mechanics/statics and be equipped with the necessary knowledge and skills to analyze and solve a wide range of engineering problems involving static equilibrium and structural stability.
Indicative	Indicative content includes the following.

Contents

المحتويات الإرشادية

1. Introduction to Statics
    - Definition and scope of statics
    - Fundamental concepts and principles
    - Importance of statics in engineering
2. Vectors and Vector Analysis
    - Vector representation and operations
    - Vector components and coordinate systems
    - Vector addition, subtraction, and scalar multiplication
3. Forces and Moments
    - Forces and their characteristics
    - Resultant and equilibrium of forces
    - Moment of a force and its properties
    - Couples and their effects
4. Equilibrium of Rigid Bodies
    - Free body diagrams and force analysis
    - Equations of equilibrium in two and three dimensions
    - Solving equilibrium problems using scalar and vector approaches
    - Applications to simple systems and structures
5. Truss Structures
    - Introduction to truss analysis
    - Method of joints and method of sections
    - Determination of member forces and support reactions
6. Friction
    - Laws of friction and frictional forces
    - Types of friction and their characteristics
    - Calculation of frictional forces and moments
    - Applications to inclined planes, wedges, and screws

	7. Center of Gravity and Centroids • Definitions and properties of center of gravity and centroids • Determination of center of gravity and centroids of simple shapes • Composite bodies and distributed loads **8.** Moments of Inertia • Moment of inertia and its physical significance • Calculating moments of inertia for simple shapes • Parallel-axis and perpendicular-axis theorems • Application of moments of inertia in engineering analysis

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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**63**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**5**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**112**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**6**
Total SWL (h/sem)	**175**		

الحمل الدراسي الكلي للطالب خلال الفصل	

Module Evaluation تقييم المادة الدراسية					
As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**4**	**25% (25)**	**5,7,9 and 13**	**LO #2 , #3 , #5 and #8**
	Assignments	**2**	**5% (5)**	**2, 10**	**LO #1 ,#4 ,#6 ,#7 and #9**
	Projects / Lab.				
	Report	**1**	**5% (5)**	**13**	**LO #5, #8 and #10**
Summative assessment	**Midterm Exam**	**2hr**	**15% (15)**	**7**	**LO #1 - #5**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Course 1 Material Covered
Week 1	**Introduction, Fundamental Concepts,**
Week 2	**Units of Measurement , SI Units, U.S. Customary , Prefixes , Units Conversion**
Week 3	**Force Vectors : Scalar and Vector Quantities**
Week 4	**Resultant force: Resolution & Composition of Forces**
Week 5	**Resultant force: Triangle & parallelogram law,**
Week 6	**Resultant force: Graphical Method**

Week 7-8	**Addition of a System of Coplanar Forces: Scalar Notation, Cartesian Vector Notation**
Week 9-10	**Equilibrium of a Particle: Condition for the Equilibrium of a Particle, The Free-Body Diagram, Coplanar Force Systems**
Week 11-13	**Moment of a Force, Varignon Theorem.**
Week 14	**Moment of a Couple**
Week 15	**Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Engineering Mechanics/ Statics, Fourteen Edition, R.C. Hibbeler**	**yes**
Recommended Texts	**1- Engineering Mechanics , Ferdinand L. Singer** **2- Engineering Mechanics, Meriam** **3- Engineering Mechanics/ Statics, Arthur P. Boresi & Richard J. Schmidt**	**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	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
(0 – 49)	**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.

Code	Course/Module Title	ECTS	Semester
AM 100	Mechanics Engineering / Static	8	1
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
3	3	93	107

Description

Statics, is a fundamental branch of Engineering Mechanics that deals with the analysis and prediction of the behavior of objects at rest or in equilibrium. It provides the foundation for understanding the principles of forces, moments, and their effects on structures and systems. This branch of engineering mechanics is primarily concerned with the study of particles and rigid bodies under the action of forces and moments.

One of the main objectives of Engineering Mechanics/Statics is to enable engineers to calculate and predict the behavior of structures and systems under different loading conditions. This includes understanding the concepts of force vectors, moments, and couples, as well as the methods for resolving and combining these forces to determine their resultant effects.

Through theoretical study, problem-solving, and practical applications, students of Engineering Mechanics/Statics develop critical skills in analyzing and solving engineering problems. They learn to apply mathematical principles, physics, and engineering concepts to determine the forces and moments in structures and systems, and to ensure their stability and safety.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer**			**Module Delivery**	
Module Type	**support**			☒ **Theory**	
Module Code	**NTU 102**			☐ **Lecture**	
ECTS Credits	**3**			☒ **Lab**	
SWL (hr/sem)	**75**			☒ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Level	**1**		**Semester of Deliver**		**2**
Administering Department	**AM**		**College**		**TEMO**
Module Leader	**Luluwah abdulwahaab Yaseen**		**e-mail**		**luluwah.alhubaity@ntu.edu.iq**
Module Leader's Acad. Title	**Asst. Lecturer**		**Module Leader's Qualification**		**M.S.C.**
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	**٢٣/٩/2023**		**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 Objectives أهداف المادة الدراسية	1. To learn about computers and their characteristics and features, compare different types of computers. 2. To learn about the computer's Hardware, Identify the factors that affect the computer's performance, Learn about the numerical systems and data representation.

	3. Learn about the computer's Hardware(2), CPU, Memory 4. Learn about operating system software 5. Learn about the utility software programming languages, application software. 6. Learn the Microsoft office2020(Word, Excel, PowerPoint)
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrates knowledge of the Introduction to computer, computer component (hardware, software) 2. Demonstrates knowledge of the Operating system (windows), 3. Able to install windows (formatting) 4. Able to use the following items: Start menu, desktop, taskbar, mouse applications, My computer, My documents, drivers, folders, files, cut, copy, paste, shortcut, right click menu, Setting menu, control panel 5. Able to use Microsoft word 2020, Microsoft excel 2020, Microsoft powerpoint 2020 6. Able to use Internet , Internet explorer, starting, menus of internet explorer, E-Mail: Yahoo, Hotmail, google, yahoo, search information
Indicative Contents المحتويات الإرشادية	After studying this chapter, the student is expected to master the following knowledge and skills: 1. To know what is the computer, distinguish different computer properties, list the computers features and capabilities, compare between the different types of computers [11 hrs] 2. Classifies the computer's hardware components to internal and external [11 hrs] 3. To knows the CPU, types of memory modules, learn about input and output units, Learn about storage media, learn the components of the motherboard [11 hrs] 4. Distinguish between different types of software, differentiate between types of system software, distinguish between types of operating systems, count the basic functions of the operating system.[12 hrs] 5. Learn about different types of utility software, learn about the most important utility software and its functions, distinguish between different types of programming languages, differentiate between the types of different programming languages Compilers, classifies different programming languages, classifies application software, learn about the most important application software [12 hrs] 6. Learn to use the Microsoft office2020 [15hrs] • Word [5 hrs] • Excel [5 hrs] • Powerpoint [5 hrs] • Revision and quiz [8hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. This will be accomplished through lectures, interactive tutorials, and the consideration of various sorts of easy experiments incorporating some engaging sampling exercises for the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**5**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**5**
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**	**3**	**10% (10)**	**3,8 and 12**	**LO #1, #2,#4,#5 and #6**
	Assignments	**4**	**10% (10)**	**2,5,10 and 14**	**LO #1, #4,#5 and #6**
	Projects / Lab.	**3**	**20% (20)**	**Continuous**	**All**
	Report				
Summative assessment	**Midterm Exam**	**2hr**	**10% (10)**	**7**	**LO #1 - #3**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Demonstrates knowledge of the Introduction to computer, computer component (hardware, software)
Week 2	• Demonstrates knowledge of the Operating system (windows), • Able to install windows (formatting)
Week 3 &4	Able to use the following items: Start menu, desktop, taskbar, mouse applications, My computer, My documents, drivers, folders, files, cut, copy, paste, shortcut, right click menu, Setting menu, control panel
Week 5&6	Able to use Microsoft word 2020
Week 7& 8& 9	Able to use Microsoft excel 2020
Week 10&11	Able to use Microsoft power point 2020
Week 12	Able to use Internet , Internet explorer, starting, menus of internet explorer
Week 13	Able to create and use E-Mail: Yahoo, Hotmail
Week 14	• Able to utilize Search engines • Able to use google, yahoo, search information
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1- 6	Able to use Microsoft word 2020
Week 7 – 9	Able to use Microsoft excel 2020
Week 10 -11	Able to use Microsoft PowerPoint 2020

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Introduction to Computer Skills **For first year students, Bisha University** Computer Science Principles: The Foundational Concepts of Computer Science - For AP® Computer Science Principles 2020th Edition , Mr. Kevin P Hare (Author), Pindar Van Arman (Foreword)	Yes
Recommended Texts	MICROSOFT ACCESS, EXCEL & POWER BI FOR BEGINNERS & POWER USERS, Tech Demystified (Author)	No
Websites	https://www.just.edu.jo/~mqais/CIS99/PDF/Ch.01_Introduction_%20to_computers.pdf	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group	**A** - Excellent	امتياز	90 - 100	Outstanding Performance

(50 - 100)	**B** - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
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(0 – 49)	**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.

Code	Course/Module Title	ECTS	Semester
NTU 102	**COMPUTER PRINCIPLES**	**6**	**2**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	**4**	**78**	**72**
Description			
Computer Principles is an introductory course that provides a comprehensive understanding of the fundamental concepts and principles of computer science. The course covers topics such as computer architecture, data representation, algorithms, programming languages, operating systems, and computer networks. Students will learn about the basic components of a computer system, how data is stored and processed, and the principles behind efficient and reliable computer operations. The course also explores			

the role of computers in society, ethical considerations in computing, and emerging trends in the field. Through this course, students will develop a solid foundation in computer principles and gain the necessary skills to pursue further studies or careers in computer science

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information					
Module Title	**Arabic Language**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory**	
Module Code	**NTU 103**			☐ **Lecture**	
ECTS Credits	**2**			☐ **Tutorial**	
SWL (hr/sem)	**50**			☐ **Practical**	
				☐ **Seminar**	
Module Level	**1**	**Semester of Deliver**		**2**	
Administering Department	**AM**	**College**		**TEMO**	
Module Leader	**Shaimaa Salem Hameed**	**e-mail**		**Shaima.salem@ntu.edu.iq**	
Module Leader's Acad. Title	**Assist Lect.**	**Module Leader's Qualification**		**M.Sc.**	
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	**23/9/2023**	**Version Number**		**1.0**	

Relation with other Modules			
Prerequisite module	**None**	**Semester**	
Co-requisites module	**None**	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	**١. تعزيز التواصل الفعال: يهدف تعلم اللغة العربية إلى تمكين الطلاب من التواصل بشكل فعال في البيئة العربية، سواء كان ذلك في الحياة اليومية أو في السياق الأكاديمي والعملي.** **٢. فهم الثقافة العربية: يعتبر تعلم اللغة العربية مفتاحًا لفهم الثقافة العربية وقيمها، ويساعد الطلاب على التعرف على التراث العربي الغني وفهم تعدد الثقافات في العالم العربي.** **٣. تعزيز القدرات البحثية والأكاديمية: تعلم اللغة العربية يساهم في تطوير مهارات البحث والكتابة الأكاديمية للطلاب، مما يمكنهم من المشاركة بفاعلية في النقاشات الأكاديمية وإنتاج المعرفة.** **٤. توفير فرص وظيفية: يعتبر إتقان اللغة العربية مهارة قيمة في سوق العمل، حيث يمكن للطلاب العربية العمل في مجالات متعددة مثل الترجمة، الإعلام، العلاقات العامة، والتعليم.** **1.** Enhancing effective communication: Teaching Arabic aims to enable students to communicate effectively in the Arab environment, both in daily life and in academic and professional contexts. **2.** Understanding Arab culture: Learning Arabic is a key to understanding Arab culture and its values, helping students to explore the rich Arab heritage and comprehend the cultural diversity within the Arab world. **3.** Enhancing research and academic skills: Learning Arabic contributes to developing research and academic writing skills for students, enabling them to actively participate in academic discussions and contribute to knowledge production. **4.** Providing job opportunities: Proficiency in Arabic is a valuable skill in the job market, allowing students to .
Module Learning Outcomes	١. القدرة على التواصل الفعال: يكتسب الطلاب مهارات الاستماع والتحدث والقراءة والكتابة في اللغة العربية، مما يمكنهم من التواصل بطلاقة وفهم المحتوى بشكل صحيح. ٢. القدرة على فهم النصوص والثقافة: يتعلم الطلاب قراءة وفهم النصوص الأدبية والثقافية باللغة العربية، مما يساهم في تطوير فهمهم للتراث العربي والتحليل النقدي للأعمال الأدبية. ٣. القدرة على البحث والكتابة الأكاديمية: يتعلم الطلاب كيفية إجراء البحوث والكتابة الأكاديمية باللغة العربية، ويتمكنون من تقديم أوراق بحثية وتقارير أكاديمية بشكل متميز. ٤. التفاعل الثقافي والاجتماعي: يتمكن الطلاب من المشاركة في المجتمع العربي بشكل أعمق وفهم التقاليد والقيم والعادات المحلية، مما يعزز التفاهم الثقافي والتعايش السلمي. 1. Effective communication skills: Students acquire listening, speaking, reading, and writing skills in Arabic, enabling them to communicate fluently and understand content accurately. 2. Understanding texts and culture: Students learn to read and comprehend literary and cultural texts in Arabic, enhancing their understanding of Arab heritage and

	developing critical analysis of literary works. 3. Research and academic writing abilities: Students learn how to conduct research and engage in academic writing in Arabic, enabling them to present research papers and academic reports effectively. 4. Cultural and social interaction: Students are able to actively participate in the Arab community, gaining a deeper understanding of local traditions, values, and customs, fostering cultural understanding and peaceful coexistence.
Indicative Contents	١. مقدمة في المحتويات الإشارية: تعريف المحتويات الإشارية وأهميتها، ودورها في مجالات وتخصصات متنوعة. ٢. أنواع وصيغ المحتويات الإشارية: استكشاف مختلف أنواع وصيغ المحتويات الإشارية، مثل الجداول والرسوم البيانية والنقاط البارزة والملخصات. ٣. إنشاء المحتويات الإشارية: تقنيات واستراتيجيات إنشاء المحتويات الإشارية الفعالة، بما في ذلك اختيار المعلومات الرئيسية، وتبسيط المفاهيم المعقدة، وتنظيم المحتوى لسهولة الفهم. ٤. التمثيل البصري للمحتويات الإشارية: استخدام الوسائط البصرية، مثل الرسوم البيانية والمخططات والرسومات، لتقديم المحتويات الإشارية بشكل جذاب ومفيد بصريًا. ٥. أمثلة ودراسات الحالة: تحليل أمثلة ودراسات حالة حقيقية لفهم كيفية استخدام المحتويات الإشارية في سياقات مختلفة، مثل التقارير البحثية ومواد التسويق والموارد التعليمية. 1. Introduction to Indicative Contents: Defining indicative contents and understanding their significance in various fields and disciplines. 2. Types and Formats of Indicative Contents: Exploring different types and formats of indicative contents, such as tables, charts, bullet points, and summaries. 3. Creating Indicative Contents: Techniques and strategies for effectively creating indicative contents, including selecting key information, simplifying complex concepts, and organizing content for easy comprehension. 4. Visual Representation of Indicative Contents: Utilizing visual aids, such as infographics, diagrams, and illustrations, to present indicative contents in an engaging and informative manner. 5. Examples and Case Studies: Analyzing real-life examples and case studies to understand how indicative contents are used in various contexts, such as research reports, marketing materials, and educational resources.

Learning and Teaching Strategies	
Strategies	1. Interactive Language Activities: Engaging students in interactive activities such as role-plays, group discussions, and language games to practice and reinforce language skills. 2. Communicative Approach: Emphasizing real-life communication and providing opportunities for students to actively engage in speaking, listening, reading, and writing tasks to develop their language proficiency. 3. Authentic Materials: Incorporating authentic materials such as newspaper articles, songs, videos, and literature to expose students to real-world language usage and cultural contexts

Student Workload (SWL)			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**32**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**(32/15)=2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**18**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**(18/15)=1**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**4**	**30% (30)**	**3,6,10 and 14**	**LO #1, #2 , #3, and #4**
	Assignments	**2**	**10% (10)**	**4 and 12**	**LO #1and #4**
	Projects / Lab.		**0% (0)**	**0**	**0**
	Report		**0% (0)**	**0**	**0**
Summative assessment	**Midterm Exam**	**1hr.**	**10% (10)**	**7**	**LO #1 - #2**
	Final Exam	**2hr.**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus)		
	Material Covered	
Week 1	مقدمة عن الأخطاء اللغوية	Introduction to Language Errors:
Week 2	التاء المربوطة والتاء المفتوحة	Taa Marbuta and Taa Marbuta (Bound and Open Taa): Understanding the rules and usage of the Taa Marbuta and Open Taa in Arabic language.
Week 3	همزة الوصل والقطع	Hamzat Al-Wasl and Al-Qat' (Hamza of Connection and Hamza of Disconnection): Differentiating between Hamzat Al-Wasl and Al-Qat' and their respective roles in pronunciation.
Week 4	الهمزة المتوسطة والمتطرفة	Alif Al-Maddooda and Alif Al-Muqassara Writing Rules: Exploring the rules for writing Alif Al-Maddooda (elongated Alif) and Alif Al-Muqassara (shortened Alif).
Week 5	قواعد كتابة الالف الممدودة والمقصورة –	Solar and Lunar Letters: Identifying the distinction between solar and lunar letters in Arabic pronunciation.
Week 6	الحروف الشمسية والقمرية	Adad (Numbers): Learning about the numerical system in Arabic and its usage.
Week 7	الضاد والظاء	Verbs: Understanding verb conjugation and the different verb forms in Arabic.
Week 8	العـــدد	Parts of Speech: Exploring the different parts of speech, including nouns, verbs, adjectives, adverbs, etc.
Week 9	المفاعيل	Meanings of Prepositions: Examining the meanings and usage of prepositions in Arabic.
Week 10	أقسام الكلام	Common Language Errors: Analyzing common language errors and their applications in practical contexts.
Week 11	معاني حروف الجر	Noon and Tanween: Understanding the usage and pronunciation of Noon and Tanween in Arabic.
Week 12	تطبيقات الأخطاء اللغوية الشائعة	Taa Marbuta and Taa Marbuta (Bound and Open Taa): Understanding the rules and usage of the Taa Marbuta and Open Taa in Arabic language.
Week 13	النون والتنوين -	Hamzat Al-Wasl and Al-Qat' (Hamza of Connection and Hamza of Disconnection): Differentiating between Hamzat Al-Wasl and Al-Qat' and their respective roles in pronunciation.

Week 14	مقدمة عن الأخطاء اللغوية	Alif Al-Maddooda and Alif Al-Muqassara Writing Rules: Exploring the rules for writing Alif Al-Maddooda (elongated Alif) and Alif Al-Muqassara (shortened Alif).
Week 15	الأخطاء اللغوية	Solar and Lunar Letters: Identifying the distinction between solar and lunar letters in Arabic pronunciation.
Week 16	Preparatory week before the final Exam	

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	**No**

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	١. "الكافية" للكندي: يعتبر من أهم الكتب في علم النحو، حيث يشرح القواعد والتراكيب النحوية بأسلوب مبسط وشامل. ٢. "الصرف" لابن مالك: كتاب مشهور يتناول قواعد تصريف الأفعال والأسماء في اللغة العربية، ويعد من أعمال النحو الكلاسيكية. ٣. "المفصل في علم العربية" لابن جني: كتاب شامل يغطي مجموعة واسعة من موضوعات النحو والصرف والبلاغة والأدب	**Yes**
Recommended Texts	١. "الألفية" لابن مالك: كتاب مشهور في علم النحو والصرف، يعتبر من أهم المراجع الكلاسيكية في دراسة اللغة العربية. ٢. "المستطرف في كل فن مستظرف" لابن الأنباري: كتاب يشمل العديد من الألفاظ والتعابير العربية المستخدمة في الأدب والشعر. ٣. "البيان والتبيين" لابن حجر العسقلاني: كتاب يتناول موضوعات النحو والصرف والبلاغة، ويعتبر مرجعًا قيمًا في دراسة اللغة العربية.	**No**
Websites	**No**	

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.

Code	Course/Module Title	ECTS	Semester
NTU 103	**Arabic language**	**2**	**2**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	**0**	**32**	**18**
Description			
The description for the Arabic language is: Arabic is a rich and diverse language spoken by millions of people around the world. It is the official language of over 20 countries and holds great cultural and historical significance. With its unique alphabet, intricate grammar, and beautiful calligraphy, Arabic offers a fascinating linguistic journey. Whether you			

are interested in exploring the language for academic, professional, or personal reasons, learning Arabic opens doors to understanding Arab culture, literature, and society. From basic greetings to advanced conversational skills, mastering Arabic provides opportunities for communication, travel, and career prospects. Embrace the beauty of Arabic as you embark on a journey of language discovery and cultural immersion.

الوصف الاكاديمي لمادة اللغة العربية

اللغة العربية هي لغة غنية ومتنوعة يتحدثها الملايين من الأشخاص حول العالم. إنها اللغة الرسمية في أكثر من ٢٠ دولة وتحمل أهمية ثقافية وتاريخية كبيرة. بفضل أبجديتها الفريدة، وقواعدها المعقدة، والخط الجميل، تقدم اللغة العربية رحلة لغوية مثيرة. سواء كنت مهتمًا باستكشاف اللغة لأسباب أكاديمية، مهنية أو شخصية، فإن تعلم العربية يفتح أبوابا لفهم الثقافة العربية والأدب والمجتمع. من التحية الأساسية إلى مهارات المحادثة المتقدمة، يوفر اتقان العربية فرصًا للتواصل والسفر وفرص العمل

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	**Engineering Drawing**	**Module Delivery**	
Module Type	**Core**	☐ **Theory**	
Module Code	**TEMO 103**	☐ **Lecture**	
ECTS Credits	**7**	☒ **Lab**	
SWL (hr/sem)	**175**	☐ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	
Module Level	**1**	**Semester of Deliver**	**2**
Administering Department	**AM**	**College**	**TEMO**
Module Leader	**Hasan abd alsarraf**	**e-mail**	**hasan.alsarraf@ntu.edu.iq**
Module Leader's Acad. Title	**Asst. Lecturer**	**Module Leader's Qualification**	**M.Sc.**
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	**23/9/2024**	**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 Objectives أهداف المادة الدراسية	The Objectives of this course are to enable students to: 1. Represent the various geometric shapes in drawing. 2. Represent of the connection of bolts and screws to the drawing and

	interpretation. 3. Engage the engineering parts by symbols welding on the drawing and interpreting these symbols 4. Determine the mechanisms of movement between the geometric parts and placing the appropriate symbols on them. 5. Draw the assembled mechanical parts and determine the mechanism or method
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Capability to use AutoCAD for 2-D representations. 2. To make the students understand all about the screw threads and their definitions also to teach the students all common types for screw threads and the common types for bolts and nuts with overview in details. 3. To make the students understand all about the Keys, types of keys, spline shaft and hub concept, and the basic definitions for Keys also the correct manner for Keys drawing. 4. Enables the students to learn the techniques and standard practices of technical graphics. 5. To make the students understand all about the riveting and types of rivets. 6. Read a working or assembly drawing (blueprint). 7. Represent mechanical components in multi view orthographic representation. 8. understanding all about the welding, types of weld joints and the basic definitions for welding also the correct manner for all types of welding symbol drawing. 9. To help students understand all about the Gears classification, draw spur gear, definitions, formulas and calculations.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Introduction to (CAD), components of computer aided drawing (CAD), Exercises. [8 hrs.] Introducing the most important geometric mechanical shapes and their components, and

	how to draw each shape using the program [4hrs.] Introducing the most important commands that contribute to making modifications to the geometric shapes drawn using the program [8 hrs.] Demonstrate the method of drawing advanced geometric shapes using the program. [4 hrs.] Training students to draw advanced geometric shapes using the program [8 hrs.] Revision and quiz [8hrs] Part B - Training students at this stage to draw triangular projections of geometric shapes for any geometric shape in general. [8 hrs.] Complex geometrical shape. [12 hrs.] Training the students at this stage to draw the triangular projections of the geometric shapes of the mechanical engineering shapes in particular. [15 hrs.] Training the students at this stage to draw the Perspective. [15 hrs.] Revision and quiz [8hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. This will be accomplished through lectures, interactive tutorials, and the consideration of various sorts of easy experiments incorporating some engaging sampling exercises for the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**63**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**4**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**112**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**7**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	2.5% (10)	2 , 7 and 13	LO #1, #5 and #6
	Assignments	5	2% (10)	3 , 5, 8,10 and 14	LO #2,#3, #4 and #7
	Projects / Lab.	14	1% (14)	Continuous	All
	seminar	1	6%(6)		
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to (CAD) , Exercises
Week 2	Screw threads , Exercises
Week 3	Method of drawing (Hexagonal & Square headed bolts and nuts)
Week 4	Keys, types of keys.
Week 5	Pins and Cotters.
Week 6	Rivets and riveted joints.
Week 7	Types of riveted joints, Conventional rivet symbol, working drawing.
Week 8	Welding, type of weld joints
Week 9	Pulleys, types of pulleys.
Week 10	Gears, classification of gears, Gear tooth profile
Week 11	Assembly and details of common mechanical units
Week 12	Power screw (Assemble and details)
Week 13	Coupling, Types of coupling, Bearings, types of bearings.
Week 14	Pipes and pipe joints, piping fittings

Week 15	**pipe symbols standard**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	No

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Fundamentals and principles of engineering drawing** **Fundamentals of AutoCAD 2010**	**Yes**
Recommended Texts	**Fundamentals of AutoCAD2020**	**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	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	**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.

Code	**Course/Module Title**	**ECTS**	**Semester**
TEMO 103	**ENGINEERING DRAWING**	**7**	**2**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
0	**4**	**63**	**112**
DESCRIPTION			
Definition of engineering drawing orders and its uses - the concept of engineering programs in engineering drawing and their fields - engineering drawing tools. Types of engineering lines and their uses, exercises + function. Drawing geometric shapes on computer) rectangular, parallelepiped, square, the circle (exercises + function. Dimensions and how to put them on the drawing. Principles of projection in engineering drawing (simple shapes). Cartesian projection on three levels. uncomplicated shapes, medium complexity, Complex geometric shapes			

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mechanics Engineering / Statics2**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**AM 101**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	**1**	**Semester of Delivery**	**2**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Tariq Khalid**	**e-mail**	**tariqaikhalidi@ntu.edu.iq**		
Module Leader's Acad. Title	**Assist. Professor**	**Module Leader's Qualification**	**MASTER**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	June /01/2023	**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 Learning Outcomes مخرجات التعلم للمادة الدراسية	**11.** Apply fundamental concepts of engineering mechanics/statics to analyze and solve problems related to the equilibrium of rigid bodies. **12.** Demonstrate a deep understanding of vector mathematics and its application in statics, including vector addition, subtraction, dot product, and cross product. **13.** Apply the principles of static equilibrium to solve problems involving forces and moments acting on rigid bodies in two and three dimensions. **14.** Analyze and calculate the internal forces, such as axial forces, shear forces, and bending moments, in statically determinate structures using methods such as the method of sections and the method of joints. **15.** Utilize free-body diagrams to model and analyze the forces acting on a structure or a rigid body, and determine the resultant forces and moments at specific points. **16.** Analyze and calculate the centroid and moment of inertia of various two-dimensional shapes, including rectangles, triangles, and circles, and apply these concepts to determine the stability and strength of structures. **17.** Apply the concepts of friction and its effects on the equilibrium of bodies in statics, including calculating static and kinetic friction forces and determining the angle of friction. **18.** Analyze and calculate the forces in trusses and frames, including the method of joints and the method of sections, and determine the stability and structural integrity of these systems. **19.** Apply the principles of equilibrium to solve real-world engineering problems, such as determining the stability of structures, calculating the forces on supports and connections, and analyzing the behavior of mechanical systems. **20.** Communicate effectively, both orally and in writing, to present and explain the analysis, results, and solutions of engineering mechanics/statics problems. By achieving these module learning outcomes, students will develop a strong foundation in engineering mechanics/statics and be equipped with the necessary knowledge and skills to analyze and solve a wide range of engineering problems involving static equilibrium and structural stability.
Indicative	Indicative content includes the following.

Contents

المحتويات الإرشادية

9. Equilibrium of Rigid Bodies

- Free body diagrams and force analysis
- Equations of equilibrium in two and three dimensions
- Solving equilibrium problems using scalar and vector approaches
- Applications to simple systems and structures

10. Truss Structures

- Introduction to truss analysis
- Method of joints and method of sections
- Determination of member forces and support reactions

11. Friction

- Laws of friction and frictional forces
- Types of friction and their characteristics
- Calculation of frictional forces and moments
- Applications to inclined planes, wedges, and screws

12. Center of Gravity and Centroids

- Definitions and properties of center of gravity and centroids
- Determination of center of gravity and centroids of simple shapes
- Composite bodies and distributed loads

13. Moments of Inertia

- Moment of inertia and its physical significance
- Calculating moments of inertia for simple shapes
- Parallel-axis and perpendicular-axis theorems
- Application of moments of inertia in engineering analysis

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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**63**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**6**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**112**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**7**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative	**Quizzes**	**4**	**25% (25)**	**5,7,9 and 13**	**LO #2 , #3 , #5 and #8**

assessment	**Assignments**	**2**	**5% (5)**	**2, 10**	**LO #1 ,#4 ,#6 ,#7 and #9**
	Projects / Lab.				
	Report	**1**	**5% (5)**	**13**	**LO #5, #8 and #10**
Summative assessment	**Midterm Exam**	**2hr**	**15% (15)**	**7**	**LO #1 - #5**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Course 2 Material Covered
Week 1	**Equilibrium of a Rigid Body: Equilibrium in Two Dimensions,**
Week 2-3	**Free-Body Diagrams, *Support Reactions, Equations of Equilibrium***
Week 4	**Distributed loads.**
Week 5-6	**Friction**
Week 7	**Mid-Term Exam**
Week 9-10	**Trusses**
Week 11-12	**Centroid: Centroid of area, First moment of area.**
Week 13	**Area moment of inertia, Second moment of area. Parallel-Axis Theorem for an Area,**
Week 14	**Moments of Inertia for Composite Area**
Week 15	**Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Engineering Mechanics/ Statics, Fourteen Edition, R.C. Hibbeler**	**yes**
Recommended Texts	**1- Engineering Mechanics , Ferdinand L. Singer** **2- Engineering Mechanics, Meriam** **3- Engineering Mechanics/ Statics, Arthur P. Boresi & Richard J. Schmidt**	**No**
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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	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.

Code	Course/Module Title	ECTS	Semester
AM 101	Mechanics Engineering / Static	7	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	2	63	112

Description

Statics, is a fundamental branch of Engineering Mechanics that deals with the analysis and prediction of the behavior of objects at rest or in equilibrium. It provides the foundation for understanding the principles of forces, moments, and their effects on structures and systems. This branch of engineering mechanics is primarily concerned with the study of particles and rigid bodies under the action of forces and moments.

One of the main objectives of Engineering Mechanics/Statics is to enable engineers to calculate and predict the behavior of structures and systems under different loading conditions. This includes understanding the concepts of force vectors, moments, and couples, as well as the methods for resolving and combining these forces to determine their resultant effects.

Through theoretical study, problem-solving, and practical applications, students of Engineering Mechanics/Statics develop critical skills in analyzing and solving engineering problems. They learn to apply mathematical principles, physics, and engineering concepts to determine the forces and moments in structures and systems, and to ensure their stability and safety.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Principles of Thermodynamics**	**Module Delivery**	
Module Type	**Core**	☒ **Theory**	
Module Code	**AM 102**	☐ **Lecture**	
ECTS Credits	**7**	☒ **Lab**	
SWL (hr/sem)	**175**	☒ **Tutorial**	
		☐ **Practical**	
		☒ **Seminar**	

Module Level	**1**	**Semester of Deliver**	**2**
Administering Department	**PM**	**College**	**TEMO**
Module Leader	**Ahmad hani**	**e-mail**	**ahmed.hanigh@ntu.edu.iq**
Module Leader's Acad. Title	Assist.lecturer	**Module Leader's Qualification**	**M.Tech.**
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	**23/9/2024**	**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 Objectives أهداف المادة الدراسية	**1.** To develop problem solving skills and understanding of thermodynamics theory through the application of techniques. **2.** To understand thermodynamics and energy law. **3.** This course deals with the basic concept of heat, work and energy.

	4. This is the basic subject for all cases of systems used in thermodynamics. 5. To understand the laws of energy conversion between thermodynamics systems. 6. Introducing students to thermodynamics by studying thermal systems in terms of energy interactions with its immediate surroundings.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how temperature gauges work in laboratory equipment. 2. List the different thermodynamics terms. 3. Summarize what is meant by thermodynamics. 4. Discuss the reaction and participation of atoms in chemical reactions. 5. Describe thermal energy, work and energy. 6. Define Boyle's law. 7. Identify open and closed systems and their applications. 8. Discuss the heat transfer processes between thermal systems. 9. Discuss the different characteristics of the measuring devices used in the laboratory. 10. Explanation of Joule's law. 11. Identify the mathematical relationships in solving problems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A** • Introduction - Textbooks - Units. Important definitions - force - pressure - system. Pressure and its types [15 hrs] • Vapor - Forms of matter when changing its phase - Drawing the phase change of matter on the pressure-volume chart. [15 hrs] • Specific heat at constant pressure - specific heat at constant volume. Closed system procedures - constant volume - constant pressure. [10 hrs] • Energy Equation for Systems: Open and Closed - Applications [15 hrs] • Revision problem classes [6 hrs] **Part B** • Fundamentals • Temperature: Units - Conversions - Measuring Methods - Zero Law. Definition of energy - forms of energy: potential, kinetic, thermal - work - capacity - flow work - pressure diagram. internal energy - enthalpy [15 hrs] • Steam procedures and their projection on the pressure-volume chart [7 hrs] • Identify the types of pressure gauges used in refrigeration - types of air velocity gauges

	and their uses. [15 hrs]

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**78**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**5**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**97**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**6**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. This will be accomplished through lectures, interactive tutorials, and the consideration of various sorts of easy experiments incorporating some engaging sampling exercises for the students.

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introductions, references, units , General notations , about pressure, force, work etc.
Week 2	Temperature, unit of temperature and conversion, temperature measurements. Zeroth law of Thermodynamics. Energy, types of energy, positional, kinetic, internal and flow energy energies. Heat and work, power, enthalpy.
Week 3	First law of thermodynamics
Week 4	Steady flow energy equation for open system, non-flow energy equation for closed system, Ideal gas and equation of state
Week 5	Ideal gas, Boyle's law and Charles law and equation of state
Week 6	Specific heat at constant pressure and constant volume, closed system Processes using ideal gas. Isometric and isobaric processes.
Week 7	Isothermal and adiabatic processes
Week 8	Polytropic processes
Week 9	open system processes

Week 10	Vapor, phase of substance, Phase change curve on P-V diagram.
Week 11	Dryness fraction, liquid and vapor lines, wet vapor
Week 12	Steam tables and Examples on steam tables
Week 13	Superheated vapor, tables of superheated tables.
Week 14	Processes using two phase system, processes on P-V diagram, Irreversible processes Closed system
Week 15	Second law of thermodynamics, heat engine, heat pump
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Identify the types of pressure gauges used in refrigeration and their uses.
Week 2	Lab 2: Identify the types of air velocity gauges and their uses.
Week 3	Lab 3: Identify the types of temperature measurements used in refrigeration and their uses.
Week 4	Lab 4: Types of heat pumps with a study of the efficiency of the heat pump.
Week 5	Lab 5: compression cycle performance
Week 6	Lab 6: The real refrigeration cycle
Week 7	Lab 7: Filters

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Thermal engineering (eighth edition) R. K. RAJPUT	No
Recommended Texts	Fundamentals of heat and mass transfer (M. Thirumaleshwar)	No
Recommended Texts	Heat and mass transfer (SI UNITS) (Er. R. K. RAJPUT) (S. CHAND)	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.

Code	Course/Module Title	ECTS	Semester
AM 102	**Thermodynamics principles**	**7**	**2**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**(SSWL (hr/sem**	**(USWL (hr/sem**
2	**3**	**78**	**97**
Description			
In this thermodynamics module, students will explore the foundational concepts that form the basis of this			

field of study. They will examine energy interactions in thermal systems and measure relevant properties. Key concepts covered include force, energy, work, thermal equilibrium, and temperature. The workshop aims to develop a clear understanding of thermodynamics and its application in engineering. Students will also learn about the practical implications of thermodynamics, such as the laws of heat transfer and their applications in engine cycles. Additionally, they will explore the functioning of refrigerators and heat pumps based on the reversed Carnot cycle, which requires external work to transfer heat from a lower temperature body to a higher temperature body.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information					
Module Title	**Occupational safety**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**AM 103**			☐ **Lecture**	
ECTS Credits	**4**			☐ **Laboratory**	
SWL (hr/sem)	**100**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	**1**	**Semester of Deliver**	**2**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Haitham M. Wadullah**	**e-mail**	**Dr.haitham@ntu.edu.iq**		
Module Leader's Acad. Title	**Prof. Dr.**	**Module Leader's Qualification**	**PhD**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	**23/9/2023**	**Version Number**	**1.0**		

Relation with other Modules			
Prerequisite module	**None**	**Semester**	
Co-requisites module	**None**	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. Understand the importance of occupational safety: The module aims to provide students with a comprehensive understanding of the significance of occupational safety in the workplace. Students will learn about the potential hazards and risks associated with different industries and the impact they can have on the well-being of employees. 2. Identify common workplace hazards: Students will learn how to identify and assess various workplace hazards, including physical, chemical, biological, and ergonomic hazards. They will gain knowledge about different types of safety hazards that exist in different work environments and how to recognize them to prevent accidents and

	injuries. 3. Implement safety protocols and practices: The module will equip students with the knowledge and skills to implement effective safety protocols and practices in the workplace. They will learn about safety regulations, standards, and best practices, and understand the importance of following safety guidelines to create a safe working environment. 4. Develop risk assessment and management skills: Students will be trained in conducting risk assessments and developing risk management strategies. They will learn how to identify potential risks, evaluate their severity and likelihood, and develop appropriate control measures to mitigate or eliminate those risks.
Module Learning Outcomes	1. Identify and assess workplace hazards: Engineering students will be able to identify and assess potential workplace hazards specific to their field of engineering. They will understand the importance of hazard identification and risk assessment in order to prevent accidents, injuries, and occupational illnesses. 2. Apply engineering principles to develop safety solutions: Students will be able to apply their engineering knowledge and skills to develop innovative and effective safety solutions. They will understand how engineering principles can be utilized to design and implement engineering controls, safety devices, and protective measures to minimize or eliminate workplace hazards. 3. Implement safety standards and regulations: Engineering students will be knowledgeable about relevant safety standards and regulations applicable to their specific engineering discipline. They will understand the importance of compliance with safety standards and be able to apply them in the design, construction, operation, and maintenance of engineering systems and processes. They will also be aware of the legal and ethical responsibilities associated with ensuring occupational safety in their professional practice.
Indicative Contents	Indicative content includes the following. **Part A - Theory** Introduction to Occupational Safety, Identifying and Assessing Risks, Engineering Controls and Safety Systems, Personal Protective Equipment and Safety, Equipment Occupational Health and Industrial Health [10 hrs] Fire Safety and Emergency Preparedness, Electrical Safety in Engineering Machine and Equipment, Safety Construction, Safety in Engineering Projects, Hazardous Materials Management [10 hrs] Revision problem classes [2 hrs] **Part B – Practice** Training and Communication in Engineering Safety Incident Investigation and Reporting in Engineering Safety Management Systems in Engineering Application in Occupational Safety 1 Application in Occupational Safety 2. [10 hrs]

Learning and Teaching Strategies	
Strategies	1. Familiarize yourself with the subject: Start by understanding the key concepts, principles, and regulations related to Occupational Safety in the engineering field. This will provide a foundation for further exploration and learning. 2. Actively engage in practical applications: Apply the theoretical knowledge to real-world scenarios by analyzing case studies, conducting risk assessments, and identifying safety measures in engineering projects. This hands-on approach will help reinforce understanding and develop problem-solving skills. 3. Collaborate and discuss: Engage in discussions and group activities with fellow engineering students. Share experiences, exchange ideas, and learn from each other's perspectives. This collaborative learning environment can broaden your understanding and provide different insights into safety practices. 4. Stay updated with industry standards: Keep yourself informed about the latest safety regulations, codes, and standards relevant to the engineering field. Regularly refer to authoritative sources such as government agencies, professional organizations, and reputable publications to stay up-to-date with best practices.

Student Workload (SWL)			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**33**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**(32/15) = 2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**67**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**(18/15) = 4**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**1**	**10% (10)**	**5 and 10**	**LO #2**
	Assignments	**2**	**5% (10)**	**2 and 12**	**LO #3**
	Onsite assignments	**1**	**10%(10)**	**3**	**1**
	Report	**2**	**5% (10)**	**8 and 13**	**LO #1 and LO #2**

Summative assessment	**Midterm Exam**	**1hr.**	**10% (10)**	**7**	**LO #1 - #2**
	Final Exam	**2hr.**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة في السلامة المهنية
Week 2	تحديد المخاطر وتقييم المخاطر
Week 3	وسائل السيطرة الهندسية وأنظمة السلامة
Week 4	معدات الحماية الشخصية ومعدات السلامة
Week 5	الصحة المهنية والصحة الصناعية
Week 6	سلامة الحرائق والاستعداد للطوارئ
Week 7	سلامة الكهرباء في الهندسة
Week 8	سلامة الآلات والمعدات
Week 9	سلامة البناء في مشاريع الهندسة
Week 10	إدارة المواد الخطرة
Week 11	التدريب والتواصل في سلامة الهندسة
Week 12	تحقيق الحوادث وتقاريرها في الهندسة
Week 13	أنظمة إدارة السلامة في الهندسة
Week 14	تطبيق في السلامة المهنية ١
Week 15	تطبيق في السلامة المهنية٢
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	**No**

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	١. "السلامة والصحة المهنية" بواسطة علي عبد العزيز المرزوقي. ٢. "السلامة والصحة المهنية في البناء والتشييد" بواسطة فوزي عطا الله. ٣. "السلامة والصحة المهنية والبيئية" بواسطة مجدي الغول. ٤. "السلامة المهنية وإدارة المخاطر" بواسطة سلطان القحطاني. ٥. "السلامة المهنية والوقاية من المخاطر" بواسطة نزار السعودي. ٦. "السلامة المهنية والحريق" بواسطة حسن السناني. ٧. "السلامة والصحة المهنية في المعامل" بواسطة عمرو حسين.	**Yes**
Recommended Texts	1. "Occupational Safety and Health for Technologists, Engineers, and Managers" بواسطة David L. Goetsch و Eugene R. Pierce. 2. "Introduction to Occupational Health in Public Health Practice" بواسطة Bernard D. Goldstein و Mary Sue Henifin. 3. "Safety and Health for Engineers" بواسطة Roger L. Brauer. 4. "Occupational Safety and Health for Technologists, Engineers, and Managers" بواسطة David L. Goetsch و Eugene R. Pierce.	**No**
Websites	1. No Occupational Safety and Health Administration (OSHA): The official website of OSHA, a government agency responsible for enforcing workplace safety regulations in the United States. It offers a wealth of resources, guidelines, and educational materials on various safety topics. 2. National Institute for Occupational Safety and Health (NIOSH): NIOSH is a U.S. federal agency focused on conducting research and providing guidance on occupational safety and health. Their website offers publications, databases, training materials, and tools related to workplace safety. 3. Health and Safety Executive (HSE): HSE is the national independent regulator for workplace health and safety in the United Kingdom. Their website provides guidance, publications, and tools to help businesses and individuals understand and comply with health and safety regulations. 4. Centers for Disease Control and Prevention (CDC): While primarily focused on public health, the CDC also offers resources and information on occupational safety and health. Their website provides research, guidelines, and educational materials on various workplace safety topics. 5. Canadian Centre for Occupational Health and Safety (CCOHS): CCOHS is a Canadian organization dedicated to promoting occupational health and safety. Their website offers a wide range of resources, including fact sheets, guidelines, courses, and databases related to workplace safety. 6. European Agency for Safety and Health at Work (EU-OSHA): EU-OSHA is an agency of the European Union focused on promoting safety and health in the workplace. Their website provides information, publications, and tools to help improve workplace safety across Europe	

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.

Code	Course/Module Title	ECTS	Semester
NTU 204	**Professional Ethics and Occupational Safety**	**4**	**2**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	**0**	**33**	**67**
Description			
السلامة المهنية هي مجال دراسة يركز على تحقيق بيئة عمل آمنة وصحية للعاملين في جميع الصناعات والقطاعات. يهدف العلماء والباحثون في هذا المجال إلى تحليل وتقييم المخاطر المحتملة في مكان العمل وتطوير وتنفيذ استراتيجيات وأنظمة للوقاية والتحكم في هذه المخاطر. تشمل مجالات الدراسة في السلامة المهنية تحديد المخاطر، وتقييم المخاطر، وتصميم وتنفيذ إجراءات السلامة والوقاية، والتدريب والتثقيف، وإدارة الحوادث والطوارئ، والتشريعات والمعايير الخاصة بالسلامة. يهدف العلماء والمهنيين في هذا المجال إلى تعزيز ثقافة السلامة ورفع الوعي بأهمية			

السلامة المهنية بين العاملين وصناعة الأعمال بشكل عام. تعد السلامة المهنية جزءًا أساسيًا من الإدارة الفعالة للمخاطر وتساهم في تحسين الأداء العام والجودة ورفاهية العاملين في بيئة العمل.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

المادة بموجب كتاب الوارة ذي العدد (ت م ٣ / ٧٥٨٨ في ٢٠٢٣/١٠/١٩)

Module Title	**Crimes of the Former Ba'ath Party**	**Module Delivery**	
Module Type	منهاج دراسي ٧٥٨٨ نظام البعث في العراق منهاج دراسي ٧٥٨٨ نظام البعث في العراق ٢ **S**	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NTU 200**		
ECTS Credits	2		
SWL (hr/sem)	**50**		

Module Level	**2**	**Semester of Deliver**	**3**
Administering Department	**AM**	**College**	**TEMO**
Module Leader	**Shaima'a Salim Hameed**	**e-mail**	**Shamaaalobaidy@ntu.edu.iq**
Module Leader's Acad. Title	lecturer	**Module Leader's Qualification**	**M.Tech.**
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	**23/9/2024**	**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 Objectives	٧. تمكين الطلاب من فهم أعمق لتاريخ المنطقة وتأثير الاحزاب السياسية في تشكيل مصير الشعوب ٨. تنمية قدرات التحليل لدى الطلاب في مجال حقوق الانسان والقانون الدولي

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. This will be accomplished through lectures, interactive tutorials, and the consideration of various sorts of easy experiments incorporating some engaging sampling exercises for the students.

أهداف المادة الدراسية	٩. تشجيع التفكير في الحلول الممكنة لتحقيق العدالة والمصالحة في المجتمعات المتضررة
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١٢. فهم السياق التاريخي والسياسي لحزب البعث ١٣. تحليل الجرائم والانتهاكات التي قام بها حزب البعث ١٤. فهم الاطار القانوني الدولي ضد مرتكبي الجرائم في حزب البعث
Indicative Contents المحتويات الإرشادية	١. ادلة القراءة من كتب سياسية ٢. موارد الوسائط المتعددة من صور وخرائط ٣. ادلة التحليل القانوني من جرائم دولية وتقديم محاكمات للنظام السابق

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**32**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**18**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**1**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	**Weight**	**Week Due**	**Relevant Learning**

			(Marks)		Outcome
Formative assessment	Quizzes	2	5% (10)	4,10	LO #1, #2 ,
	Assignments	1	10% (10)	4 and 12	LO #3
	Seminar	1	10% (١0)	12	LO #4
	Report	1	10% (١0)	14	LO #4
Summative assessment	Midterm Exam	1hr.	10% (10)	7	LO #1 - #2
	Final Exam	2hr.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة في جرائم النظام وفق قانون المحكمة الجنائية العراقية العليا سنة ٢٠٠٥ مفهوم الجرائم تعريف الجرائم لغة واصطلاحا اقسام الجرائم
Week 2	جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا سنة ٢٠٠٥ انواع الجرائم الدولية القرارات الصادرة من المحكمة الجنائية العليا
Week 3	الجرائم النفسية والاجتماعية واثارها وابرز انتهاكات النظام البعثي في العراق الجرائم النفسية اليات الجرائم النفسية اثار الجرائم النفسية
Week 4	الجرائم الاجتماعية
Week 5	عسكرة المجتمع
Week 6	موقف النظام البعثي من الدين
Week 7	انتهاكات القوانين العراقية صور من انتهاكات حقوق الانسان وجرائم السلطة
Week 8	بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث اماكن السجون والاحتجاز لنظام البعث
Week 9	الجرائم البيئية لنظام البعث في العراق

Week 10	التلوث الحربي والاشعاعي وانفجار الالغام
Week 11	تدمير المدن والقرى (سياسة الارض المحروقة)
Week 12	تجفيف الاهوار تجريف بساتين النخيل والاشجار والمزروعات
Week 13	جرائم المقابر الجماعية
Week 14	احداث مقابر الابادة الجماعية المرتكبة من قبل النظام البعثي في العراق
Week 15	التصنيف الزمني لمقابر الابادة الجماعية في العراق للمدة ١٩٦٣_٢٠٠٣م
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	القران الكريم	**yes**
Recommended Texts	ارشيف مؤسسة السجناء السياسيين وارشيف مؤسسة الشهداء	No
Recommended Texts	ارشيف المركز العراقي لتوثيق جرائم التطرف في العتبة العباسية المقدسة	No
Websites	الموقع الرسمي للأمم المتحدة	

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.

Code	Course/Module Title	ECTS	Semester
NTU 203	Crimes of the Former Ba'ath Party	2	2
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**(SSWL (hr/sem**	**(USWL (hr/sem**
2	0	32	18
Description			
مادة حزب البعث عادة ما تركز على دراسة تاريخ الحزب وأثره السياسي والاجتماعي في العراق. في الجامعات العراقية، تُدرَّس هذه المادة من منظور نقدي بعد سقوط النظام في ٢٠٠٣ لفهم ماضي العراق وتأثيرات حكم حزب البعث على المجتمع. وكذلك فهم اهم الحقائق التي كانت طي الكتمان أبان النظام السابق من جرائم وتهجير وأباده جماعية ومقابر جماعية وتجريف للأراضي ونظام الاراضي المحروقة يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهناً عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولابد من الربط بينها وبين وصف البرنامج			

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory**	
Module Code	**TEMO 200**			☐ **Lecture**	
ECTS Credits	**7**			☐ **Lab**	
SWL (hr/sem)	**175**			☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	**2**	**Semester of Delivery**	**3**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Raid Abdulhadi Abdulqader**	**e-mail**	**raid.alabdullah@ntu.edu.iq**		
Module Leader's Acad. Title	**Assistant Lecher**	**Module Leader's Qualification**	**M. Sc.**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	**18\9\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 Objectives أهداف المادة الدراسية	Mathematics provides a powerful and universal language. Students are expected to use appropriate mathematical language and different forms of representation when communicating mathematical ideas, reasoning and findings, both orally and in writing. In order to reach the aims of mathematics, students should be able to: **1.** use appropriate mathematical language (notation, symbols and terminology) in

	both oral and written explanations. **2.** use appropriate forms of mathematical representation to present information. **3.** move between different forms of mathematical representation. **4.** communicate complete, coherent and concise mathematical lines of reasoning. **5.** organizes information using a logical structure.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1.** Students are able to appreciate the importance of understanding the structure of algebra to a higher-level concept. **2.** Students can create awareness, especially symbolic thinking within the framework of the theory of modules. **3.** Students have the capability to use its understanding and analyzing models of mathematics, science and technology and other disciplines related fields. **4.** Students are able to develop an understanding framework that supports science and technology, and mathematics as well as communicate the results of the development of oral and written comprehension.
Indicative Contents المحتويات الإرشادية	• Demonstrate an understanding of basic concepts in each of the module core topics (complex numbers, matrices, limits, differential equations, integration, hyperbolic functions, vectors, series, proof) • Demonstrate an understanding of basic skills and techniques in dealing with concrete examples in each of the core topics • Apply these skills and techniques to solve a wide range of familiar and unfamiliar problems in the core topics • Demonstrate an understanding of how to communicate mathematical ideas clearly and coherently

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Teaching and learning strategies can include a range of whole class, group and individual activities to accommodate different abilities, skills, learning rates and styles that allow every student to participate and to achieve some degree of success.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**63**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**4**
Unstructured SWL (h/sem)	**112**	**Unstructured SWL (h/w)**	**7**

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	5% (20)	5,8,10 and 14	LO #1,#2,#3 and #4
	Assignments	5	2% (10)	2,4,8 and 12	LO #1,#2,#3and#4
	Seminar	1	5%(5)	Continuous	All
	Report	1	5%(5)	15	3
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #2
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review in differential and integration
Week 2	Vectors: general introduction to vectors in space – equation of straight line and an equation for a plane in space – plane, tangent and perpendicular line – vector function
Week 3	Complex numbers – polar form – Euler equation – exponential and roots of complex numbers – composite functions – Cauchy-Riemann equation
Week 4	Tow and more variable equations – partial derivative
Week 5	Chain rule for partial derivative – gradient and directional derivative – maximum and minimum values for tow variable functions

Week 6	Double integral, areas and volumes – physical applications
Week7	Triple integral
Week 8	Polar coordinates – cylindrical and spherical coordinates – curve drawing in polar coordinates
Week 9	Green's theorem - divergence theorem
Week 10	The linear integration
Week 11	The Series: sequences of numbers – limits – infinite series – limit by definition - alternating series test - power series - converges interval
Week 12	Taylor/Maclaurin series for a function – general applications
Week 13	Matrices: introduction and Basic Operations
Week 14	Inverse of a Matrix (system of linear equations) – solution of equations by matrices
Week 15	Solution of Differential Equations
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**No**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**" Calculus " , Ford , S.R. and Ford , J.R. , (1963) McGraw-Hill**	**Yes**
Recommended Texts	**“Advanced Engineering Mathematics”, Erwin Kreyszig et al., (2006)**	**No**
Websites	**https://library.oapen.org/bitstream/handle/20.500.12657/31235/633792.pdf?sequence=1&isAllowed=y**	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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Code	Course/Module Title	ECTS	Semester
TEMO 200	**Mathematics**	**7**	**3**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	**0**	**63**	**112**

Description

The proficiencies of Understanding, Fluency, Problem Solving and Reasoning are fundamental to learning mathematics and working mathematically and are applied across all three strands Number and Algebra, Measurement and Geometry, and Statistics and Probability.

Understanding refers to students building a robust knowledge of adaptable and transferable mathematical concepts and structures. Students make connections between related concepts and progressively apply the familiar to develop new ideas. They develop an understanding of the relationship between the ‘why’ and the ‘how’ of mathematics. Students build understanding when they:

- connect related ideas

- represent concepts in different ways
- identify commonalities and differences between aspects of content
- describe their thinking mathematically
- interpret mathematical information

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Materials**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☒ **Seminar**	
Module Code	**AM 200**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	**2**	**Semester of Delivery**	**3**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Jamal N. Sultan**	**e-mail**	**Jamal.nayyef@ntu.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	**23/9/2023**	**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 Objectives أهداف المادة الدراسية	1. Understand the Structure of Materials: Learn about the atomic and molecular structure of materials, including the arrangement of atoms, crystal structures, and the relationship between structure and material properties. 2. Study Material Properties: Explore the various physical and mechanical properties of materials such as strength, hardness, elasticity, conductivity, thermal expansion,

	and corrosion resistance. Understand how these properties influence the behavior of materials in different applications. **3.** Learn about Material Processing: Gain knowledge about different manufacturing and processing techniques used to modify the structure and properties of materials. This may include topics such as casting, forging, welding, heat treatment, and surface treatment. **4.** Comprehend Material Selection: Understand the principles and criteria for selecting materials for specific engineering applications. Consider factors such as mechanical requirements, environmental conditions, cost, and sustainability in the material selection process. **5.** Explore Material Failure and Fracture: Study the causes and mechanisms of material failure, including fracture, fatigue, creep, and wear. Learn how to analyze and prevent failures through the application of material science principles. **6.** Examine Material Testing and Characterization: Familiarize yourself with different experimental techniques and methods used to evaluate material properties and performance. This may include tensile testing, hardness testing, microscopy, spectroscopy, and non-destructive testing. **7.** Understand Material Behavior under Different Conditions: Learn how materials respond to external factors such as temperature, pressure, and loading conditions. Study the concepts of elasticity, plasticity, viscoelasticity, and the behavior of materials at extreme temperatures. **8.** Gain Knowledge of Material Sustainability: Explore the concepts of sustainable materials, recycling, and environmental impact assessment. Understand the importance of considering the lifecycle of materials and their ecological footprint. **9.** Develop Material Design Skills: Apply material selection principles and knowledge of material properties to design components and systems that meet specific engineering requirements. Understand the relationship between material properties, manufacturing processes, and design optimization. **10.** Enhance Problem-Solving Abilities: Develop critical thinking and problem-solving skills related to material selection, material performance, and failure analysis. Apply theoretical knowledge to practical engineering challenges.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- **Knowledge of Material Properties, crystalline structure and Non-crystalline structure of metals:** Students gain a comprehensive understanding of the fundamental properties of different engineering materials such as metals, polymers, ceramics, and composites. This includes knowledge of mechanical properties (strength, stiffness, and toughness), thermal properties (conductivity, expansion), electrical properties, corrosion resistance, and other relevant characteristics. **Knowledge of atomic binding: Ionic bond, covalent bond, metallic bond, Van der Waals forces:** Students will recognize and understand the crystallography, atomic binding, bond formation, and defects. Learning the role of energy minimization in bond formation,

and the physical properties of ionic compounds. Understanding the relationship between metallic bonding strength and properties like hardness and melting points. Students get knowledge about the different types of Van der Waals forces and their impact on the behavior of molecules.

Knowledge of crystal defects, different crystals from an ingot, Crystal imperfections:

Students will explore the metal imperfections, such as vacancies, interstitials, and substitutional atoms, and their effects on hardness, ductility, and strength. Get knowledge about defects, such as point defects, which can affect electrical conductivity, carrier mobility, and the behavior of p-n junctions. Learning about defects formations during crystal growth, solidification, and plastic deformation, and how could be controlled or reduced through processes like annealing, quenching, or crystal purification.

2- **Knowledge of Solidification: different crystals form in an ingot:**

Students will understand solidification processes involve the formation of nucleated and crystallized materials, with the difference between homogeneous and heterogeneous nucleation. Get knowledge about cooling rates and its effects on grain size and structure. Learning how the solidification affects the microstructure and mechanical properties of the material. Recognize different types of crystal imperfections, such as point defects, line defects, and planar defects, and how can affect the properties of the ingot.

Knowledge of Mechanical properties, hardness, Brinell hardness, Vickers hardness, and Rockwell hardness:

Students will understand mechanical properties like strength, ductility, toughness, elasticity, and plasticity. They will learn metal hardness tests like Brinell, Vickers, and Rockwell, and develop skills for quality control, material selection, and failure analysis. They will recognize solidification processes and properties in engineering and manufacturing.

3- **Knowledge of Cooling curves for metals and alloys and the solubility of metals in each other's:**

Students will learn about the transition of metals and alloys from liquid to solid during cooling, distinguishing between pure and alloys. They will understand cooling curves, eutectic points, and their impact on microstructure. They will understand the application of cooling curves in heat treatment, industrial processes, and quality control. They will also understand the role of partially soluble metal systems in alloy development.

4- **Knowledge of Iron making and Steel making:**

Students will learn about raw materials used in iron making, their roles in the blast furnace process, chemical reactions, thermodynamics, and emissions. They will also understand cost factors, economic challenges, and conversion of pig iron and scrap into steel. They will learn about alloying elements, innovations, sustainable practices, and advancements in iron and steel production technologies. They will

gain a strong foundation in metallurgical engineering and technical aspects.

5- **Knowledge of thermal equilibrium diagram for Iron-Iron carbide:**

Students will learn about iron transformation through phases like ferrite, austenite, cementite, and pearlite at different temperatures and carbon concentrations. They will understand equilibrium phases and critical points like the eutectoid and eutectic reactions. They will predict the microstructure of iron-carbon alloys at different cooling rates and carbon content. They will understand Pearlitic, Bainitic, and Martensitic structures based on cooling rates and temperatures. Mastering the Fe-Fe_3C diagram will help students make informed decisions in material selection, processing, and applications in fields like automotive, construction, and manufacturing.

Knowledge of steel types:

Students will learn about steel's chemical composition, properties like tensile strength, ductility, hardness, and corrosion resistance, and their applications. They will understand low, medium, and high-carbon steels, alloying elements, and high hardness steels. They also will explore steels used in construction, automotive, aerospace, and manufacturing industries.

6- **Knowledge of Impurities (alloying elements) in steel:**

Students will learn the impact of various elements on steel's mechanical and physical properties. They will get knowledge about how elements like carbon, manganese, and chromium enhance steel's strength, hardness, and wear resistance. They will be able to discuss how these elements improve ductility and toughness, enhance corrosion resistance, and affect the formation of martensite. In addition, they will be able to discuss how impurities like sulfur and phosphorus can lead to brittleness. They will recognize how alloying elements influence steel's phase transformations, heat treatment processes, thermal conductivity, electrical conductivity, and recycling processes. They will get a comprehensive understanding of alloyed and impure steels, enhancing engineering design and processing.

7- **Knowledge of Cast Iron, and types of cast Iron**:

Students should understand cast iron's chemical composition, including its high carbon content and alloying elements. They should also understand different types of cast iron, their properties, and their applications in industry. The students will also understand how cast iron behaves under different stresses and temperatures, and common failure modes. This knowledge helps in selecting the right material for engineering and industrial applications.

Knowledge of heat treatments and surface hardening of steel:

Students should understand heat treatments of steel, such as annealing, normalizing, and quenching, to enhance performance in various industries. They should also understand how these treatments alter steel's microstructure, critical transformation temperatures, and alloying elements' impact. They will get knowledge about how surface hardening increases steel resistance, wear, and abrasion resistance, offering

	economic benefits and optimizing processes.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **1.** Metals: Ferrous Metals: Iron, Carbon, Manganese, Chromium, Nickel, Molybdenum, etc. Non-Ferrous Metals: Aluminum, Copper, Zinc, Lead, Tin, Titanium, etc. **2.** Polymers (Plastics): • Polyethylene: Ethylene monomer units • Polypropylene: Propylene monomer units • Polyvinyl Chloride (PVC): Vinyl Chloride monomer units • Polystyrene: Styrene monomer units • Polyethylene Terephthalate (PET): Ethylene Glycol, Terephthalic Acid **3.** Ceramics: • Traditional Ceramics: Clay, Feldspar, Silica, Alumina • Advanced Ceramics: Zirconia, Silicon Carbide, Aluminum Nitride, Boron Nitride **4.** Composites: • Fiber Reinforced Composites: Glass fibers, Carbon fibers, Aramid fibers • Matrix Materials: Epoxy resins, Polyester resins, Thermoplastics **5.** Semiconductors: Silicon: Pure silicon with small amounts of impurities (dopants) like Boron or Phosphorus **6.** Concrete: • Cement: Portland cement (mainly composed of Calcium, Silicon, Aluminum, Iron) • Aggregates: Crushed stone, Sand, Gravel **7.** Wood: • Cellulose: Main constituent of wood • Lignin: Provides rigidity and strength to wood **8.** Glass: • Silica: Main component of glass • Various additives: Sodium carbonate, Calcium oxide, Aluminum oxide, etc.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

1. Active Learning: Engage students in hands-on activities, experiments, and projects that involve working with engineering materials. This could include laboratory sessions, case studies, or design projects that require students to apply their knowledge to real-world problems.
2. Visualization Tools: Utilize visualization tools such as diagrams, models, and simulations to help students understand the structure, properties, and behavior of different engineering materials. This can enhance their conceptual understanding and make complex concepts more accessible.
3. Practical Examples: Provide practical examples of engineering materials used in real-world applications. Showcase the materials' properties and performance in various industries, such as aerospace, automotive, or construction. This can help students connect theoretical knowledge with practical relevance.
4. Collaborative Learning: Encourage collaboration among students through group discussions, team projects, and peer learning. This fosters active engagement and allows students to learn from each other's perspectives and experiences. Assigning group projects that involve materials selection, analysis, or testing can enhance teamwork and problem-solving skills.
5. Problem-Based Learning: Present students with real or hypothetical engineering problems that require material selection or analysis. This approach promotes critical thinking, problem-solving skills, and the application of theoretical knowledge to practical scenarios. Encourage students to research, analyze, and propose solutions using appropriate materials.
6. Multimedia Resources: Utilize multimedia resources such as videos, interactive websites, and online simulations to supplement classroom lectures and textbooks. These resources can provide visual representations, demonstrations, and interactive experiences that enhance understanding and engagement.
7. Guest Speakers and Industrial Visits: Invite industry professionals, researchers, or experts in materials engineering to give guest lectures or organize industrial visits. This exposes students to real-world applications, current research trends, and industry practices, providing valuable insights and networking opportunities.
8. Formative Assessment: Incorporate formative assessment methods such as quizzes, concept maps, or short assignments to gauge students' understanding of engineering materials throughout the learning process. This helps identify areas of improvement and allows for timely feedback and clarification.
9. Scaffolded Learning: Break down complex concepts into smaller, more manageable units and provide scaffolding to support students' learning progression. Start with foundational knowledge and gradually build up to more advanced topics, ensuring students grasp fundamental principles before moving forward.
10. Reflective Practices: Encourage students to reflect on their learning experiences,

	make connections between theory and practice, and identify areas of improvement. Incorporate reflective exercises, journals, or group discussions to promote metacognitive skills and enhance self-directed learning.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**93**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**6**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**82**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**5**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	**3**	**5% (15)**	**4, 6, and 8**	**LO #3, #5 and #7**
	Assignments	**2**	**5% (10)**	**3, and 5**	**LO #2 and #4**
	Projects / Lab.	**10**	**1% (10)**	**Continuous**	**All**
	Report	**1**	**5% (5)**	**6**	**Lo #8**
Summative assessment	**Midterm Exam**	**2hr**	**10% (10)**	**7**	**LO #1, #2,#3,#4,#5, #6 and #7**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to engineering materials

	Types of engineering materials Properties of engineering materials Crystalline structure and non-crystalline structure
Week 2	Atom binding: Ionic bond, covalent bond, metallic bond, Van der Waals forces
Week 3	Crystal defects, different crystals from an ingot, crystal imperfections
Week 4	Solidification: different crystals form in an ingot
Week 5	Mechanical properties, hardness, Brinell hardness
Week 6	Vickers hardness, and Rockwell hardness
Week 7	Cooling curves for metals and alloys
Week 8	Solid solution, two metals completely soluble in each other in solid state,
Week 9	Two metals completely insoluble in each other in solid state, Two metals partially soluble in each other in solid state,
Week 10	Iron making. steel making
Week 11	Thermal equilibrium diagram for Iron-Iron carbide, types of steel
Week 12	Impurities in steel
Week 13	Cast Iron, types of cast Iron
Week 14	Heat treatments of steel
Week 15	Surface hardening of steel
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Mechanical Tests.
Week 2	Lab 2: Specimen Preparation For Microscopic Examination.
Week 3	Lab 3: Microscopic Examination of Different Types of Steel.
Week 4	Lab 4: Heat Treatments of Steel.
Week 5	Lab 5 Surface Hardening of Steel.
Week 6	Lab 6: Microstructure Examination of Stainless Steel .

Week 7	Lab 7: Microstructure Examination of Cast Iron.
Week 8	Lab 8: Thermal Equilibrium Diagrams of Two Metals Completely Soluble in Each Other in Liquid States.
Week 9	Lab 9: Impact Test.
Week 10	Lab 10: Fatigue Test.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. "Materials Science and Engineering: An Introduction" by William D. Callister Jr. and David G. Rethwisch.	Yes
Recommended Texts	1. "Introduction to Materials Science for Engineers" by James F. Shackelford. 2. "Mechanical Metallurgy" by George E. Dieter. 3. "Fundamentals of Materials Science and Engineering" by William D. Callister Jr. and David G. Rethwisch. 4. "Engineering Materials 1: An Introduction to Properties, Applications, and Design" by Michael F. Ashby and David R. H. Jones.	No
Websites	1. Materials Research Society (MRS) - The MRS website (www.mrs.org) offers a wide range of materials science resources, including journals, publications, news, events, and educational materials. It is a leading organization dedicated to advancing the field of materials research. 2. American Ceramic Society (ACerS) - The ACerS website (www.ceramics.org) focuses specifically on ceramic materials. It provides access to journals, conferences, educational resources, and news related to ceramics and other related materials. 3. Materials Today - Materials Today (www.materialstoday.com) is an online platform that covers various aspects of materials science, including news, articles, reviews, and interviews. It covers a broad range of material classes, such as metals, polymers, composites, and nanomaterials. 4. ASM International - ASM International (www.asminternational.org) is an organization that focuses on the science and engineering of materials. Their website provides access to technical publications, educational resources, events, and a knowledge base with information on various materials and their applications. 5. National Institute of Standards and Technology (NIST) - The NIST website	

	(www.nist.gov/materials-science-and-engineering) offers resources related to materials science and engineering, including research papers, databases, measurement techniques, and standards. It is a valuable resource for those interested in materials characterization and properties. 6. Elsevier Materials Science - Elsevier's Materials Science website (www.elsevier.com/physical-sciences/materials-science) provides access to a wide range of scientific journals and publications in the field of materials science. It covers topics such as materials synthesis, characterization, properties, and applications.

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.

Code	Course/Module Title	ECTS	Semester
AM 200	Engineering Materials	7	3

Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
4	2	93	82

Description

Engineering materials are vital substances used in various engineering applications. They possess specific physical and chemical properties that make them suitable for specific purposes. These materials can be classified into metals, ceramics, polymers, composites, and specialized materials.

Metals are versatile with excellent strength, ductility, and conductivity. Steel, aluminum, copper, and titanium are commonly used metals in engineering. Ceramics are hard, brittle materials with high melting points. They exhibit resistance to heat, wear, and corrosion. Alumina, silicon carbide, and porcelain are examples of ceramics.

Polymers, also known as plastics, are lightweight materials with flexibility and corrosion resistance. They can be easily molded into various shapes. Polyethylene, polystyrene, and PVC are commonly used polymers. Composites are engineered materials made from different constituent materials, providing enhanced properties such as high strength and low weight. Fiberglass and carbon fiber reinforced polymers are examples of composites.

Specialized materials include semiconductors for electronic devices, superconductors for energy applications, and biomaterials for medical implants. Each material type has unique characteristics and is selected based on specific engineering requirements.

Overall, understanding engineering materials is essential for selecting the right materials for various applications and ensuring optimal performance in engineering projects.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Fluid Mechanics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**AM 201**			☐ **Lecture**	
ECTS Credits	**7**			☒ **Lab**	
SWL (hr/sem)	**175**			☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	**2**	**Semester of Deliver**	**3**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Mohammed Raad Abdulwahab**	**e-mail**	**Mohammed.raad@ntu.edu.iq**		
Module Leader's Acad. Title	**Lecturer**	**Module Leader's Qualification**	**M.Eng.**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	**23/9/2023**	**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 Objectives أهداف المادة الدراسية	**1.** To understand the properties of fluids, dimensions and units. **2.** To derive the equation of conservation of mass, momentum, energy and its application. **3.** To use important concepts of continuity equation, Bernoulli's equation and turbulence, and apply the same to problems.

	4. To understand the various flow measuring devices. 5. To understand the classification of flows: Steady, unsteady, uniform, non-uniform, laminar, turbulent.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand how to convert the unit system from British to SI. unit or vice versa. 2. Training the students how to solve the problems associated with fluid mechanics. 3. Measure the fluid flow of liquids by different types of flow meters. 4. Analyze the magnitude of the horizontal and vertical components of the force of the water on the gate. 5. Determine the reading on the pressure gauge by the different types of manometers. 6. Draw simple hydraulic and energy gradient lines. 7. Solve the formulas of open channel flow.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A- Introduction**: Basic concepts of fluid mechanics. Fundamental terms. Physical values. Fluids and their properties. Forces inside fluid. Measurement of pressure. Relative statistics of fluid – constant acceleration, rotation. Forces of hydrostatic pressure. Buoyancy. Streamlines. Stream surface. Stream tube. Mass/volume flow. Control volume. **Fluid Dynamics**: Continuity equation. Basic laws of fluid dynamics – conservation of mass, conservation of linear momentum, conservation of energy. Ideal fluid flow. Application of Bernoulli's equation. Real fluid flow. Viscosity. Determination of losses. Reynolds experiment. Laminar and turbulent flow. Boundary layer. Velocity profile. Losses in pipes. Frictional losses. Moody's diagram. Local losses. Pumps, types. Turbines and the working principle of the turbine. **Part B- Analyze characteristics of a particular flow.** Formulate the governing equations and boundary conditions. Solve these equations analytically in simple cases. Revision problem classes and quiz [6 hrs]

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, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving

	some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**93**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**6**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**82**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**5**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	**3**	**9**	**3, 5, and 10**	**LO #1, #2 and #5**
	Assignments	**5**	**15**	**2, 4, 6, 9, and 12**	**LO #3, #4, #6 and #7**
	Projects / Lab.	**6**	**12**	**Continuous**	**All**
	Seminar	**1**	**4**		
Summative assessment	**Midterm Exam**	**2hr**	**10% (10)**	**7**	**LO #1 - #7**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Units system
Week 2	Physical properties of fluids.
Week 3	Physical properties of fluids.

Week 4	Fluid pressure at static.
Week 5	Fluid pressure instruments.
Week 6	Hydrostatic force on a plane surface.
Week 7	Hydrostatic force on an inclined surface
Week 8	Hydrostatic force on a curved surface.
Week 9	Fluid dynamics / classifications of fluids.
Week 10	Conservation of mass.
Week 11	Conservation of momentum and its application.
Week 12	Conservation of energy- Bernoulli equation.
Week 13	Bernoulli equation applications.
Week 14	Viscous flow in pipes.
Week 15	Pumps or turbines.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Density and Specific Gravity.
Week 2	Lab 2: DETERMINATION OF LIQUID VISCOSITY USING STOCK`S METHOD.
Week 3	Lab 3: Determination of Centre of Pressure and Hydro-static Force on Plane surface (Part One).
Week 4	Lab 4: Determination of Centre of Pressure and Hydro-static Force on Plane surface (Part Two).
Week 5	Lab 5: Reynolds Number Investigation.
Week 6	Lab 6: Estimation of the Volume Flow Rate Using Orifice Meter Apparatus.
Week 7	Lab 7: IMPACT OF WATER JET ON VANES.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	FLUID MECHANICS	Yes
Recommended Texts	1- A TEXTBOOK OF FLUID MECHANICS AND HYDRAULIC MACHINES BY RAJPUT. 2- Fluid Mechanics by Yunus A. Cengel, John M.	No

	Cimbala. 3- fluid_mechanics_frank_m._white_4th_ed.	
Websites	https://www.youtube.com/watch?v=jjqGoWfPKUY&t=43s	

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.

Code	**Course/Module Title**	**ECTS**	**Semester**
AM 201	**Fluid Mechanics**	**7**	**3**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
4	**2**	**93**	**82**

Description
Fluid Mechanics, the branch of science that deals with the study of fluids (liquids and gasses) in a state of rest or motion, is an important subject of Civil, Mechanical and Chemical Engineering. Its various branches are fluid statics, fluid kinematics and fluid dynamics. A substance that flows is called a fluid. All liquid and gaseous substances are considered to be fluids. Water, oil, and others are very important in our day-to-day life as they are used for various applications. For instance, water is used for generation of electricity in hydroelectric power plants and thermal power plants, water is also used as the coolant in nuclear power plants, oil is used for the lubrication of automobiles etc. Fluid Mechanics is the branch of science that studies the behavior of fluids when they are in state of motion or rest. Whether the fluid is at rest or motion, it is subjected to different forces and different climatic conditions and it behaves in these conditions as per its physical properties. Fluid mechanics deals with three aspects of the fluid: static, kinematics, and dynamics aspects.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mechanical Drawing**			**Module Delivery**	
Module Type	**Core**			☐ **Theory**	
Module Code	**AM 202**			☐ **Lecture**	
ECTS Credits	**7**			☒ **Lab**	
SWL (hr/sem)	**175**			☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	**2**	**Semester of Delivery**	**3**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Abd alrahman sami**	**e-mail**	**abd.s.akeel@ntu.edu.iq**		
Module Leader's Acad. Title	**Asst. Lecturer**	**Module Leader's Qualification**	**M.Sc.**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	**23/9/2023**	**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 Objectives أهداف المادة الدراسية	**1.** to train students: to read the technical drawings through the application of techniques. **2.** Learn students to read symbols, technical terms, standard specifications. **3.** To understand the basic principle for descriptive geometry..

	4. This course deals with the basic concept of the computer in mechanical drawing. 5. To be able to communicate with manufacturers of mechanical systems. 6. To understand standard specifications, draw simple and complex assembly drawings. 7. To be able to communicate with other mechanical engineering professionals regardless of their spoken language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Capability to use AutoCAD for 3-D representations. 2. the ability to make a 3D drawing from scratch, 3. make manufacturing drawings with all annotations and 4. create presentation-ready 5. details using 3D models. 6. Enables the students to learn the techniques and standard practices of technical graphics. 7. renderings with custom materials 8. Represent mechanical components in multi view orthographic representation
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **Introduction To AutoCAD 3D** • Introduction • Understanding and navigation in 3d workspace • Using view control and view cube • Using visual styles • Working with model space viewports **3D SOLID MODELING** • Creating Solid primitives • Extrude command • Presspull command • Revolve command • Sweep command • Loft Command **SOLID EDITING** • Fillet and Chamfer edge • Shell Command • Slice Command • Interfere command • extract edges and Copy edges • Extrude, Taper and Move Face

	• Copy, Offset, Delete and color Face • 3D mirror command • 3D array command • Convert to surface, solid and thicken command **VISUALIZING SOLIDS** • Understanding User coordinate system (UCS) • Move, rotate and Scale object using gizmo • Align objects • Visualizing solid with sectional planes • Creating 2D/3D Blocks with generate section • Creating 2D layout views from 3D drawing • Creating detail and sectional view • Annotating layout views **SURFACE MODELING** • Making surface using Extrude, Revolve, Sweep and Loft • Planar and Network command • Surface trim, Untrim and Extend command **RENDERING AND PRESENTATION** • Applying materials to 3D solids • Customizing material properties • Placing Cameras and making views • Adding interior Lights and making quick Rendering • Creating and saving renderings as image file

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. This will be accomplished through lectures, interactive tutorials, and the consideration of various sorts of easy experiments incorporating some engaging sampling exercises for the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**63**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**4**

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**112**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**7**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	**3**	**10% (10)**	**3, 6 and 12**	**LO #1, #2, #4, #6**
	Assignments	**5**	**10% (10)**	**2, 5, 9, 11 and 14**	**LO #3, #5, #7,and #8**
	Projects / Lab.	**14**	**20% (20)**	**Continuous**	**All**
	Report				
Summative assessment	**Midterm Exam**	**2hr**	**10% (10)**	**7**	**LO #1 - #7**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to AutoCAD 3D
Week 2,3,4	3d Solid Modeling .
Week 5,6,7	Solid Editing
Week 8,9,10	Visualizing Solids
Week 11,12	Surface Modeling
Week 13,14,15	Rendering and Presentation
Week 16	Preparatory Week Before The Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر	
	Material Covered

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	k. l. Narayana p. kannaiah k. venketa reddy mechanical engineering.	Yes
Recommended Texts	Up.and.Running.with.AutoCAD .2012.2D.and.3D.Drawing.and.Modeling	yes
Websites	https://learnengineering.in/mechanical-drawing-books/	

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.

Code	Course/Module Title	ECTS	Semester
AM 202	Mechanical Drawing	7	3
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
0	4	63	112
Description			
The course on Mechanical Drafting provides comprehensive training on various aspects of drafting and design in mechanical engineering. It covers topics such as the use of AutoCAD 3D system for mechanical drafting. The course includes practical examples and exercises that allow students to gain hands-on experience in drawing each component. By completing this course, students can enhance their knowledge and skills in mechanical engineering drafting, enabling them to create accurate and detailed drawings for various mechanical components and systems.			

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information					
Module Title	**Electrical and Electronic Engineering**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory**	
Module Code	**TEMO 201**			☐ **Lecture**	
ECTS Credits	**7**			☒ **Tutorial**	
SWL (hr/sem)	**175**			☒ **Lab**	
				☐ **Seminar**	
Module Level	**2**		**Semester of Deliver**		**4**
Administering Department	**AM**		**College**		**TEMO**
Module Leader	**Safwan Assaf Hamoodi** The file (module description form of electrical and electronic engineering) prepared by Prof. Dr. Haitham M. Wadullah		**e-mail**		**Safwan79azb@ntu.edu.iq**
Module Leader's Acad. Title	**Assist. Prof.**		**Module Leader's Qualification**		**M.Sc.**
Module Tutor	**Haitham M. Wadullah**		**e-mail**		**Dr.haitham@ntu.edu.iq**
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	**23/9/2023**		**Version Number**		**1.0**

Relation with other Modules			
Prerequisite module	**None**	**Semester**	
Co-requisites module	**None**	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	**1.** Building a foundation for studying electrical calculations in both AC and DC circuits, and familiarizing students with the various theories used in these calculations. **2.** Gaining a comprehensive understanding of electrical principles and concepts, such as voltage, current, resistance, and power. This knowledge will be applied to the analysis of electrical circuits and systems. **3.** Developing practical skills in electrical measurements and testing by using

	various instruments and equipment. Students will learn how to accurately measure electrical parameters, interpret the results, and troubleshoot electrical systems. 4. Applying the acquired knowledge to the operation and maintenance of electrical machines, including motors and generators. Students will also explore the fundamentals of power systems, including power generation, transmission, and distribution.
Module Learning Outcomes	1. Mastery of electrical circuit theory: Students will acquire a comprehensive understanding of the fundamental principles of electrical circuit theory, encompassing key concepts such as voltage, current, resistance, and power. They will be proficient in applying this knowledge to analyze and solve basic electrical circuits. 2. Proficiency in electrical measurements and testing: Students will develop expertise in utilizing electrical instruments and equipment for precise measurements and thorough testing of electrical parameters. They will learn to interpret measurement outcomes accurately and effectively troubleshoot electrical systems to identify and rectify faults. 3. Application of electrical machines and power systems: Students will explore the principles and workings of electrical machines, including motors and generators, gaining insight into their applications and performance characteristics. Additionally, they will develop a foundational understanding of power systems, encompassing power generation, transmission, and distribution aspects, enabling them to comprehend the broader context of electrical engineering.
Indicative Contents	**Part A:** Fundamentals of Electrical Principles, Measurements, and Instruments [20 hours] Introduction to Electrical Machines, Power Systems, Safety, and Direct Current Circuits [20 hours] Revision Session and Quiz [1.5 hours] **Part B:** Alternating Current Circuits, Circuit Theory, and Analogue Electronics [20 hours] Control Systems, Renewable Energy, Troubleshooting, and Maintenance [10 hours] Revision Session and Quiz [1.5 hours] Revised Description: Part A of the course focuses on building a strong foundation in electrical engineering. Students will start by understanding the basic principles of electricity, along with electrical measurements and the use of instruments. They will then explore electrical machines, power systems, and safety considerations in the context of direct current circuits. A revision session and quiz will help reinforce the learned concepts.
Learning and Teaching Strategies	

Strategies	1. Active Participation: Actively participate in class discussions to engage with the subject matter and deepen your understanding. 2. Problem-Solving Skills: Develop and enhance your problem-solving skills, as they are essential in Electrical and Electronic Engineering. 3. Practical Application: Gain hands-on experience through laboratory sessions and projects, allowing you to apply theoretical concepts to real-world scenarios. 4. Collaborative Learning: Foster collaborative learning by actively engaging in group discussions and study sessions with your peers. 5. Utilize Learning Resources: Make effective use of various resources such as textbooks, online tutorials, video lectures, and educational websites to supplement your learning and broaden your knowledge. 6. Time Management: Manage your time effectively by creating a study schedule and dedicating specific time slots for studying Electrical and Electronic Engineering. 7. Regular Review and Recap: Continuously review previously covered topics to reinforce your understanding and ensure long-term retention of the learned material.

Student Workload (SWL)

Structured SWL (h/sem) **الحمل الدراسي المنتظم للطالب خلال الفصل**	**78**	**Structured SWL (h/w)** **الحمل الدراسي المنتظم للطالب أسبوعيا**	**5**
Unstructured SWL (h/sem) **الحمل الدراسي غير المنتظم للطالب خلال الفصل**	**97**	**Unstructured SWL (h/w)** **الحمل الدراسي غير المنتظم للطالب أسبوعيا**	**6**
Total SWL (h/sem) **الحمل الدراسي الكلي للطالب خلال الفصل**	**175**		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	**2**	**10% (10)**	**5 and 10**	**LO #1and #2**
	Assignments	**2**	**5% (5)**	**2 and 12**	**LO #2 and #3**
	Projects / Lab.	**9**	**15% (15)**	**Continuous**	**LO #1 and #3**
	Report	**1**	**10% (10)**	**13**	**LO #3**
Summative assessment	**Midterm Exam**	**2hr.**	**10% (10)**	**7**	**LO #1 - #2**
	Final Exam	**2hr.**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus)	
Week	**Material Covered**
Week 1	D.C motors, construction, commutator, types of D.C motors
Week 2	Back e.m.f, speed equation, speed control
Week 3	Load Toque Requirement, types Load Torque
Week 4	Starting of D.C motor, starter connection, torque of D.C motors
Week 5	Speed-torque characteristics of each type of D.C motor
Week 6	Examples to evaluate the starting current of D.C motor with and without starter, speed control
Week 7	Single phase induction motor, split-phase, capacitor-start, shaded-pole type
Week 8	3-phase induction motor, construction, synch. Speed, slip.
Week 9	Control of three-phase induction motor using voltage frequency control.
Week 10	Starting of 3-phase induction motor, star-delta method, step down transformer
Week 11	Torque characteristic, max torque
Week 12	3-phase system, star and delta connection, line current, line voltage, phase current and voltage
Week 13	Instruments and measurements, ammeters, voltmeter, ohmmeter, kw - h meters.
Week 14	Contactors, relays, timers
Week 15	Thermal overload, starter (contactor +timer)
Week 16	Final Examination

Delivery Plan (Weekly Lab. Syllabus)	
Week	**Material Covered**
Week 1	Lab 1: Basic wiring diagram for electrical measurements
Week 2	Lab 2: Measurement of inductive reactance of comp. windings
Week 3	Lab 3: Test of current, voltage and solid-state relay
Week 4	Lab 4: Test and calibrate pressure switch and thermostat
Week 5	Lab 5: Test of overload and defrost.
Week 6	Lab 6: Start-up compressor with solid state relay.

Week 7	Lab 7: Start-up compressor with current relay
Week 8	Lab 8: Rotor Voltage Control of Induction Motor
Week 9	Lab 9: Frequency Control of Induction Motor
Week 10	Lab 10: slip power control by dc converter of Induction Motor
Week 11	Lab 11: Single phase Dismantling of induction motor
Week 12	Lab 12: Make fault on voltage and current relay, effect of faults
Week 13	Lab 13: damage, notice the effects
Week 14	Lab 14: Dismantling of induction motor

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	1. "Electric Machinery and Power System Fundamentals" by Stephen J. Chapman 2. "Electricity and Electronics for HVAC" by Rex Miller and Mark R. Miller 3. "Principles of Electric Machines and Power Electronics" by P.C. Sen 4. "Electrical Power Systems: Design and Analysis" by Mohamed E. El-Hawary	
Recommended Texts	1. "Electrical Wiring Residential" by Ray C. Mullin and Phil Simmons 2. "Industrial Electrical Troubleshooting" by Lynn Lundquist 3. "Electrical Safety Handbook" by John Cadick, Mary Capelli - Schellpfeffer, and Dennis Neitzel 4. "Digital Control Systems" by Benjamin C. Kuo 5. "Electromechanical Energy Conversion" by David J. Braun	
Websites	• (www.allaboutcircuits.com) • (www.electrical4u.com) • (www.khanacademy.org)	

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.

Code	Course/Module Title	ECTS	Semester
TEMO 201	Electrical and Electronic Engineering	7	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	3	78	97

Description

Electrical and Electronic Engineering is a dynamic and rapidly evolving field that focuses on the study, design, and application of electrical systems, devices, and technologies. This discipline plays a critical role in shaping the modern world, as it encompasses a wide range of areas, including power generation and distribution, communication systems, electronics, control systems, and renewable energy. In Electrical and Electronic Engineering, students delve into the fundamental principles of electricity, circuits, and electromagnetism. They learn how to analyze and design electrical systems, apply mathematical and scientific principles to solve complex problems, and utilize advanced tools and software for simulation and modeling. The field emphasizes hands-on experience through laboratory work, where students gain practical skills in building, testing, and troubleshooting

electrical circuits and devices. They also explore emerging technologies, such as renewable energy sources and sustainable power systems, to address the growing demand for cleaner and more efficient energy solutions.

Through their studies, students develop a strong foundation in engineering principles, critical thinking, problem-solving, and project management. They become adept at designing, implementing, and maintaining electrical and electronic systems that are safe, reliable, and sustainable. Graduates of Electrical and Electronic Engineering programs find diverse career opportunities in industries such as power generation, telecommunications, electronics, automation, and research and development.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Strength of Materials**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**AM 203**			☐ **Lecture**	
ECTS Credits	**7**			☐ **Lab**	
SWL (hr/sem)	**175**			☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	**2**	**Semester of Delivery**	**4**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Hussein Mohammed Ali**	**e-mail**	**alabadi.hussein@ntu.edu.iq**		
Module Leader's Acad. Title	**Assist. Professor**	**Module Leader's Qualification**	**Ph.D.**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	**23/9/2023**	**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 Objectives أهداف المادة الدراسية	**1)** To know different types of the stresses which may subjected to the mechanical elements and their expected effects such as strain. **2)** To study the shear forces and bending moment diagrams with essential stresses

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students who successfully complete this course will have demonstrated an ability to: **1.** Understand the concepts of stress and strain at a point as well as the stress-strain relationships for homogenous, isotropic materials. **2.** Calculate the stresses and strains in axially-loaded members, circular torsion members, and members subject to flexural loadings. **3.** Calculate the stresses and strains associated with thin-wall spherical and cylindrical pressure vessels. **4.** Determine the stresses and strains in members subjected to combined loading and apply the theories of failure for static loading. **5.** Determine and illustrate principal stresses, maximum shearing stress, and the stresses acting on a structural member. **6.** Determine the deflections and rotations produced by the three fundamental types of loads: axial, torsional, and flexural. **7.** Analyze slender, long columns subjected to axial loads. **8.** Design simple bars, beams, and circular shafts for allowable stresses and loads.
Indicative Contents المحتويات الإرشادية	**1.** Introduction to Strength of Materials A. Definition and Importance of Strength of Materials B. Historical Background C. Applications of Strength of Materials **2.** Stress and Strain A. Basic Definitions B. Types of Stresses C. Types of Strains D. Hooke's Law **3.** Axial Loading A. Normal Stress and Strain B. Deformation of Axially Loaded Members C. Stress-Strain Diagrams D. Elastic and Plastic Deformation E. Factor of Safety **4.** Torsion A. Torque and Torsional Shear Stress B. Polar Moment of Inertia C. Torsional Deformation D. Power Transmission in Shafts **5.** Bending

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 types of simple experiments involving some sampling

	activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**93**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**(93/15) = 7**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**82**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**(82/15) = 5**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	3,6,11,13 and 15	LO #1, #3, #5, #6and #7
	Assignments	3	10% (10)	4,7 and 14	LO #2, #4 and #8
	Projects / Lab.	10	20% (20)	Continuous	All
	Report				
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Simple stress
Week 2	Shearing stress, Bearing stress
Week 3	Thin wall cylinders

Week 4	**Simple strain, stress-strain diagram, Hook's law**
Week 5	**Thermal stress**
Week 6	**Welded connection**
Week 7	**Riveted joints**
Week 8	**Torsion**
Week 9	**Spring**
Week 10	**Shear and moment in Beam**
Week 11	**Beam deflection**
Week 12	**Deflection cantilever Beam**
Week 13	**Deflection of simply supported Beam**
Week 14	**Combined stresses**
Week 15	**Stress at a point /Mohr circle**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1:Introduction to Strength of materials
Week 2	Lab 2: Brinell Hardness Test
Week 3	Lab 3: Rockwell Hardness Test
Week 4	Lab 4: Vickers Hardness Test
Week 5	Lab 5: Tensile Test
Week 6	Lab 6: Compression Test
Week 7	Lab 7: Torsion Test
Week 8	Lab 8: Creep Test
Week 9	Lab 9: Spring Stiffness
Week 10	Lab 10: Deflection in Cantilever Beam Test

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

Required Texts	Strength of Materials, Ferdinand L. Singer and Andrew Pytel.	Yes
Recommended Texts	Schaum's Outline of Strength of Materials	No
Websites	https://www.coursera.org/learn/mechanics-1	

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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Code	**Course/Module Title**	**ECTS**	**Semester**
AM 203	**Strength of Materials**	**7**	**4**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**

4	**2**	**93**	**82**

Description

The field of strength of materials, also known as mechanics of materials, focuses on analyzing the stresses and strains experienced by structural components like beams, columns, and shafts. Engineers use different techniques to determine how these structures will respond to loads and potential failure modes. This analysis takes into consideration material properties, including yield strength, ultimate strength, Young's modulus, and Poisson's ratio. By understanding these properties, engineers can predict the behavior of a structure and design it to withstand the expected forces and stresses. Strength of materials is essential in ensuring the structural integrity and safety of engineering projects.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Mechanics/ Dynamics 1**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**AM 204**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	**2**	**Semester of Delivery**	**4**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Abd alrahman sami**	**e-mail**	**abd.s.akeel@ntu.edu.iq**		
Module Leader's Acad. Title	**Assist. lecturer**	**Module Leader's Qualification**	**MASTER**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	**23 /9/2023**	**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 Objectives أهداف المادة الدراسية	Module Objectives for Engineering Mechanics/Dynamics: 1. Understand the fundamental concepts and principles of dynamics, including motion, forces, and acceleration. 2. Apply kinematic equations to analyze the motion of particles and rigid bodies in various scenarios. 3. Determine the relationship between forces, mass, and acceleration using Newton's laws of motion. 4. Apply the principles of work and energy to analyze and solve dynamic problems.

	5. Analyze and calculate linear and angular momentum, and apply the principle of impulse and momentum to dynamic systems. 6. Understand and apply the principles of vibrations and oscillations in mechanical systems. 7. Apply principles of balancing rotating masses and vibrations to ensure smooth operation of machinery. 8. Analyze multi-degree of freedom systems and determine their natural frequencies and mode shapes. 9. Apply dynamic principles to real-world engineering problems and systems. 10. Develop critical thinking and problem-solving skills in the context of engineering dynamics. 11. Communicate effectively, both orally and in writing, to present and explain the analysis, results, and solutions of dynamic problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Module Learning Outcomes for Engineering Mechanics/Dynamics: 1. Demonstrate a thorough understanding of the fundamental concepts and principles of dynamics, including motion, forces, and acceleration. 2. Apply kinematic equations to analyze the motion of particles and rigid bodies in different scenarios and determine their velocities and accelerations. 3. Analyze and calculate the forces and moments acting on particles and rigid bodies in dynamic situations, considering the principles of equilibrium. 4. Apply Newton's laws of motion to determine the relationship between forces, mass, and acceleration, and solve dynamic problems using these principles. 5. Utilize the principles of work and energy to analyze and solve dynamic problems, calculating mechanical work, kinetic energy, and potential energy. 6. Apply the principles of impulse and momentum to analyze the motion and collision of particles and rigid bodies, and solve related problems. 7. Understand the principles of vibrations and oscillations in mechanical systems, and analyze their behavior, natural frequencies, and damping effects. 8. Analyze three-dimensional motion of rigid bodies, applying Euler's equations of motion to determine their rotational and translational behavior. 9. Understand gyroscopic motion and its applications in stability and control systems, including precession and gyroscope stabilization. 10. Apply the principles of balancing rotating masses to minimize vibrations and ensure smooth operation of rotating machinery. 11. Analyze multi-degree of freedom systems, determine their natural frequencies and mode shapes, and understand their response to dynamic loading.

	12. Apply the principles and techniques learned in dynamics to solve real-world engineering problems, such as analyzing the motion and forces in mechanical systems. **13.** Demonstrate critical thinking and problem-solving skills by effectively applying dynamic principles to analyze and solve complex engineering problems. **14.** Communicate effectively, both orally and in writing, to present and explain the analysis, results, and solutions of dynamics problems. By achieving these module learning outcomes, students will have a solid foundation in engineering dynamics, enabling them to analyze and solve problems related to motion, forces, vibrations, and stability in mechanical systems. They will develop critical thinking skills, problem-solving abilities, and effective communication skills, which are essential for success in the field of engineering dynamics.
Indicative Contents المحتويات الإرشادية	Indicative Contents for Engineering Mechanics/Dynamics: **1.** Kinematics of Particles • Position, velocity, and acceleration • Rectilinear and curvilinear motion • Projectile motion • Tangential and normal components of acceleration **2.** Kinetics of Particles • Newton's laws of motion • Force, mass, and acceleration • Application of Newton's laws to particles • Frictional forces • Applications of particle kinetics **3.** Kinematics of Rigid Bodies • Rotation and angular displacement • Angular velocity and acceleration • Fixed axis rotation • General plane motion **4.** Kinetics of Rigid Bodies • Moment of inertia • Parallel-axis theorem • Angular momentum and torque • Equations of motion for rigid bodies • Applications of rigid body kinetics **5.** Work and Energy • Work done by a force • Kinetic energy and potential energy • Principle of work and energy

	• Power and efficiency • Conservative and non-conservative forces **6.** Impulse and Momentum • Linear momentum and impulse • Conservation of linear momentum • Impulse-momentum principle • Impact and collision • Applications of momentum **7.** Vibrations and Oscillations • Free and forced vibrations • Single degree of freedom systems • Damping and damping ratios • Natural frequency and resonance • Vibration isolation and control Note: The indicative contents provided above give an overview of the topics typically covered in an Engineering Mechanics/Dynamics course. The actual contents may vary depending on the specific curriculum and academic institution.

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 types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**63**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**4**

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**112**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**7**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	**5**	**15% (15)**	**2,4,9,11 and 13**	**LO #1, #3 ,#8,#9 and #10,**
	Assignments	**6**	**15% (15)**	**3,5,7,8,10 and 15**	**LO #2, #4, #5, #7, #9 , and #11**
	Projects / Lab.				
	Report	**1**	**10% (10)**	**15**	**LO #6, #12,#13 and #14**
Summative assessment	**Midterm Exam**	**2hr**	**10% (10)**	**7**	**LO #1 - #7**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) Course 1

المنهاج الاسبوعي النظري

	Material Covered
Week 1-2	Introduction to Engineering Mechanics/Dynamics • Overview of Engineering Mechanics/Dynamics • Fundamental concepts and principles • Unit conversions
Week 3-4	• Kinematics of Particles • Position, velocity, and acceleration
Week 5-6	Rectilinear motion
Week 7	Curvilinear motion
Week 8	Tangential and normal components of acceleration

Week 9-11	Projectile motion
Week 12-14	• Kinetics of Particles • Newton's laws of motion • Force, mass, and acceleration
Week 15	Application of Newton's laws to particles

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**ENGINEERING MECHANICS, STATICS AND DYNAMICS** **TWELFTH EDITION R. C. HIBBELER**	**yes**
Recommended Texts	**Theory and Problems of Engineering Mechanics** **Statics and Dynamics/ Fifth Edition, Shaum's Outline**	**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	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	**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.

Code	Course/Module Title	ECTS	Semester
AM 201	**Eng. Mechanics/ Dynamics 1**	**7**	**4**
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	**2**	**63**	**112**

Dynamics is a branch of Engineering Mechanics that focuses on the study of objects in motion and the forces that cause that motion. It builds upon the principles of statics and expands them to analyze the behavior of objects subjected to acceleration, velocity, and displacement. This field is concerned with understanding and predicting the motion of particles and rigid bodies, as well as the forces and energy associated with their motion.

The primary goal of Engineering Mechanics/Dynamics is to provide engineers with a comprehensive understanding of how objects move and interact under the influence of forces and moments. By studying dynamics, engineers can design and analyze systems such as machines, vehicles, and structures to ensure their optimal performance, efficiency, and safety.

In this subject, students explore various topics, including the kinematics and kinetics of particles and rigid bodies. Kinematics deals with the description of motion, focusing on concepts such as displacement, velocity, and acceleration. Kinetics, on the other hand, focuses on the forces and torques acting on objects, leading to their motion.

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Applications 1** (MATLAB)		**Module Delivery**		
Module Type	**core**		☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**		
Module Code	**AM205**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	**2**	**Semester of Deliver**	**4**		
Administering Department	**AM**	**College**	**TEMO**		
Module Leader	**Ayman Sabah Rashad**	**e-mail**	**Aymansabah@ntu.edu.iq**		
Module Leader's Acad. Title	**Lecturer**	**Module Leader's Qualification**	**Ph.D**		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	**23/9/2023**	**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 Objectives	**7.** Understanding the MATLAB environment **8.** Being able to do simple calculations using MATLAB **9.** Being able to carry out simple numerical computations and analyses using MATLAB

أهداف المادة الدراسية	
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After attending the module, the students **7.** are familiar with the MATLAB environment and can perform basic operations, such as simple programming, importing data and plotting graphics **8.** are able to create and combine variables (scalars, vectors, matrices) **9.** are familiar with basic numerical methods, such as numerical differentiation and integration integrals, approximate derivatives, and solving linear systems **10.** can use MATLAB solver(s) for solving differential equations **11.** Use the MATLAB GUI effectively **12.** Design simple algorithms to solve problems **13.** Know where to find help
Indicative Contents المحتويات الإرشادية	**7.** We will learn how to start MATLAB and will familiarize ourselves with its user interface. We will learn how to use MATLAB as a sophisticated calculator. We will learn about syntax and semantics. We will see ways in which MATLAB provides help. Finally, we will learn how to create plots in MATLAB. **8.** The basic unit with which we work in MATLAB is the matrix. We solve problems by manipulating matrices, and operators are the primary means by which we manipulate them. We will learn how to define matrices, extract parts of them and combine them to form new matrices. We will learn how to use operators to add, subtract, multiply, and divide matrices, and we will learn that there are several different types of multiplication and division. Finally, we will learn MATLAB's rules for determining the order in which operators are carried out when more than one of them appear in the same expression. **9.** Functions let us break up complex problems into smaller, more manageable parts. We will learn how functions let us create reusable software components that can be applied in many different programs. We will learn how the environment inside a function is separated from the outside via a well-defined interface through which it communicates with that outside world. We will learn how to define a function to allow input to it when it initiates its execution and output from it when it is done. **10.** MATLAB has useful built-in functions and we will explore many of them in this section. We will learn about polymorphism and how MATLAB exploits it to change a function's behavior on the basis of the number and type of its inputs. Because random numbers play an important role in computer programming, we will learn how to use the MATLAB random number generator. We will learn how to get input from the keyboard, how to print to the Command Window, and how to plot graphs in a Figure window. Finally, we will learn how to find programming errors with the help of the debugger. **11.** Selection is the means by which MATLAB makes decisions about the order in which it

	executes its statements. We will learn how to use the if-statement, which is the most important method of selection. We will learn how to use relational operators and logical operators. We will learn how to write polymorphic functions and how to make functions resistant to error. **12.** Loops give computers their power. We will learn how to use both of MATLAB's loop constructs: the for-loop and the while-loop. We will learn how the break-statement works, and we will use nested loops. We will learn how to make loops more efficient. We will learn about logical indexing and will see how to use it to produce implicit loops that are efficient and easy for a user to understand. **13.** Computers operate on bits, but humans think in terms of numbers, words, and other types of data. Like any good language, MATLAB organizes bits into convenient data types. We will study those types in this section. We will learn that there are ten types of numbers and that there are conversion functions to change one type into another. We will learn much more about strings and how the characters in them are encoded as numbers. We will learn how to produce heterogeneous collections of data via structures and cells, and we will learn how to store points in time and time durations. **14.** Files are named areas in permanent memory for storing data that can be used as input or output to MATLAB and to other programs. We will be introduced to MATLAB's most important methods for reading and writing files. We will learn how to create, read from, and write into MAT-files, Excel files, text files, and binary files. We will learn how to navigate among folders with MATLAB commands.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. This will be accomplished through lectures, interactive tutorials, and the consideration of various sorts of easy experiments incorporating some engaging sampling exercises for the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**78**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**5**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**72**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**5**
Total SWL (h/sem)	**150**		

الحمل الدراسي الكلي للطالب خلال الفصل	

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	3,8 and 12	LO #1, #2,#4,#5 and #6
	Assignments	2	5% (10)	2,5,10 and 14	LO #1, #3,#5 and #7
	Projects / Lab.	10	1.5% (15)	Continuous	All
	Report	1	5% (5)		
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #3
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to MATLAB
Week 2	The MATLAB environment
Week 3 &4	Matrices and operators
Week 5&6	Functions
Week 7& 8& 9	Programmer's toolbox
Week 10&11	If statement
Week 12	Loops
Week 13	Data type
Week 14	File input/output
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	MATLAB documentation https://www.mathworks.com/help/MATLAB/	No
Recommended Texts	Introduction to MATLAB for Engineering Students	No
Websites	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.

Code	Course/Module Title	ECTS	Semester
AM 205	COMPUTER PRINCIPLES	7	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/w)**
1	3	63	112
Description			
This course teaches computer programming to those with little to no previous experience. It uses the programming system and language called MATLAB to do so because it is easy to learn, versatile and very useful for engineers and other professionals. MATLAB is a special-purpose language that is an excellent choice for writing moderate-size programs that solve problems involving the manipulation of numbers. The design of the language makes it possible to write a powerful program in a few lines. The problems may be relatively complex, while the MATLAB programs that solve them are relatively simple: relative, that is, to the equivalent program written in a general-purpose language, such as C++ or Java. As a result, MATLAB is being used in a wide variety of domains from the natural sciences, through all disciplines of engineering, to finance, and beyond, and it is heavily used in industry. Hence, a solid background in MATLAB is an indispensable skill in today's job market. Nevertheless, this course is not a MATLAB tutorial. It is an introductory programming course that uses MATLAB to illustrate general concepts in computer science and programming. Students who successfully complete this course will become familiar with general concepts in computer science, gain an understanding of the general concepts of programming, and obtain a solid foundation in the use of MATLAB.			

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
Module Title	**Professional ethics**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory**	
Module Code	**NTU 204**			☐ **Lecture**	
ECTS Credits	**2**			☐ **Laboratory**	
SWL (hr/sem)	**50**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	**2**	**Semester of Deliver**		**4**	
Administering Department	**AM**	**College**		**TEMO**	
Module Leader	**Haitham M. Wadullah**	**e-mail**		**Dr.haitham@ntu.edu.iq**	
Module Leader's Acad. Title	**Prof. Dr.**	**Module Leader's Qualification**		**PhD**	
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	**23/9/2023**	**Version Number**		**1.0**	

Relation with other Modules			
Prerequisite module	**None**	**Semester**	
Co-requisites module	**None**	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	5. Understand the importance of occupational safety: The module aims to provide students with a comprehensive understanding of the significance of occupational safety in the workplace. Students will learn about the potential hazards and risks associated with different industries and the impact they can have on the well-being of employees. 6. Identify common workplace hazards: Students will learn how to identify and assess various workplace hazards, including physical, chemical, biological, and ergonomic hazards. They will gain knowledge about different types of safety hazards that exist in different work environments and how to recognize them to prevent accidents and

	injuries. 7. Implement safety protocols and practices: The module will equip students with the knowledge and skills to implement effective safety protocols and practices in the workplace. They will learn about safety regulations, standards, and best practices, and understand the importance of following safety guidelines to create a safe working environment. 8. Develop risk assessment and management skills: Students will be trained in conducting risk assessments and developing risk management strategies. They will learn how to identify potential risks, evaluate their severity and likelihood, and develop appropriate control measures to mitigate or eliminate those risks.
Module Learning Outcomes	4. Identify and assess workplace hazards: Engineering students will be able to identify and assess potential workplace hazards specific to their field of engineering. They will understand the importance of hazard identification and risk assessment in order to prevent accidents, injuries, and occupational illnesses. 5. Apply engineering principles to develop safety solutions: Students will be able to apply their engineering knowledge and skills to develop innovative and effective safety solutions. They will understand how engineering principles can be utilized to design and implement engineering controls, safety devices, and protective measures to minimize or eliminate workplace hazards. 6. Implement safety standards and regulations: Engineering students will be knowledgeable about relevant safety standards and regulations applicable to their specific engineering discipline. They will understand the importance of compliance with safety standards and be able to apply them in the design, construction, operation, and maintenance of engineering systems and processes. They will also be aware of the legal and ethical responsibilities associated with ensuring occupational safety in their professional practice.
Indicative Contents	Indicative content includes the following. **Part A - Theory** Introduction to Occupational Safety, Identifying and Assessing Risks, Engineering Controls and Safety Systems, Personal Protective Equipment and Safety, Equipment Occupational Health and Industrial Health [10 hrs] Fire Safety and Emergency Preparedness, Electrical Safety in Engineering Machine and Equipment, Safety Construction, Safety in Engineering Projects, Hazardous Materials Management [10 hrs] Revision problem classes [2 hrs] **Part B – Practice** Training and Communication in Engineering Safety Incident Investigation and Reporting in Engineering Safety Management Systems in Engineering Application in Occupational Safety 1 Application in Occupational Safety 2. [10 hrs]

Learning and Teaching Strategies	
Strategies	5. Familiarize yourself with the subject: Start by understanding the key concepts, principles, and regulations related to Occupational Safety in the engineering field. This will provide a foundation for further exploration and learning. 6. Actively engage in practical applications: Apply the theoretical knowledge to real-world scenarios by analyzing case studies, conducting risk assessments, and identifying safety measures in engineering projects. This hands-on approach will help reinforce understanding and develop problem-solving skills. 7. Collaborate and discuss: Engage in discussions and group activities with fellow engineering students. Share experiences, exchange ideas, and learn from each other's perspectives. This collaborative learning environment can broaden your understanding and provide different insights into safety practices. 8. Stay updated with industry standards: Keep yourself informed about the latest safety regulations, codes, and standards relevant to the engineering field. Regularly refer to authoritative sources such as government agencies, professional organizations, and reputable publications to stay up-to-date with best practices.

Student Workload (SWL)			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**32**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**(32/15) = 2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**18**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**(18/15) = 1**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**1**	**10% (10)**	**5 and 10**	**LO #2**
	Assignments	**1**	**10% (10)**	**2 and 12**	**LO #3**
	Projects / Lab.				
	Report	**2**	**20% (20)**	**8 and 13**	**LO #1 and LO #2**
Summative	**Midterm Exam**	**1hr.**	**10% (10)**	**7**	**LO #1 - #2**

assessment	**Final Exam**	**2hr.**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مقدمة في السلامة المهنية
Week 2	تحديد المخاطر وتقييم المخاطر
Week 3	وسائل السيطرة الهندسية وأنظمة السلامة
Week 4	معدات الحماية الشخصية ومعدات السلامة
Week 5	الصحة المهنية والصحة الصناعية
Week 6	سلامة الحرائق والاستعداد للطوارئ
Week 7	سلامة الكهرباء في الهندسة
Week 8	سلامة الآلات والمعدات
Week 9	سلامة البناء في مشاريع الهندسة
Week 10	إدارة المواد الخطرة
Week 11	التدريب والتواصل في سلامة الهندسة
Week 12	تحقيق الحوادث وتقاريرها في الهندسة
Week 13	أنظمة إدارة السلامة في الهندسة
Week 14	تطبيق في السلامة المهنية ١
Week 15	تطبيق في السلامة المهنية٢
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	**No**

Learning and Teaching Resources		
	Text	**Available in the Library?**

Required Texts	٨. "السلامة والصحة المهنية" بواسطة علي عبد العزيز المرزوقي. ٩. "السلامة والصحة المهنية في البناء والتشييد" بواسطة فوزي عطا الله. ١٠. "السلامة والصحة المهنية والبيئية" بواسطة مجدي الغول. ١١. "السلامة المهنية وإدارة المخاطر" بواسطة سلطان القحطاني. ١٢. "السلامة المهنية والوقاية من المخاطر" بواسطة نزار السعودي. ١٣. "السلامة المهنية والحريق" بواسطة حسن السناني. ١٤. "السلامة والصحة المهنية في المعامل" بواسطة عمرو حسين.	**Yes**
Recommended Texts	5. "Occupational Safety and Health for Technologists, Engineers, and Managers" بواسطة David L. Goetsch و Eugene R. Pierce. 6. "Introduction to Occupational Health in Public Health Practice" بواسطة Bernard D. Goldstein و Mary Sue Henifin. 7. "Safety and Health for Engineers" بواسطة Roger L. Brauer. 8. "Occupational Safety and Health for Technologists, Engineers, and Managers" بواسطة David L. Goetsch و Eugene R. Pierce.	**No**
Websites	7. No Occupational Safety and Health Administration (OSHA): The official website of OSHA, a government agency responsible for enforcing workplace safety regulations in the United States. It offers a wealth of resources, guidelines, and educational materials on various safety topics. 8. National Institute for Occupational Safety and Health (NIOSH): NIOSH is a U.S. federal agency focused on conducting research and providing guidance on occupational safety and health. Their website offers publications, databases, training materials, and tools related to workplace safety. 9. Health and Safety Executive (HSE): HSE is the national independent regulator for workplace health and safety in the United Kingdom. Their website provides guidance, publications, and tools to help businesses and individuals understand and comply with health and safety regulations. 10. Centers for Disease Control and Prevention (CDC): While primarily focused on public health, the CDC also offers resources and information on occupational safety and health. Their website provides research, guidelines, and educational materials on various workplace safety topics. 11. Canadian Centre for Occupational Health and Safety (CCOHS): CCOHS is a Canadian organization dedicated to promoting occupational health and safety. Their website offers a wide range of resources, including fact sheets, guidelines, courses, and databases related to workplace safety. 12. European Agency for Safety and Health at Work (EU-OSHA): EU-OSHA is an agency of the European Union focused on promoting safety and health in the workplace. Their website provides information, publications, and tools to help improve workplace safety across Europe	

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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Code	Course/Module Title	ECTS	Semester
NTU 204	Professional Ethics	2	4
Class (hr/w)	**Lect/Lab./Prac./Tutor**	**SSWL (hr/sem)**	**USWL (hr/sem)**
2	0	32	18

Description

السلامة المهنية هي مجال دراسة يركز على تحقيق بيئة عمل آمنة وصحية للعاملين في جميع الصناعات والقطاعات. يهدف العلماء والباحثون في هذا المجال إلى تحليل وتقييم المخاطر المحتملة في مكان العمل وتطوير وتنفيذ استراتيجيات وأنظمة للوقاية والتحكم في هذه المخاطر. تشمل مجالات الدراسة في السلامة المهنية تحديد المخاطر، وتقييم المخاطر، وتصميم وتنفيذ إجراءات السلامة والوقاية، والتدريب والتثقيف، وإدارة الحوادث والطوارئ، والتشريعات والمعايير الخاصة بالسلامة. يهدف العلماء والمهنيين في هذا المجال إلى تعزيز ثقافة السلامة ورفع الوعي بأهمية السلامة المهنية بين العاملين وصناعة الأعمال بشكل عام. تعد السلامة المهنية جزءًا أساسيًا من الإدارة الفعالة للمخاطر وتساهم في تحسين الأداء العام والجودة ورفاهية العاملين في بيئة العمل.