

دليل البرنامج الدراسي 2025 - 2026

URUK University
جامعة اوروك



الدورة الثانية
بكالوريوس - قسم هندسة تقنيات الحاسوب

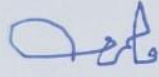


نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة أروك
الكلية / المعهد: الكلية التقنية الهندسية
القسم العلمي: قسم تقنيات هندسة الحاسوب
اسم البرنامج الأكاديمي أو المهني: بكالوريوس
اسم الشهادة النهائية: بكالوريوس في تقنيات هندسة الحاسوب
النظام الدراسي: بولونيا (مرحلة أولى + مرحلة ثانية + مرحلة ثالثة + مرحلة رابعة)

تاريخ اعداد الوصف : 2026 / 08 / 30

تاريخ ملئ الملف: 2026 / 09 / 01

التوقيع : 

اسم المعاون العلمي: أ.م.د. فالح حمزة عيدان

التاريخ : 6 / 9 / 2026

التوقيع : 

اسم رئيس القسم: م.د مصطفى خليل ابراهيم

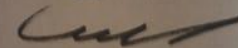
التاريخ : 6/9/2026

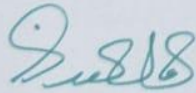
دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: م.د. سعدية حسن هلوس

التاريخ : 2026/9/8

التوقيع : 



مصادقة السيد العميد

أ.د. وليد امين الجوهر

جدول المحتويات

جدول المحتويات

1. بيان المهمة والرؤية
2. مواصفات البرنامج
3. أهداف البرنامج
4. مخرجات تعلم الطالب
5. الهيئة التدريسية
6. الاعتمادات والدرجات والمعدل التراكمي
7. المواد الدراسية
8. الاتصال

1. بيان المهمة والرؤية

رؤية البرنامج:

أن نكون رائدين في التعليم التقني والبحث التطبيقي في هندسة الحاسوب، وإعداد مهنين مبتكرين يقودون مجتمع المعرفة والتحول الرقمي.

رسالة البرنامج:

تقديم تعليم تقني عالي الجودة يدمج النظرية بالمهارات العملية، وتهيئة بيئة للابتكار والبحث لتلبية متطلبات السوق المتطورة وخدمة المجتمع.

2. مواصفات البرنامج

- رمز البرنامج BSc- ATE :
- نظام الوحدات الأوروبي 240 (ECTS) وحدة
- مدة الدراسة 4 :مستويات، 8 فصول دراسية
- طبيعة الدوام :دوام كامل

يحتوي هذا المستند على مواصفات برنامج شاملة مصممة لبرنامج البكالوريوس في تقنيات هندسة الحاسوب، حيث يوازن بين النظرية الأكاديمية والتركيز المكثف على التطبيق التقني والعملية.

- **التعريف بالبرنامج:** إطار مؤسسي رسمي يمنح درجة البكالوريوس في الهندسة التقنية.
- **الأهداف التعليمية:** معايير مستهدفة مصممة لإنتاج مهندسين تقنيين مبتكرين ومستعدين لسوق العمل.
- **مخرجات التعلم المستهدفة (ILOs):** مقسمة إلى المعرفة والفهم، المهارات الإدراكية، والقدرات العملية والمهنية (مثل إعداد الأجهزة، البرمجة، والشبكات).
- **مصفوفة المنهج الدراسي لأربع سنوات:** نظرة عامة سنوية متدرجة توضح المواد الأساسية وتتطور لتشمل الأنظمة المدمجة، شبكات الحوسبة السحابية، الأمن السيبراني، ومشروع التخرج الإلزامي.
- **معايير التدريس والتقييم:** إجراءات تقييم متوازنة تقسم المعايير بين الأداء المختبري المستمر، الامتحانات النظرية، والاختبارات الشفهية العملية.

3. أهداف البرنامج

أهداف برنامج درجة البكالوريوس في تقنيات هندسة الحاسوب، المهيكلة لتلبية معايير الاعتماد الأكاديمي والصناعي الحديثة:

1. الكفاءة التقنية والجاهزية لسوق العمل:

- تزويد الطلاب بمهارات نظرية وعملية قوية.
- إتقان تصميم الأجهزة، تطوير البرمجيات، وبنية الشبكات.
- إعداد الخريجين لنشر حلول حوسبة مبتكرة في بيئات العالم الحقيقي.

2. الابتكار والبحث التطبيقي:

- تعزيز التفكير النقدي وحل المشكلات الهندسية المتقدمة.
- تشجيع البحث التطبيقي الذي يستهدف التحديات التقنية المحلية والعالمية.
- قيادة الابتكار في المجالات الناشئة مثل الذكاء الاصطناعي، إنترنت الأشياء، والأمن السيبراني.

3. المهنية والقيادة:

- تنمية قدرات قوية في إدارة المشاريع والتعاون الجماعي.
- غرس المعايير الأخلاقية العالية، المسؤولية الاجتماعية، والنزاهة المهنية.
- تطوير مهارات الاتصال اللازمة لقيادة الفرق الهندسية التقنية.

4. النمو المستمر والتكيف:

- تعزيز عادات التعلم مدى الحياة لمواكبة التحولات الرقمية السريعة.
- مواكبة مخرجات التعلم مع التحولات التكنولوجية العالمية.

- تمكين الخريجين من متابعة الدراسات العليا المتقدمة بسلاسة.

5. الشراكة المجتمعية والصناعية:

- جسر الفجوة بين التعليم الأكاديمي والاحتياجات الصناعية.
- تقديم الاستشارات الفنية والتدريب والخدمات للقطاعات المجتمعية.
- دعم مبادرات التحول الرقمي عبر المؤسسات المحلية.

4. مخرجات تعلم الطالب

- **المخرج 1: فهم المعرفة ذات الصلة:** سيكون الخريجون قادرين على إظهار فهم عميق للمعرفة والقدرات والكفاءات التي يحتاجها سوق العمل، كما أنهم على دراية بالتطورات في مجال التكنولوجيا والأعمال.
- **المخرج 2: التواصل الشفهي والكتابي:** سيكون الخريجون قادرين على استخدام قدراتهم في التواصل الشفهي والكتابي لنقل نتائج استكشاف أخطاء وإصلاحها لأجهزة الطائرات بشكل احترافي.
- **المخرج 3: المهارات التقنية والإدراكية:** يمكن للخريجين إنشاء تطبيقات لفحص النتائج أو التحكم فيها وبناء دوائر لمعدات الطائرات بناءً على معايير محددة مسبقاً.
- **المخرج 4: التفكير النقدي والمهارات التحليلية:** سيكون الخريجون قادرين على التعرف على المشكلات الجديدة ومحاولة معالجتها باستخدام تقنيات النمذجة والتصميم والتنبؤ القائمة على التفكير المنطقي والنقدي.
- **المخرج 5: أدوات وتقنيات البحث المناسبة:** سيكون الخريجون قادرين على استخدام تقنيات البحث الأساسية لإجراء مجموعة متنوعة من التطبيقات العلمية، ولتحقيق المخرجات المقصودة، قد يقوم الخريج بتعديل واكتساب قدرات جديدة.
- **المخرج 6: مهارات الاتصال وتكنولوجيا المعلومات:** من أجل تحديد الحل الأفضل، يمكن للخريجين تبادل المعلومات مع الفريق الفني، كما يمكنهم الاستفادة من تكنولوجيا الاتصالات والمعلومات والإنترنت. يمكن للخريجين قراءة وفهم التعليمات وأدلة المستخدم لمجموعة متنوعة من الأجهزة الطبية، ويستخدمون مجموعة متنوعة من العبارات الطبية باللغة الإنجليزية للتفاعل مع غير المتخصصين مع إظهار فهم للمستويات المعلوماتية ووجهات النظر المتنوعة.
- **المخرج 7: قيادة المجموعة/الفريق:** سيكون الخريجون مدفعين ذاتياً، ويتعاونون جيداً مع المهنيين من مختلف المجالات والخلفيات والاهتمامات لحل المشكلات، ويعملون بوضوح تحت الضغط في المواقف المعقدة، ويظهرون معرفة والتزاماً باتباع بروتوكولات السلامة لأنفسهم وللآخرين.
- **المخرج 8: التطوير المهني الذاتي:** يمكن للخريجين التخطيط وحل المشكلات واتخاذ القرارات والحفاظ على المعرفة المهنية الحالية.

• الهيئة التدريسية

• **مصطفى خليل إبراهيم** //مدرس / دكتوراه في هندسة الاتصالات

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• **حسن رافد محمود** //مدرس / ماجستير في هندسة الحاسوب

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6. الاعتمادات والدرجات والمعدل التراكمي

الاعتمادات: (Units)

تتبع جامعة أروك مسار بولونيا مع نظام تحويل الوحدات الأوروبي (ECTS) إجمالي عدد وحدات البرنامج لنيل الدرجة هو 240 وحدة، بمعدل 30 وحدة لكل فصل دراسي. الوحدة الواحدة (1 ECTS) تعادل 30 ساعة من العبء الدراسي للطالب، بما في ذلك العبء الدراسي المهيكّل وغير المهيكّل.

الدرجات: (Grading)

قبل التقييم، يتم تقسيم النتائج إلى مجموعتين فرعيتين: ناجح وراسب. لذلك، فإن النتائج مستقلة عن الطلاب الذين رسبوا في المادة. يتم تعريف نظام الدرجات كالتالي:

التعريف	الدرجات (%)	التقدير	الدرجة	المجموعة
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أداء متميز	90 - 100 امتياز	A - Excellent	مجموعة النجاح (50 - 100)
أعلى من المتوسط مع بعض الأخطاء	80 - 89 جيد جداً	B - Very Good	
عمل جيد مع أخطاء ملحوظة	70 - 79 جيد	C - Good	
مقبول ولكن مع عيوب رئيسية	60 - 69 متوسط	D - Satisfactory	
العمل يلبي الحد الأدنى من المعايير	50 - 59 مقبول	E - Sufficient	
مطلوب المزيد من العمل ولكن تمنح الوحدة	(45 - 49) راسب - قيد المعالجة	FX - Fail	مجموعة الرسوب (0 - 49)
مطلوب حجم كبير من العمل	(0 - 44) راسب	F - Fail	

ملاحظة: يتم تقريب الأرقام العشرية التي تساوي أو تزيد عن 0.5 إلى الدرجة الكاملة الأعلى، بينما يتم تقريب الأرقام الأقل من 0.5 إلى الدرجة الكاملة الأقل (على سبيل المثال، الدرجة 54.5 تقرب إلى 55، في حين أن الدرجة 54.4 تقرب إلى 54). تتبع الجامعة سياسة عدم التغاضي عن "الرسوب القريب من النجاح"، لذا فإن التعديل الوحيد على الدرجات الممنوحة من قبل المصحح الأصلي سيكون التقريب التلقائي الموضح أعلاه.

(CGPA): احتساب المعدل التراكمي العام

يتم احتساب المعدل التراكمي العام عن طريق مجموع حاصل ضرب درجة كل مادة في وحداتها، مقسوماً على إجمالي وحدات البرنامج (ECTS).
المعدل التراكمي لدرجة البكالوريوس لمدة 4 سنوات

$$CGPA = [(1^{st} \text{ module score} \times ECTS) + (2^{nd} \text{ module score} \times ECTS) + \dots] / 240$$

بكالوريوس - قسم هندسة تقنيات الحاسوب

(السنة الاولى)

Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr

Program Curriculum (2023 - 2024)

First Year // Semester 1 | 30 ECTS | 1 ECTS = 25 hr.

Course Code	اسم المادة الدراسية	Theoretical (Hrs/Wk)	Practical/Lab (Hrs/Wk)	Total Credits (ECTS/Units)
CET1101	مبادئ الرقمية	2	2	6.00
CET1102	مبادئ الهندسية الكهربائية	2	2	6.00
CET1103	الرياضيات I	2		5.00
CET1104	الرسم الهندسي		3	5.00
CET1105	الورش الهندسية		4	6.00
MTU1002	اللغة الإنكليزية 1	1	1	2.00

Semester 2 | 30 ECTS | 1 ECTS = 25 hr.

Course Code	اسم المادة الدراسية	Theoretical (Hrs/Wk)	Practical/Lab (Hrs/Wk)	Total Credits (ECTS/Units)
CET1201	الانظمة الرقمية	2	2	6
CET1202	الدوائر الكهربائية	2	2	6
CET1203	أساسيات البرمجة	2	2	6
CET1204	II الرياضيات	2	1	5
MTU1006	الديمقراطية و حقوق الانسان	2		2
MTU1001	اللغة العربية	2		2
MTU1004	اساسيات الحاسوب	1	1	3

السنة الثانية

Semester (3) | 30 ECTS | 1 ECTS = 25 hr.

Course Code	اسم المادة الدراسية	Theoretical (Hrs/Wk)	Practical/Lab (Hrs/Wk)	Total Credits (ECTS/Units)
CET2101	الرياضيات الهندسية	2	1	5
CET2102	البرمجة الكيانية	2	3	6
CET2103	تركيب الحاسوب وتطبيقاته	2	2	5
CET2104	مبادئ الالكترونيك	2	2	5
CET2105	اسس الاتصالات	2	2	5
MTU1003	اللغة الإنكليزية 2	1	1	2
MTU1007	جرائم نظام البعث	2		2

Semester (4) | 30 ECTS | 1 ECTS = 30 hr.

Course Code	Module / Course Title	Theoretical (Hrs/Wk)	Practical/Lab (Hrs/Wk)	Total Credits (ECTS/Units)
CET2201	Advanced Engineering Mathematics	2	1	5
CET2202	Python Programming	2	2	4
CET2203	Microprocessors	2	2	5
CET2204	Analog Communications	2	2	5
CET2205	Electronics Circuits	2	2	5
CET2206	Instrumentation and Measurement	2	2	4
MTU1009	Arabic Language II	2		2

السنة الثالثة

Semester 5 | 30 ECTS | 1 ECTS = 30 hr.

Course Code	اسم المادة	Theoretical (Hrs/Wk)	Practical/Lab (Hrs/Wk)	Total Credits (ECTS/Units)
CET3101	الرياضيات الهندسية المتقدمة	2	2	5
CET3102	البرمجة بلغة بايثون	2	2	5
CET3103	المعالجات الدقيقة	2	2	5
CET3104	الاتصالات التماثلية	2	2	5
CET3105	الدوائر الالكترونية	2	2	5
CET31XX	الاجهزة و القياس	2	2	5

Semester 6 | 30 ECTS | 1 ECTS = 30 hr.

Course Code	اسم المادة	Theoretical (Hrs/Wk)	Practical/Lab (Hrs/Wk)	Total Credits (ECTS/Units)
CET3201	انظمة التشغيل	2	2	5
CET3202	اسس هندسة السيطرة	2	2	5
CET3203	معالجة الاشارة الرقمية	2	2	5
CET3204	المسيطرات الدقيقة	2	2	5
CET3205	الاتصالات الرقمية	2	2	5
CET32XX	مادة اختيارية	2	2	5

السنة الرابعة

Semester 7 | 30 ECTS | 1 ECTS = 30 hr.

Course Code	اسم المادة	Theoretical (Hrs/Wk)	Practical/Lab (Hrs/Wk)	Total Credits (ECTS/Units)
CET4101	انظمة السيطره المتقدمة	2	2	6
CET4102	اساسيات شبكات الحاسوب	2	2	6
CET4103	قواعد البيانات	2	2	6
CET4104	التحليلات الهندسية	2	2	5
MTU1008	اتصالات البيانات	2		2
CET41XX	مادة اختيارية	2	2	5

Semester 8 | 30 ECTS | 1 ECTS = 30 hr.

Course Code	اسم المادة	Theoretical (Hrs/Wk)	Practical/Lab (Hrs/Wk)	Total Credits (ECTS/Units)
CET4201	نظرية المعلومات و الترميز	2	2	5
CET4202	بروتوكولات شبكات الحاسوب	2	2	5
CET4203	الاتصالات المتنقلة	2	2	5
CET4204	الادارة الهندسية	2	2	5
CET4205	اخلاقيات المهنة		4	5
CET42XX	مادة اختيارية	2	2	5

8. Information contact:

Program manager:

Mustafa Khaleel Ibrahim // Lech./PhD. In Communication Engineering

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Program organizer:

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Digital Fundamentals		Module Delivery
Module Type	Core		✓ Theory Lecture ✓ Lab Tutorial Practical Seminar
Module Code	CET1101		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To be able to deal with the number systems and codes. 2. To understand the functionality of logic gates. 3. To have a skill to use the logic gates in designing logic circuit. 4. To have a skill to simplify the digital circuits. 5. To learn the simplification process, Boolean expression, Demorgans law, and Karnaugh map.. 6. To understand the principles for designing logic circuit. 7. To understand adder, subtractor, decoder, incoder, multiplexer, demultipleaer, and comparator circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize each type of number systems. 2. Identify the process of converting between number systems. 3. Summarize the types of logic gates. 4. Discuss the use of each gate. 5. Describe design of logic circuit by using logic gats. 6. Explain the simplification processes. 7. Explain Boolean expression and Demorgan's law. 8. Explain the Karnaugh map for different numbers of bits. 9. Discuss the design of logic circuit before and after simplification. 10. Explain the combinational logic circuit.

	11. Identify the adder, subtractor, decoder, encoder, multiplexer, demultiplexer, comparator circuits, and code conversion. 12. Identify the basic circuit elements and their applications
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. --Number systems - decimal, binary, octal, and hexadecimal number system, conversion, operation. [8 hrs] -Codes- excess-3,gray code, conversions, operations, complements [8 hrs] --Logic gates-NOT, AND, OR, NOR, NAND, XOR, XNOR. [5 hrs] --Logic simplification-Boolean theorem and Demorgans law. [10 hrs] --Karnaugh map-SOP, POS, and don't care. [10 hrs] --Arithmetic operations Part A- adder, parallel binary adder, subtractor, adder-subtractor . [10 hrs] --Arithmetic operations Part B- multiplexer, demultiplexer, decoder, encoder, comparator, and code conversion. [10 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب موزع على 15 اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.73
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Number systems (decimal, binary, octal, conversions, operations)
Week 2	Number systems (hexadecimal, BCD, conversions, operations)
Week 3	Number systems (excess-3, gray code, conversions, operations, complements)
Week 4	Logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR)
Week 5	Logic simplification (Boolean theorem)
Week 6	Logic simplification (Demorgan's theorem)
Week 7	Karnaugh maps (2-variables, 3-variables,)
Week 8	Karnaugh maps (4-variables (SOP, POS, don't care))
Week 9	Karnaugh maps (5-variables, (SOP, POS, don't care))
Week 10	Midterm exam
Week 11	Arithmetic operations
Week 12	Arithmetic operations (decoder, encoder)
Week 13	Arithmetic operations (Multiplexer, Demultiplexer)
Week 14	Arithmetic operations (comparators)
Week 15	Arithmetic operations (code conversion)

Week 16	Preparatory week before the final Exam
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Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	logic gates (NOT, AND,OR)
Week 2	Logic gates (NOR.NAND)
Week 3	Logic gates (XOR,XNOR)
Week 4	Boolean theorem
Week 5	Demorgan's law
Week 6	Karnaugh map
Week 7	SOP
Week 8	POS, don't care
Week 9	Combinational circuit (half adder, full adder)
Week 10	Combinational circuit (Half subtractor, full subtractor)
Week 11	Decoder and Encoder circuits
Week 12	Multiplexer and Demultiplexer circuits
Week 13	Comparator circuit
Week 14	Code conversion circuits

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Digital Fundamentals by Floyed	Yes
Recommended Texts	Digital circuit analysis and design with Simulink modeling by Steven T. Karris	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Electrical Engineering Fundamentals	Module Delivery	
Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET1102		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1		
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims	
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أهداف المادة الدراسية	8. To develop problem solving skills and understanding of circuit theory through the application of techniques. 9. To understand voltage, current and power from a given circuit. 10. This course deals with the basic concept of electrical circuits. 11. This is the basic subject for all electrical and electronic circuits. 12. To understand Kirchhoff's current and voltage Laws problems. 13. To perform Thevenin's Norton's Theorem.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	13. Recognize how electricity works in electrical circuits. 14. List the various terms associated with electrical circuits. 15. Summarize what is meant by a basic electric circuit. 16. Discuss the reaction and involvement of atoms in electric circuits. 17. Describe electrical power, charge, and current. 18. Define Ohm's law. 19. Identify the basic circuit elements and their applications. 20. Discuss the operations of DC circuits in an electric circuit. 21. Discuss the various properties of resistors. 22. Explain the two Kirchhoff's laws used in circuit analysis. 23. Identify the basic circuit elements, Maximum Power Transfer Theorem and Reciprocity Theorem. 24. Describe Thevenin's theorem and Norton's theorem and how they work
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- Definition: Symbols and Abbreviations, Units, Electric Circuit & It's Element. The Direct Current Network. , Ohms low, Charge, Force, Work, Power.(20 hr) 2-Circuit Theory: DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction (20 hr) 3-Revision problem classes : Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, Conversion Delta To Star Connection, Superposition Method, Maximum Power Transfer Theorem, Reciprocity Theorem (20 hr)
Learning and Teaching Strategies	

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.733
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Symbols And Abbreviations, Units, Electric Circuit & It's Element.
Week 2	The Direct Current Network. Ohms low.
Week 3 and Week 4	Series Circuits (Resistance in Series) Voltage Divider Rule.
Week 5	Parallel Circuits(Resistances in Parallel) Current Divider Rule.
Week 6	Open and Short Circuits, Source Transformation,
Week 7	Series-Parallel Circuits Transformation.
Week 8	Kirchhoff's Laws: - Kirchhoff's current law (KCL) and. Their Use In Network Analysis.
Week 9	Kirchhoff's voltage law (KVL).and Their Use In Network Analysis
Week 10	Midterm exam
Week 11	Conversion Delta To Star Connection And Conversion Star To Delta Connection ,
Week 12	Superposition Method ,
Week 13	Thevenin's Theorem , Norton's Theorem
Week 14	Maximum Power Transfer Theorem
Week 15	Reciprocity Theorem

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	How to use ammeter, voltmeter and ohmmeter.
Week 2	Apply Ohm's Law
Week 3	Apply Kirchhoff's law to measure current
Week 4	Apply Kirchhoff's law to measure voltages
Week 5	Superposition Method
Week 6	Norton's Theorem.

Week 7	Thévenin's Theorem.	
Week 8	Delta To Star Connection And Conversion Star To Delta Connection	
Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Mathematics I		Module Delivery
Module Type	Support or related learning activity		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	CET1103		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	1. This course deals with differential and integral calculus. 2. To develop problem solving skills and understanding of preliminaries to differential calculus. 3. To understand differentiation, and differentiation methods. 4. To perform applications using the derivative. 5. To get a good grasp of Integrals, and Integration methods. 6. To understand the relationship between differentiation and integration.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Line and Circle Equation and related evaluating formulas. 2. List the various terms associated with Functions and their Types. 3. Discuss the Limit and Continuity of a Function. 4. Describe the Definition of a derivative as a limit, Differentiation Rules, and various types of Function's Derivatives. 5. Identify when to use different Differentiation Methods. 6. Discuss the Curve Sketching process, and the L'Hospital's Rule. 7. Analyze Taylor and Maclaurin Series. 8. Identify the Indefinite Integrals. 9. Explain the Integration Methods u-substitution, By parts. 10. Explain the Integration Methods Involving Trigonometric Functions, Trigonometric substitution. 11. Explain the Integration Method Rational Functions by Partial Fractions. 12. Explain the Integration Methods Functions Involving Roots, and Functions Involving Quadratics. 13. Recognize the Definite Integral and its Application Area Under a Curve. 14. Discuss the Definite Integral Applications Arc Length, Average Value of a Function. 15. Discuss the Definite Integral Applications Areas Between Two Curves.
Indicative Contents المحتويات الإرشادية	<u>Part A - Preliminaries to differential calculus.</u>

	This part includes the Line and Circle Equation and related evaluating formulas and parameters. Furthermore, main mathematical Functions characteristics Domain, Range, Odd, Even, and their Types. Finally, The Limit and Continuity of a Function Laws, the behavior At Infinity, followed by important Special Limits, then the Continuity Conditions. [9 hrs] + Revision problem classes in weekly tutorials [3 hrs] <u>Part B – Differential calculus.</u> This part will take in details the first key subject of the semester, the Differentiation process from the prospective of Definition as limit, Differentiation Rules, and Function-Derivative Table. Which will be followed by Differentiation Methods namely the Implicit, Logarithmic, and The Chain Rule. Furthermore, four Applications of differentiation will be discussed the Curve Sketching, L'Hospital's Rule, and Taylor and Maclaurin Series. [12 hrs] + Revision problem classes in weekly tutorials [5 hrs] <u>Part C – Integral calculus.</u> This part discusses the second key subject the Integration of functions. Followed by dissecting the main Integration Methods, u-substitution, By parts, Involving Trigonometric Functions, Trigonometric substitution, Rational Functions by Partial Fractions, Functions Involving Roots, and Functions Involving Quadratics. Furthermore, it will consider six definite Integral applications, namely The Area Under a Curve, Arc Length, Average Value of a Function, and Areas Between two Curves. [22 hrs] + Revision problem classes in weekly tutorials [8 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This module will primarily focus on encouraging students to participate in the activities, as well as refining and developing their critical thinking skills. This will be achieved through lectures, tutorials, discussions, and grading activities.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على 15 اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Line and Circle Equation. Functions (Domain, Range, Odd, Even, Types.)

Week 2	The Limit and Continuity of a Function (Laws, At Infinity, Special Limits, Continuity Conditions.)
Week 3	Differentiation (Definition as limit, Differentiation Rules, Function-Derivative Table.)
Week 4	Differentiation Methods (Implicit, Logarithmic, The Chain Rule.)
Week 5	Midterm Exam
Week 6	Applications of Differentiation (Curve Sketching, L'Hospital's Rule.), Applications of Differentiation (Taylor and Maclaurin Series.)
Week 7	Introduction to Indefinite Integrals, Integration Methods (u-substitution, By parts.)
Week 8	Integration Methods (Involving Trigonometric Functions, Trigonometric substitution.)
Week 9	Integration Methods (Integration of Rational Functions by Partial Fractions.)
Week 10	Midterm Exam
Week 11	Integration Methods (Functions Involving Roots, Functions Involving Quadratics.)
Week 12	Midterm Exam
Week 13	Definite Integral and Applications (Definite Integral, Area Under a Curve.)
Week 14	Definite Integral and Applications (Arc Length, Average Value of a Function.)
Week 15	Definite Integral and Applications (Areas Between two Curves)
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Tutorial)

المنهاج الاسبوعي الاضافي

	Material Covered
Each week, a question sheet related to the material presented in the theoretical lecture will be solved and debated.	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Joel R. Hass, Christopher E. Heil, Maurice D. Weir, "Thomas' Calculus: Early Transcendentals", Pearson Education, 14th Edition, (January 1, 2017), ISBN-13: 978-0134439020.	Yes
Recommended Texts	Anthony Croft, Robert Davison, "Mathematics for Engineers: A Modern Interactive Approach", Prentice Hall, 3rd edition, (January 1, 2008), ISBN-13: 978-0132051569.	No
Websites	https://www.khanacademy.org/math/differential-calculus	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Drawing		Module Delivery
Module Type	Support or related learning activity		☐ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET1104		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	14. To develop spatial visualization skills: Enhance your ability to visualize and mentally manipulate objects in three-dimensional space based on two-dimensional drawings. Strengthen your spatial awareness and improve your understanding of complex engineering design 15. Learn sketching and taking field dimensions. 16. Take data and transform it into graphic drawings. 17. Learn basic engineering drawing formats. 18. Learn basic AutoCAD skills. 19. Learn how to draw 2D drawings in AutoCAD.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	25. Identify the basic of AutoCAD 26. Explain Drawing settings 27. How to drawing: Point, Line, Multiline, P line, Spline, X line, Rectangle. 28. How to drawing: Donut, Polygon, Circle, Arc, Ellipse 29. List Modify Tools Identify: Erase, Undo, Redo, Explode, Move, Copy, Rotate, Mirror, 30. Identify Array, Align, Scale, Stretch, Lengthen, Trim, Extend, Break, Join, Chamfer, Fillet. 31. Explain Zoom, Pan. 32. How to assign: Dimension - Linear, Aligned, Radius, Diameter, Center Mark, Angle, Arc length, Continuous, Baseline, Tolerance, Dimension Space, Dimension Break, Jogged radius, Ordinate dimensions. 33. Dealing with: Text, Style, M text, Scale text, Spell, 34. Knowing the Hatching Objects. 35. Drawing 3d modeling. 36. Drawing the Exercises .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following.

	--AutoCAD Software, drawing settings, Drawing Tools, Line, Circle, Arc, Ellipse, Donut, Polygon, Rectangle, Point, Multiline, P line, Spline, X line. [20 hrs.] --Modify Tools Erase, Undo, Redo, Explode, Move, Copy, Rotate, Mirror, Array, Align, Scale, Stretch, Lengthen, Trim, Extend, Break, Join, Chamfer, Fillet. [4 hrs.] --Display Control Zoom, Pan, Redraw, Clean Screen. [4 hrs.] --Dimension - Linear, Aligned, Radius, Diameter, Center Mark, Angle, Arc length, Continuous, Baseline, Tolerance, Dimension Space, Dimension Break, Jogged radius, Ordinate dimensions. [4 hrs.] --Hatching Objects [4hrs] --Text, Style, M text, Scale text, Spell, [4 hrs.] --3D MODELLING, Convert 2D to 3D, Solid Editing [20 hrs.]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Familiarize with the Software: Before diving into engineering drawing concepts, it's important to become familiar with the AutoCAD software. This includes understanding the user interface, basic tools, and commands. with introductory tutorials or online resources that cover the basics of AutoCAD. 2. Step-by-Step Instructions: Break down complex drawing tasks into smaller, manageable steps. Provide step-by-step instructions and demonstrations using AutoCAD, showing students how to execute each step effectively. This approach helps students understand the workflow and build their confidence. 3. Visual Aids and Examples: Utilize visual aids, such as slides, diagrams, and examples, to reinforce concepts. Show real-world engineering drawings and explain how they were created using AutoCAD. Visual representations can enhance understanding and make abstract concepts more tangible.
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4. **Group Activities and Collaboration:** Promote collaboration among students by assigning group activities or projects. This allows them to work together, share knowledge, and learn from one another. Encourage students to discuss their approaches and problem-solving techniques related to engineering drawing in AutoCAD.
5. **Provide Feedback:** Regularly provide constructive feedback on students' drawings. Highlight areas for improvement, suggest alternative methods, and point out common mistakes. This feedback loop is crucial for students to refine their skills and develop a deeper understanding of engineering drawing principles.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على 15 اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 11	LO #1-3, 4 and 11
	Assignments	2	10% (10)	4,11	1-3 , 3-10
	Projects / Lab.	10	20% (20)	Continuous	
	Report				
	Midterm Exam	3 hr	10% (10)	7	LO # 1-7

Summative assessment	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introducing of Engineering Drawing
Week 2	Drawing settings of AutoCAD
Week 3	Drawing Tools Point, Line ,Multiline, P line, Spline, X line.
Week 4	Rectangle, Donut, Polygon
Week 5	Circle, Arc, Ellipse
Week 6	Modify Tools Erase, Undo, Redo, Explode, Move, Copy, Rotate, Mirror, Array, Align, Scale, Stretch, Lengthen, Trim, Extend, Break, Join, Chamfer, Fillet. Display Control Zoom, Pan, Redraw, Clean Screen.
Week 7	Mid exam
Week 8	Dimension - Linear, Aligned, Radius, Diameter, Center Mark, Angle, Arc length, Continuous, Baseline, Tolerance, Dimension Space, Dimension Break, Jogged radius, Ordinate dimensions
Week 9	Annotation Tools Text, Style, M text, Scale text, Spell
Week 10	Hatching Objects
Week 11,12	3D modeling

Week13	Convert 2D To 3D
Week 14	Solid Editing
Week 15	Exercises drawing
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to AutoCAD 2010 By Alf Yarwood Copyright 2009	Yes
Recommended Texts	An Introduction to Autodesk Inventor 2010 and AutoCAD 2010 Unbnd Edition by Randy Shih	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Engineering Workshops	Module Delivery ☐ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical
Module Type	Support or related learning activity	
Module Code	CET1105	
ECTS Credits	6	

SWL (hr/sem)	150	☐ Seminar	
Module Level	1	Semester of Delivery	1
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name	Dr. Mahmoud Shuker Mahmoud	e-mail	mahmoud.shukur@mtu.edu.iq
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	The objective of studying Electrical, Electronic, and Mechanical workshops is to enable students to acquire the necessary skills and knowledge to deal with electrical, electronic, and mechanical systems and devices. This subject aims to teach students how to diagnose faults, repair systems, and perform maintenance on these systems and devices. By studying Electrical, Electronic, and Mechanical workshops, students can understand the principles of electricity, electronics, and mechanics, as well as how to read engineering diagrams and use various tools and equipment to work on them. They also learn how to diagnose faults, repair them, and properly maintain different devices in a safe manner.
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	In general, studying this subject aims to prepare students to become skilled technicians in the field of electrical, electronic, and mechanical engineering. They can work in areas such as industrial maintenance and repair, electrical and electronic installations, automation and robotics, medical devices, and other modern technologies
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The learning outcomes of studying Electrical, Electronic, and Mechanical workshops include: 1. Acquisition of diagnostic and repair skills: Students learn how to analyze problems, identify faults in electrical, electronic, and mechanical systems, and implement appropriate repair procedures. 2. Understanding of electrical, electronic, and mechanical principles: Students gain knowledge of engineering and technical fundamentals related to electricity, electronics, and mechanics, including reading engineering diagrams and practical understanding of circuits, electronic devices, and mechanical components. 3. Development of practical work skills: Students have the opportunity to learn hands-on and practice using various tools and equipment used in electrical, electronic, and mechanical workshops. 4. Ability to perform preventive maintenance: Students learn how to maintain systems and devices and carry out preventive maintenance to ensure proper and sustainable performance. 5. Enhancement of teamwork and communication skills: Studying Electrical, Electronic, and Mechanical workshops promotes collaboration among students and the ability to work as a team in problem-solving and executing practical projects. 6. Knowledge and Understanding: a. Demonstrate a comprehensive understanding of the principles and concepts related to electrical and mechanical workshop operations. b. Identify and explain the safety measures and regulations applicable to electrical and mechanical workshops. 7. Describe the different tools, machines, and materials used in electrical and mechanical workshops. 8. Practical Skills: a. Apply safe working practices and use appropriate personal protective equipment (PPE) in electrical and mechanical workshop environments. b. Demonstrate proficiency in using various tools and equipment for turning, filing, drilling, welding, and assembly. 9. Perform practical tasks related to electrical and mechanical workshop operations accurately and efficiently. d. Apply problem-solving techniques to troubleshoot and rectify common issues encountered in electrical and mechanical workshop activities. 10. Critical Thinking and Analysis: a. Analyze and evaluate different turning processes, instrumentation measures, and cutting tools used in the workshop. b. Assess the quality of filing processes and choose appropriate rasps and tools for different filing tasks.

	11. Evaluate the drilling processes and select suitable drilling tools based on specific requirements. d. Analyze welding processes, including oxy-acetylene and arc welding, and determine safety precautions and best practices. 12. Communication and Collaboration: a. Effectively communicate and collaborate with peers in group projects and workshop activities. b. Present findings, results, and recommendations related to electrical and mechanical workshop tasks in a clear and concise manner. 13. Professional and Ethical Responsibility: a. Demonstrate ethical behavior and responsibility in adhering to safety regulations, environmental considerations, and industry standards in electrical and mechanical workshop practices 14. Overall, studying this subject prepares students to enter the job market in various technical and engineering fields, such as industrial maintenance, electrical and electronic installations, automation and robotics, medical devices, and other modern technologies.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Electronic workshop</u> In this part, we will learn how to check the elements in the electrical circuits, what is the way each element works, how to check it, and find out what is damaged and replace it. [14 hrs.] We will also talk about conductors and semiconductors [10 hrs.] <u>Part B – Electrical workshop</u> 1. Principles of Industrial Safety in Electrical Workshops [4 hrs.] 2. Tools Used in Electrical Workshops [5 hrs.]. 3. Power Sources and Characteristics [5 hrs.] 4. Multimeter and Wire Size Measurement [5 hrs.] <u>Part C – Mechanical workshop</u> 1. Different Types of Welding Irons and Spot Welding [4 hrs.] 2. Electric Transformers [5 hrs.] 3. Electric Circuits and Transformer Operation [5 hrs.]. 4. Types of Electric Motors [5 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 labs, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على 15 اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.73
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 11	LO #1-4, LO #8-11
	Assignments	1	5% (10)	12	LO # 1-14
	Projects / Lab.	2	20% (10)	Continuous	ALL
	Report	1	5% (10)	13	ALL
Summative assessment	Midterm Exam	4 hr	10% (10)	8	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي للمختبر

Electronic, Electrical , Mechanical Workshops

	Material Covered
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Week 1,2	❖ Use different measuring devices in the workshop ❖ 1- Principles of Industrial Safety in Electrical Workshops. 2- Different Types of Welding Irons (with different capacities) and Spot Welding
Week 3,4	❖ How to use irons, types of soldering used, and how to use absorbent soldering irons ❖ 1- Electric Circuits and Transformer Operation. 2- Electrical Installations and Types of Wiring (Surface and Concealed)
Week 5,6,7	❖ Electronic components (resistor , inductors , capacitors) ❖ 1- ONE LAMP CONTROLLED BY ONE SWITCH 2- Parallel Wiring of Two Lamps with a Switch and Socket
Week 8	❖ Midterm Exam
Week 9 ,10	Electronic components (resistor , inductors , capacitors) Drawing a Staircase Lamp (Two-Way Switch) Circuit
Week 11,12	❖ Electronic components (Battery , jumper, fuse, push button, switch, rotary switch) ❖ 1- Introduction to Workshop Safety 2- Turning Process and Instrumentation Measures
Week 13,14	❖ Electronic components (Diode , Transistor, Transformer) ❖ 1- Cutting Tools 2- Practical Exercise - Horizontal Turning
Week 15	❖ using bread board and Vero board, Building a Circuit on Breadboard, Building a Circuit on Vero board ❖ 1- Turning Different Shapes 2- Introduction to Filing Process (practical Exercise)
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Encyclopedia of Electronic Components Volume 1 (Charles Platt). 2- J. Smith and E. Johnson, "Electrical Engineering Workshop:Theory and Practice	Yes / online
Recommended Texts		No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	English Language I		Module Delivery	
Module Type	Basic learning activities		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MTU1002			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	1	Semester of Delivery	1	
Administering Department	CET	College	EETC	
Module Leader		e-mail		
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	29/10/2023	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 أهداف المادة الدراسية	1. know students with essential information in the English language in association with reading, writing and speaking skills, and knowing more English vocabulary. 2. To understand pronouns, questions and short answers, tenses (present, past and future), adjective, adverb, prepositions of place, punctuation marks and practicing writing. 3. This module works towards enhancing students' English language competencies along with their technical or professional knowledge. 4. Enhance students' communication skills in English can result in better job opportunities in the future
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student will have the ability to: 1. Know the English skills of reading, and writing. 2. Recognize other English language skills such as: grammar, vocabulary. 3. Understand and appreciate the importance of grammar aspects and vocabulary to increase the ability of communicating ideas about the English language. 4. Understand pronouns, questions and short answers. 5. Understand tenses present, past and future. 6. Understand adjectives, adverbs, prepositions of place, and punctuation marks. 7. Practicing reading and writing. 8. Enhance students' communication skills in English.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A: Parts of Sentence.</u> Pronoun, question and short answer, adjective, adverb, prepositions of place. [14 hrs] <u>Part B: Tenses</u> Past Tense, Present Tense, and Future Tense. [8 hrs] <u>Part C: Reading and Writing</u> Punctuation marks, and practicing writing [8 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategies that will be adopted in delivering this module are: - Allow students to actively participate in the learning process with class discussions and exercises that support the initiative. - Use didactic questioning through questions to determine student understanding of the material. - Writing an assignment and report that encourages students to clarify and organize their thinking and independently research and present on a topic.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	5, 10	LO # 1-3 , 4- 7
	Assignments	2	10% (10)	Cont.	LO # 1- 7
	Projects / Lab.				
	Report	1	10% (10)	14	1-8
	Midterm Exam	2 hours	10% (10)	8	LO # 1-5

Summative assessment	Final Exam	3 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Unit 1: Grammar: Types of Pronouns Vocabulary: Everyday objects, Plurals Reading and Writing Skill
Week 2	Unit 2: Grammar: Pronoun, Questions Vocabulary: Countries, Adjective and Nouns Reading and Writing Skill
Week 3	Unit 3: Grammar: Negatives, Questions and short answer Vocabulary: Jobs, Personal Information Reading and Writing Skill
Week 4	Unit 4: Grammar: Possessive adjectives, Possessive 's, common verbs (1): has/have, love, like, work. Vocabulary: The family, The alphabet Reading and Writing Skill
Week 5	Unit 5: Present Simple, Questions Vocabulary: Sport, Food and Drink, Verb phrase, Languages and nationalities, Adjective + noun. Reading and Writing Skill
Week 6	Unit 6: Grammar: Adverbs of frequency (sometimes, always, never), Questions and Negatives.

	Vocabulary: The Time, Word that go together Reading and Writing Skill
Week 7	Unit 7: Grammar: Question words, Pronouns (subject, object, possessive), that and this. Vocabulary: Adjectives Reading and Writing Skill Grammar: There is/There are, Prepositions of place Vocabulary: Rooms and furniture, Place of town Reading and Writing Skill
Week 8	Mid exam
Week 9	Unit 9: Grammar: Past Simple Tense - regular verbs Vocabulary: years, have, do, go Reading and Writing Skill
Week 10	Unit 10: Grammar: Past Simple Tense - irregular verbs, Questions and Negatives, Time expression, ago. Vocabulary: Weekend activities, Sport and leisure Reading and Writing Skill
Week 11	Unit 11: Grammar: can/can't, Adverbs, Request and offers. Vocabulary: Verb + noun, Adjective + noun, Opposite adjective Reading and Writing Skill
Week 12	Unit 12: Grammar: Would like, some and any, like and would like Vocabulary: Places and town, In cafe Reading and Writing Skill
Week 13	Unit 13: Grammar: Present Continuous Tense Vocabulary: Colors, Clothes, Opposite verbs Reading and Writing Skill
Week 14	Unit 14: Grammar: Future Tense, going to Vocabulary: Forms of transport

	Reading and Writing Skill
Week 15	Grammar: Punctuation Marks, Grammar revision Vocabulary: Vocabulary revision Reading and Writing Skill
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	New Headway Plus/ Beginner, John and Liz Soars, Oxford University Press	No
Recommended Texts	Understanding and Using English Grammar, 5 th Edition, Betty S. Azar Stacy A. Hagen.	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 works 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Digital Systems		Module Delivery
Module Type	Core		☒ Theory Lecture ☒ Lab Tutorial Practical Seminar
Module Code	CET1201		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	2
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	

Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CET1101	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	20. To understand the flip flop operation. 21. To understand the latches operation. 22. This course deals with the designing of logic systems. 23. To understand the principles of counter circuits. 24. To understand the shift registers. 25. To have a skill to design ADC and DAC.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	37. Discuss the flip-flops. 38. Recognize the differences between flip-flops and latches. 39. List the applications of flip-flops. 40. Summarize what is meant by the logic systems. 41. Explain the counter circuits and discuss the difference between synchronous and asynchronous counter. 42. Discuss the types of asynchronous counter circuits. 43. Discuss the types of synchronous circuit. 44. Identify the shift registers.

	45. Discuss the operations of each types of shift registers. 46. Discuss the shift register counter. 47. Explain the principles of ADC and DAC. 48. Explain the design for each type of ADC and DAC.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. --Flip-Flops – SR latch, T latch, D latch. [10 hrs] --Flip-Flops- JK FF, edge triggered, and conversion from one type to another. [10 hrs] --Counters- Asynchronous, synchronous counters, Decade, up-down counters, and counter decoding. [15 hrs] --Shift-registers - serial in/serial out, serial in/parallel out, parallel in/serial out, parallel in/parallel out, bidirectional , shift register counter (Johnson counter, Ring counter)) [10 hrs] --Multivibrators- definition, astable, bistable, mono-stable, and 555 timer [5 hrs] --A/D convertors modeling -flash ADC, tacking ADC, slope ADC ,successive approximation ADC, digital ramp ADC, delta sigma ADC. [5 hrs] --D/A convertors modeling -R/2R DAC, R/2nR DAC. [5 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب موزعة على 15 اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.73
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Flip-flops and latches(SR latch, D latch)
Week 2	Flip-Flops(T-latch, JK)
Week 3	Flip-Flops(edge triggered, master-slave)
Week 4	Flip-flops (conversion from one type to another, flip flop applications)
Week 5	Asynchronous counter
Week 6	Synchronous counter
Week 7	Decade, up-down counter
Week 8	Cascade counter, Counter decoding
Week 9	Shift-registers (serial in/serial out, serial in/parallel out, parallel

	in/serial out, parallel in/parallel out)
Week 10	Midterm exam
Week 11	Shift-registers (bidirectional , shift register counter), Johnson counter, Ring counter
Week 12	Multivibrators (definition, astable, bistable)
Week 13	Multivibrators (monostable, 555 timer)
Week 14	A/D convertors (flash ADC, tacking ADC, slope ADC ,successive approximation ADC, digital ramp ADC, delta sigma ADC)
Week 15	D/A convertors ($R/2R$ DAC, $R/2^n R$ DAC)
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	SR ff, T ff
Week 2	D ff, JK ff
Week 3	Master-slave ff
Week 4	asynchronous counter (2-bit,3-bit)
Week 5	asynchronous counter(4-bit, modulus counter)
Week 6	synchronous counter (2-bit, 3-bit)
Week 7	synchronous counter (decade, up-down counter)
Week 8	Cascade counter, counter decoding
Week 9	Serial in-serial out, parallel in-parallel out shift register
Week 10	Serial in-parallel out, parallel in- serial out SR
Week 11	Johnson counter, ring counter
Week 12	multivibrator
Week 13	Analogue to digital convertor
Week 14	Digital to analogue convertor

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Digital Fundamentals by Floyed	Yes
Recommended Texts	Digital circuit analysis and design with Simulink modeling by Steven T. Karris	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Electrical Circuits		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET1202			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	1	Semester of Delivery		
Administering Department	CET	College	EETC	
Module Leader			e-mail	
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Electrical Engineering Fundamentals	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	26. To develop problem solving skills and understanding of circuit theory through the application of techniques Alternating Waveforms (A.C). 27. To understand voltage, current and power from a (A.C) circuit. 28. Deals with the basic concept of electrical (A C) circuits. 29. This is the basic subject for all electrical and electronic circuits. 30. To understand Kirchhoff's current and voltage Laws problems. 31. To perform Thevenin's Norton's Theorem.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	49. Recognize how electricity works in electrical circuits. 50. List the various terms associated with electrical circuits. 51. Summarize what is meant by a basic electric circuit. 52. Discuss the reaction and involvement of atoms in electric circuits. 53. Describe electrical power, charge, and current. 54. Define Ohm's law. 55. Identify the basic circuit elements and their applications. 56. Discuss the operations of AC circuits in an electric circuit. 57. Discuss the various properties of resistors. 58. Explain the two Kirchhoff's laws used in circuit analysis. 59. Identify the basic circuit elements, Maximum Power Transfer Theorem and Superposition's method 60. Describe Thevenin's theorem and Norton's theorem and how they work IN AC Circuits.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Definition:</u> - The Alternating Current Network Types of Alternating Waveforms, Generation of Alternating Current, and Definitions related to Alternating Waveforms The Alternating Current Network. Ohms law, The Mean Values, The Effective Values, The Vector Diagram (40 hr) <u>Circuit Theory in (A.C)</u> Ac circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Series Ac Circuits (R L C), Reviews for Complex Numbers and their mathematical operations (24 hr) <u>Fundamentals</u>

	Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, Conversion Delta To Star Connection, Superposition Method, Maximum Power Transfer Theorem, Superposition's method (24 hr)
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This Course Specification prepares the student to be able to realize basic parameters in electrical engineering and how to link these parameters. It also makes him capable of solving electrical circuits using different theorems in addition to utilizing the dc theorems to solve ac circuits. Moreover, it goes into configuring 3 phase circuits, vectors, phase and total powers and to have the student being capable of linking electricity to magnetism
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.733
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The Alternating Current Network Types of Alternating Waveforms, Generation of Alternating Current, and Definitions related to Alternating Waveforms
Week 2	The Mean Values of Current and Voltage
Week 3	The Effective Vales of Current and Voltage
Week 4	Circuit Elements in the Phasor Domain
Week 5	The Vector Diagram
Week 6	Reviews for Complex Numbers and there mathematical operations
Week 7	Series Ac Circuits (R L C) ,Parallel Ac Circuits(R L C)
Week 8	Mid exam
Week 9	The Instantaneous Power and Mean Power of AC, Reactive and Apparent Power
Week 10	Using Kirchhoff's law's to solve AC circuits
Week 11	Using Superposition's method to solve AC circuits
Week 12	Using Thevenin's theorem, to solve AC circuits
Week 13	Using Norton's theorem to solve AC circuits
Week 14	3- Phase Current, 3- Phase System, Y- Connection Delta Connection.
Week 15	Transformers , The hysteresis losses , The eddy current losses

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: How to use measuring devices for alternating circuits (A.C) Osliscope, voltmeter and ammeter
Week 2	Lab 2: how to measure Alternating Waveforms
Week 3	Lab 3: Apply Ohm's Law
Week 4	Lab 4: Series Ac Circuits (R C)
Week 5	Lab 5: Series Ac Circuits (R L)
Week 6	Lab 6: Series Ac Circuits (R L C)

Week 7	Lab 7: Apply Kirchhoff's law to measure voltages	
Week 8	Lab 8: Apply Kirchhoff's law to measure current	
Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Programming Essentials		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET1203		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	2
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of programming principles. 2. To understand the logic behind programming. 3. This course include using C++ as a programming language. 4. This course include algorithm design. 5. To understand how a programmer should prepare his work and think logically. 6. To perform programming project using control statements, functions, and to deal with the data stored in an array or file.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Use of algorithms (Flowchart specifically). 2. Explain how the program is written using C++ Programming language. 3. Define and use of variables (Data types, Declaration of variables). 4. Use of operators and its precedence (Assignment, Arithmetic operators, Relational and Logical operators, Bitwise Operators, Increment and decrement, Cast operator, and Conditional operator). 5. Making Decisions (use of: if, if-else, and switch statements) and draw of Flowchart of if-else statement. 6. Use of Loops (for, while, do-while), and use of break and continue statements with loops, and draw of Flowchart of loops. 7. Use of Arrays (one and two dimensional). 8. Use of Functions (Built-in function functions (Library functions), and User-Defined functions). 9. Use of arguments passed by value and by reference, and use of Local and global variables. 10. Use of Character sequences and string handling. 11. Handling and processing text files in C++.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - -Introduction to computers and programming. Types of programs (Applications and Systems). Programming languages (Machine, Assembly, and High-level language). Introduction to Compilers, Interpreters, object file, and executable file. Introduction to C++ with a simple program implementation. Types of

	programming errors, Program development life cycle, Algorithms - Flowchart - . Header files, Standard Input/output instructions, Comments in C++. [15 hrs] -- Variables, Data Types, Declaration of variables, Constants, Statements. Operators (Assignment, Arithmetic operators, Relational and Logical operators, Bitwise Operators, Increment and decrement, Cast operator, and Conditional operator), Precedence of operators. [5 hrs] -- Making Decisions (if, if-else statements), Flowchart of if-else statement. Making Decisions (switch statement), using break statement with switch statement, Flowchart of switch statement. Loops (for, while, do-while), using break and continue statements with loops, Flowchart of loops. [10 hrs] - -Arrays (One dimensional and Two Dimensional) [5 hrs] -- Functions (Built-in function functions (Library functions), and User-Defined functions), Function prototype (Declaration), Function call, Passing arguments to a function, return statement, Value-Returning vs. Void (Non Value Returning) functions, Function with no argument and no return value, Function with no argument but return value, Function with argument but no return value, Function with argument and return value. Arguments passed by value and by reference, Recursion, Local and global variables. [15 hrs] -- Character sequences and string handling, ASCII table. [5 hrs] - -Handling and processing text files in C++ [5 hrs]
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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 learning and developing their skills in programming and logic thinking, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by
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	considering type of lab experiments involving assignments and project design activities that are interesting to the students.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.73
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Introduction (History of computers). Types of programs (Applications and Systems).

	Programming languages (Machine, Assembly, and High-level language).
Week 2	Introduction to Compilers, Interpreters, object file, and executable file. Types of programming errors, program development life cycle.
Week 3	Algorithms (Flowchart).
Week 4	Variables, Data Types, Declaration of variables, Constants, Statements, and Operators.
Week 5	Making Decisions (if, if-else statements), flowchart of if-else statement.
Week 6	Making Decisions (switch statement), using break statement with switch statement, flowchart of switch statement.
Week 7	Mid-term Exam
Week 8	Loops (while, do-while), using break and continue statements with loops, flowchart of loops.
Week 9	Arrays (One dimensional)
Week 10	Arrays (Two Dimensional)
Week 11	Functions: Built-in function functions (Library functions), and User-Defined functions), Function prototype (Declaration), function call, Passing arguments to a function, return statement, Local and global variables.
Week 12	Functions (Value-Returning) vs. Void (Non Value Returning) functions, function with no argument and no return value, function with no argument but return value, function with argument but no return value, function with argument and return value. Arguments passed by value and by reference.
Week 13	Character sequences and string handling, ASCII table.
Week 14	Handling and processing text files in C++
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to C++ with a simple program implementation. Header files, Standard Input/output instructions, Comments in C++.
Week 2	Lab 2: Variables and Operators (Assignment, Arithmetic operators, Relational and Logical operators, Bitwise Operators, Increment and decrement, Cast operator, and Conditional

	operator), Precedence of operators.
Week 3	Lab 3: Making Decisions (if, if-else).
Week 4	Lab 4: Making Decisions (switch statements).
Week 5	Lab 5: Loops (for)
Week 6	Lab 6: Loops (while, and do-while)
Week 7	Lab 7: Arrays (1D)
Week 8	Lab 8: Arrays (2D)
Week 9	Lab 9: Functions
Week 10	Lab 10: Function types according to whether it take arguments and/or return a value or not.
Week 11	Lab 11: Character sequences and string handling.
Week 12	Lab 12: Text files

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	C++ How to Program, 6th Edition 2007 By P. J. Deitel - Deitel & Associates, Inc., H. M. Deitel - Deitel & Associates, Inc.	Yes
Recommended Texts	Starting Out with Programming Logic and Design (What's New in Computer Science), 5th Edition 2018 By Tony Gaddis	No
Websites	https://www.geeksforgeeks.org/c-plus-plus	

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 -	متوسط	60 - 69	Fair but with major shortcomings

	Satisfactory			
	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Mathematics II		Module Delivery	
Module Type	Suport or related learning activity		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET1204			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	1	Semester of Delivery		
Administering Department	CET	College	EETC	
Module Leader			e-mail	
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	

Scientific Committee Approval Date	29/10/2023	Version Number	1.0
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Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CET 1103	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	7. To Understand concepts of vectors and vector operations. 8. To Understand concepts of linear algebra. 9. To get a grasp of various methods to solve systems of linear equations. 10. To Compute linear transformations. 11. To be able to determine Eigenvalues and Eigenvectors. 12. To perform matrix diagonalization.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	16. Recognize Vectors concepts, notation and Operations. 17. Discuss dot product, cross product, Orthogonal and orthonormal vectors. 18. Discuss the terms Diagonal, Triangular, Symmetric, Square Matrix, Transpose of a Matrix. 19. Describe the matrix operations {addition, subtraction, scalar multiplication, multiplication}. 20. Identify Determinant and Inverse for Nonsingular matrices.

	21. Discuss aspects about System of Linear Equations (Linear Equations, Linear Equations Solution, Matrix equations.). 22. Identify Row operations, row-echelon form “triangular”, Rank of a Matrix, reduced row-echelon form, Augmented Matrix. 23. Discuss Gaussian elimination. 24. Explain Gauss–Jordan elimination and Solving Systems with Inverses. 25. Explain Cramer's Rule. 26. Explain Linear Combinations of Vector, span. 27. Explain Linear Dependence and Independence, Basis and Dimension, Rank of a Matrix. 28. Recognize Linear Transformations. 29. Discuss Polynomials of Matrices, Characteristic Polynomial, Cayley–Hamilton Theorem. 30. Discuss Eigenvalues and Eigenvectors, Diagonalizing Matrices.
Indicative Contents المحتويات الإرشادية	<u>Part A - Vectors.</u> This part includes Vectors definition, notation {Ordered set, Matrix, Unit vector}, Magnitude, Unit, Zero, negative, Direction, Operations on vectors {addition, subtraction, scalar multiplication}. In addition to Operations on vectors {dot product, cross product}, Orthogonal, orthonormal vectors. [6 hrs] + Revision problem classes in weekly tutorials [2 hrs] <u>Part B – Matrices.</u> This part will take in details Matrices (Matrix, Diagonal, Triangular, Symmetric, Square Matrix, Transpose of a Matrix.), in addition to operations {addition, subtraction, scalar multiplication, multiplication}. Furthermore, Determinant, Inverse (Nonsingular). [10 hrs] + Revision problem classes in weekly tutorials [3 hrs] <u>Part C – System of Linear Equations.</u> This part discusses System of Linear Equations (Linear Equations, Linear Equations Solution, Matrix equations.), in addition to Row operations, row-echelon form “triangular”, Rank of a Matrix, reduced row-echelon form, Augmented Matrix. Furthermore, Gaussian elimination, Gauss–Jordan elimination, Solving Systems with Inverses, Cramer's Rule is described. [14 hrs] + Revision problem classes in weekly tutorials [4 hrs]

Part D – Vector Spaces and Diagonalization.

This part discusses Vector Spaces (Linear Combinations of Vector, span, Linear Dependence and Independence, Basis and Dimension, Rank of a Matrix, Linear Transformations. Furthermore, Diagonalization (Polynomials of Matrices, Characteristic Polynomial, Cayley–Hamilton Theorem, Eigenvalues and Eigenvectors, Diagonalizing Matrices.) [15 hrs] + Revision problem classes in weekly tutorials [5 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

This module will primarily focus on encouraging students to participate in the activities, as well as refining and developing their critical thinking skills. This will be achieved through lectures, tutorials, discussions, and grading activities.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20%	5,10	LO #1 - 4, LO # 6-9
	Assignments	2	15%	5,10	LO # 1 - 14, LO # 6-9

	Projects / Lab.	N/A			
	Report	5	5%	Cont.	LO # 1-15
Summative assessment	Midterm Exam	2 hr	10% (10)	5	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	Vectors (Definition, notation {Ordered set, Matrix, Unit vector}, Magnitude, Unit, Zero, negative, Direction, Operations on vectors {addition, subtraction, scalar multiplication}.)
Week 2	Vectors (Operations on vectors {dot product, cross product}, Orthogonal, orthonormal vectors.)
Week 3	Matrices (Matrix, Diagonal, Triangular, Symmetric, Square Matrix, Transpose of a Matrix.)
Week 4	Matrices (operations {addition, subtraction, scalar multiplication, multiplication}). Matrices (Determinant, Inverse (Nonsingular))
Week 5	Midterm Exam
Week 6	System of Linear Equations (Linear Equations, Linear Equations Solution, Matrix equations.)
Week 7	System of Linear Equations (Row operations, row-echelon form “triangular”, Rank of a Matrix, reduced row-echelon form, Augmented Matrix.)

Week 8	System of Linear Equations (Gaussian elimination.), System of Linear Equations (Gauss–Jordan elimination, Solving Systems with Inverses.)
Week 9	System of Linear Equations (Cramer's Rule.)
Week 10	Midterm Exam
Week 11	Vector Spaces (Linear Combinations of Vector, span.). Vector Spaces (Linear Transformations.)
Week 12	Midterm Exam
Week 13	Vector Spaces (Linear Dependence and Independence, Basis and Dimension, Rank of a Matrix.)
Week 14	Diagonalization (Polynomials of Matrices, Characteristic Polynomial, Cayley–Hamilton Theorem.)
Week 15	Diagonalization (Eigenvalues and Eigenvectors, Diagonalizing Matrices.)
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Tutorial)

المنهاج الاسبوعي الاضافي

	Material Covered
Each week, a question sheet related to the material presented in the theoretical lecture will be solved and debated.	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	David C. Lay, Judi J. McDonald, Steven R. Lay, "Linear Algebra and Its Applications", Pearson Education, 6th edition (July 10th 2020), ISBN-13: 978- 0136880929.	Yes
Recommended Texts	Gilbert Strang, " Linear Algebra and Its Applications", Cengage Learning, 4th edition, (January 1, 2006), ISBN-13: 978-0030105678.	No
Websites	https://www.udemy.com/course/linear-algebra-with-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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Arabic Language		Module Delivery
Module Type	Basic learning activities		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MTU1001		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	2
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	أهداف المادة الدراسية هي اني يكون الطالب قادراً على أن : 1. يتعرف على أنواع الأخطاء اللغوية المشتركة وتوضيح أسبابها وكيفية تجنبها. 2. يتعلم القواعد المتعلقة بالتاء المربوطة والطويلة والتاء المفتوحة وكيفية كتابتها بشكل صحيح. 3. يتعلم قواعد كتابة الألف الممدودة والمقصورة واستخدام الحروف الشمسية والقمرية بشكل صحيح. 4. التعرف على الضاد والطاء ومعرفة كيفية التمييز بينهما في الكتابة. 5. يتعلم طرق كتابة الهمزة بشكل صحيح وفقاً للقواعد اللغوية. 6. التعرف على علامات الترقيم واستخدامها بشكل صحيح في النصوص. 7. يفهم الفروق بين الاسم والفعل والتمييز بينهما في الجمل. 8. يفهم المفاعيل وكيفية استخدامها بشكل صحيح في النصوص. 9. يتعلم الأرقام والعدد واستخدامها في التعبير عن الكميات. 10. يتجنب الأخطاء اللغوية الشائعة في سياقات عملية لتعزيز فهم القواعد وتحسين المهارات اللغوية. 11. يدرس النون والتنوين وفهم معاني حروف الجر واستخدامها بشكل صحيح في الجمل. 12. يركز على الجوانب الشكلية للخطاب الإداري وكيفية كتابته بأسلوب صحيح ومناسب. 13. التعرف على لغة الخطاب الإداري وفهم استخدامها في التواصل الإداري. 14. يفهم نماذج من المراسلات الإدارية لتطبيق المفاهيم والمهارات المكتسبة في الخطاب الإداري.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	مخرجات التعلم للمادة الدراسية هي: 1. قدرة الطلاب على تحليل وتعريف الأخطاء اللغوية المشتركة وتطبيق القواعد الصحيحة لتجنبها. 2. القدرة على استخدام القواعد اللغوية المتعلقة بالتاء المربوطة والطويلة والتاء المفتوحة بشكل صحيح. 3. قدرة الطلاب على استخدام الألف الممدودة والمقصورة بشكل صحيح واستخدام الحروف الشمسية والقمرية بطريقة صحيحة. 4. تمكين الطلاب من التمييز بين الضاد والطاء وتطبيق القواعد الصحيحة في الكتابة. 5. القدرة على كتابة الهمزة بشكل صحيح وفقاً للقواعد اللغوية. 6. استخدام علامات الترقيم بشكل صحيح في النصوص المكتوبة. 7. فهم الطلاب للفروق بين الاسم والفعل وتمكينهم من استخدامها بشكل صحيح في الجمل. 8. القدرة على استخدام المفاعيل بشكل صحيح في النصوص المكتوبة. 9. استخدام الأرقام والعدد بطريقة صحيحة للتعبير عن الكميات. 10. التمكن من تطبيق الأخطاء اللغوية الشائعة في سياقات عملية وتصحيحها بشكل مناسب. 11. فهم استخدام النون والتنوين ومعاني حروف الجر واستخدامها بشكل صحيح في الجمل. 12. القدرة على كتابة الخطاب الإداري بأسلوب صحيح ومناسب وفهم لغة الخطاب الإداري. 13. تطبيق المفاهيم والمهارات المكتسبة في كتابة المراسلات الإدارية بشكل صحيح وفعال.
Indicative Contents المحتويات الإرشادية	المحتويات الإرشادية في مادة اللغة تشمل مجموعة من المفاهيم والمواضيع التي يتم تغطيتها خلال عملية التعلم. ومن بين المحتويات الإرشادية المهمة: 1. مقدمة عن الأخطاء اللغوية والتعريف بالتاء المربوطة والتاء المطولة والتاء المفتوحة. (4 ساعات)

2. قواعد كتابة الألف الممدودة والمقصورة والتعرف على الحروف الشمسية والقمرية. (4 ساعات)
 3. دراسة الضاد والطاء وتعلم طرق كتابتهما بشكل صحيح. (4 ساعات)
 4. تعلم كتابة الهمزة بشكل صحيح وفقاً للقواعد اللغوية. (4 ساعات)
 5. دراسة علامات الترقيم وتعلم استخدامها بشكل صحيح في النصوص اللغوية. (4 ساعات)
 6. التعرف على الاسم والفعل والتفريق بينهما وفهم القواعد المتعلقة بهما. (4 ساعات)
 7. دراسة المفاعيل وتعلم استخدامها في الجمل اللغوية. (4 ساعات)
 8. التعرف على الأعداد واستخدامها بشكل صحيح في العبارات والجمل. (4 ساعات)
 9. دراسة الأخطاء اللغوية الشائعة وتطبيقاتها في النصوص اللغوية. (4 ساعات)
 10. تعلم استخدام النون والتنوين وفهم معاني حروف الجر واستخدامها بشكل صحيح في الجمل. (3 ساعات)
 11. التعرف على الجوانب الشكلية للخطاب الإداري وفهم لغته وقواعده. (3 ساعات)
 12. دراسة نماذج من المراسلات الإدارية وتطبيقها في الكتابة. (3 ساعات)
- توفر هذه المحتويات الإرشادية للطلاب فهماً شاملاً للمفاهيم اللغوية وتعلم القواعد والتطبيقات العملية التي تساعد في تطوير مهاراتهم اللغوية.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- استراتيجيات التعلم والتعليم المستخدمة في مادة اللغة تشمل مجموعة متنوعة من النهج والتقنيات التي تعزز عملية التعلم للطلاب. من بين هذه الاستراتيجيات:
1. التفاعل النشط: يتم تشجيع الطلاب على المشاركة والمشاركة الفعالة في الدروس من خلال المناقشات الجماعية والأنشطة التفاعلية.
 2. التعلم التعاوني: يشجع التعاون والتعاون بين الطلاب من خلال العمل الجماعي والمشاريع الجماعية، حيث يتعاون الطلاب مع بعضهم البعض لتحقيق أهداف التعلم المحددة.
 3. التطبيق العملي: يتم توفير فرص للطلاب لتطبيق المفاهيم والمهارات المكتسبة في سياقات عملية وواقعية، مما يعزز التفاعل الفعال مع المادة.
 4. استخدام التقنيات الحديثة: يستفيد الطلاب من استخدام التكنولوجيا في عملية التعلم، مثل استخدام الحواسيب والإنترنت للبحث والتعلم الذاتي.
 5. توفير ردود فعل فورية: يتم توفير ردود فعل فورية وتقييم مستمر للطلاب، سواء عن طريق التقييمات الشفهية أو الكتابية، مما يساعدهم على تحسين أدائهم وتطوير مهاراتهم.
 6. التنوع في وسائل التواصل: يتم استخدام مجموعة متنوعة من وسائل التواصل والتعليم، مثل المحاضرات التوضيحية، والمناقشات الجماعية، والأنشطة العملية، والعروض التقديمية، لتلبية احتياجات وأساليب التعلم المختلفة للطلاب.
 7. باستخدام هذه الاستراتيجيات، يتم تعزيز التفاعل والتعلم الفعال للطلاب، و تحفيزهم على المشاركة واكتساب المعرفة والمهارات بشكل شامل وشيق.
 - 8.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

8-1	مقدمة عن الأخطاء اللغوية – التاء المربوطة والطويلة والتاء المفتوحة	الأسبوع الأول
14-9	قواعد كتابة الالف الممدودة والمقصورة – الحروف الشمسية والقمرية	الأسبوع الثاني
19-15	الضاد والظاء	الأسبوع الثالث
30-20	كتابة الهمزة	الأسبوع الرابع
36-31	علامات الترقيم	الأسبوع الخامس
50-37	الاسم والفعل والتفريق بينهما - المفاعيل	الأسبوع السادس
	الامتحان النصفى	الأسبوع السابع

61-51	العدد	الأسبوع الثامن
69-62	تطبيقات الأخطاء اللغوية الشائعة	الأسبوع التاسع والعاشر
75-70	النون والتنوين - معاني حروف الجر	الأسبوع الحادي عشر
80-76	الجوانب الشكلية للخطاب الإداري	الأسبوع الثاني عشر
86-81	لغة الخطاب الإداري	الأسبوع الثالث عشر والرابع عشر
	نماذج من المراسلات الإدارية	الأسبوع الخامس عشر
	الاستعداد للأمتحان النهائي	الأسبوع السادس عشر

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• ملزمة اللغة العربية (المعممة من وزارة التعليم العالي والبحث العلمي)	Yes
Recommended Texts		No
Websites	The Collage E-Library	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Democracy and Human Rights		Module Delivery	
Module Type	Basic learning activities		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MTU1006			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	1	Semester of Delivery	2	
Administering Department	CET	College	EETC	
Module Leader		e-mail		
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	1. التطور التاريخي لحقوق الإنسان: دراسة التطور التاريخي لفهم حقوق الإنسان من الحضارات القديمة إلى العصور الحديثة. 2. حقوق الإنسان في الشرائع السماوية: التركيز على حقوق الإنسان في الإسلام وكيف تم تضمينها في الشريعة الإسلامية. 3. اعتراف إقليمي بحقوق الإنسان: فحص اعتراف الأقاليم الأوروبي، الأمريكي، الإفريقي، الإسلامي، والعربي بحقوق الإنسان. 4. دور المنظمات غير الحكومية: دراسة دور المنظمات مثل اللجنة الدولية للصليب الأحمر ومنظمة العفو الدولية في حماية حقوق الإنسان. 5. الإطار القانوني الدولي والإقليمي: التركيز على المواثيق الدولية والإقليمية، مثل الإعلان العالمي لحقوق الإنسان. 6. تحليل حقوق الإنسان في التشريعات الوطنية: دراسة كيفية ترجمة حقوق الإنسان في التشريعات الوطنية، مع التركيز على الدستور العراقي. 7. تصنيف حقوق الإنسان وضماناتها: فهم مختلف أشكال حقوق الإنسان والضمانات الدستورية والقضائية والسياسية لحمايتها.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. القدرة على وصف وتحليل التطور التاريخي لحقوق الإنسان منذ الحضارات القديمة حتى العصور الحديثة. 2. القدرة على فحص حقوق الإنسان في حضارة وادي الرافدين وغيرها لفهم التأثير الثقافي على تطورها. 3. تفسير حقوق الإنسان في الإسلام وفهم كيف تم تضمينها في الشريعة الإسلامية. 4. القدرة على تحليل تطور حقوق الإنسان خلال العصور الوسطى والحديثة. 5. الفهم الشامل لاعتراف الأقاليم الأوروبي، الأمريكي، الإفريقي، الإسلامي، والعرب بحقوق الإنسان. 6. القدرة على تقييم دور منظمات مثل اللجنة الدولية للصليب الأحمر ومنظمة العفو الدولية في حماية حقوق الإنسان. 7. القدرة على دراسة وتحليل المواثيق الدولية والإقليمية، بما في ذلك الإعلان العالمي لحقوق الإنسان. 8. القدرة على فحص كيف تم ترجمة حقوق الإنسان في التشريعات الوطنية، مع التركيز على مثال الدستور العراقي. 9. القدرة على تصنيف حقوق الإنسان إلى أشكال فردية وجماعية، وأجيال مثل الحقوق المدنية والسياسية والاقتصادية والاجتماعية. 10. القدرة على تحليل الضمانات الدستورية والقضائية والسياسية لحقوق الإنسان على الصعيدين الوطني والدولي والإقليمي.
Indicative Contents المحتويات الإرشادية	فهم التاريخ التطوري لحقوق الإنسان (3 س) تحليل حقوق الإنسان في الحضارات القديمة (3 س) فهم حقوق الإنسان في الشرائع السماوية (3 س) تحليل حقوق الإنسان في العصور الوسطى والحديثة (3 س) فهم الاعتراف الإقليمي بحقوق الإنسان (3 س) تقدير دور المنظمات غير الحكومية (3 س)

فهم الإطار القانوني لحقوق الإنسان (3 س)
تحليل حقوق الإنسان في التشريعات الوطنية (3 س)
فهم أشكال وأجيال حقوق الإنسان (3 س)
تحليل ضمانات حقوق الإنسان (3 س)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	تشجيع الطلاب على المشاركة في مناقشات تفاعلية حول تطور حقوق الإنسان عبر التاريخ. مشروعات بحثية: توجيه الطلاب في إعداد مشروعات بحثية تستكشف تطور حقوق الإنسان في فترات تاريخية محددة. استخدام التكنولوجيا: تضمين وسائل تكنولوجيا لتعزيز تفاعل الطلاب وتقديم المعلومات بشكل أكثر تفاعلية. ورش العمل والتمثيل العملي: إجراء ورش عمل تفاعلية وأنشطة تمثيل لفهم أعمق لمفاهيم حقوق الإنسان. تقديم تقييم مستمر: تقديم تقييم مستمر لفحص تقدم الطلاب وفهمهم لتطور حقوق الإنسان على مر العصور.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

الأسبوع الأول	التطور التاريخي لحقوق الانسان حقوق الانسان في الحضارات القديمة (حضارة وادي الرافدين، والحضارات القديمة الأخرى)
الأسبوع الثاني	حقوق الانسان في الشرائع السماوية مع التركيز على حقوق الانسان في الاسلام. حقوق الانسان في العصور الوسطى والحديثة.
الاسبوع الثالث	الاعتراف الاقليمي بحقوق الانسان على الصعيد الأوربي الأمريكي، الأفريقي، الإسلامي، العربي
الأسبوع الرابع	المنظمات غير الحكومية ودورها في حقوق الانسان اللجنة الدولية للصليب الاحمر، منظمة العفو الدولية، منظمة مراقبة حقوق الانسان المنظمة العربية لحقوق الانسان
الأسبوع الخامس	حقوق الانسان في المواثيق الدولية والاقليمية والتشريعات الوطنية. حقوق الانسان في المواثيق الدولية (الاعلان العالمي لحقوق الانسان العهدين الدوليين الخاصين بحقوق الانسان
الأسبوع السادس	حقوق الانسان في المواثيق الاقليمية (الاتفاقية الأوروبية لحقوق الانسان الاتفاقية الامريكية لحقوق الانسان الميثاق الأفريقي لحقوق الانسان الميثاق العربي لحقوق الانسان
الأسبوع السابع	امتحان منتصف الفصل الدراسي
الأسبوع الثامن	حقوق الانسان في التشريعات الوطنية (الدستور العراقي)
الأسبوع التاسع	اشكال واجبال حقوق الانسان: اشكال حقوق الانسان الحقوق الفردية، الحقوق الجماعية اقبال حقوق الانسان الجيل الاول الحقوق المدنية والسياسية)، (الجيل الثاني الحقوق الاقتصادية والاجتماعية)، (الجيل الثالث: حقوق الانسان الحديثة ، الوعي الماني والبيئي
الأسبوع العاشر	ضمانات حقوق الانسان وحمايتها على الصعيد الوطني الضمانات الدستورية والقضائية والسياسية
الاسبوع الحادي عشر	ضمانات حقوق الإنسان وحمايتها على الصعيدين الاقليمي والدولي (دور الامم المتحدة، دور المنظمات الاقليمية جريمة الإبادة الجماعية.
الاسبوع الثاني عشر	تصنيف الحريات العامة الحريات الأساسية والفردية حرية الامن والشعور بالاطمئنان حرية الذهاب والاياب، الحرية الشخصية
الأسبوع الثالث عشر	الحريات الفكرية والثقافية حرية الرأي حرية المعتقد حرية التعليم
الأسبوع الرابع عشر	حرية الصحافة حرية التجمع حرية تشكيل الجمعيات
الأسبوع الخامس عشر	الحريات الاقتصادية والاجتماعية حرية العمل، حرية التملك حرية التجارة والصناعة

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• "حقوق الإنسان في العالم العربي: القضايا والتحديات"، تأليف: علي حجازي وجمال شعت. الطبعة: الطبعة الثانية، العام: 2017. • "مبادئ حقوق الإنسان: المفاهيم والقضايا الحديثة"، تأليف: أحمد المجالي وغان حمدان. الطبعة: الطبعة الأولى، العام: 2019.	Yes
Recommended Texts	1. "حقوق الإنسان والديمقراطية"، تأليف: مصطفى كامل محمود. الطبعة: الطبعة الأولى، العام: 2015. 2. "تاريخ حقوق الإنسان في العصور القديمة والوسطى"، تأليف: نبيل رزق. الطبعة: الطبعة الثالثة، العام: 2012. 3. "حقوق الإنسان في العراق: الواقع والتحديات"، تأليف: سعد الله عباس. الطبعة: الطبعة الأولى، العام: 2014. 4. "حقوق الإنسان في العراق: المفهوم والتطور"، تأليف: عبد الكريم السامرائي. الطبعة: الطبعة الأولى، العام: 2018. 5. "حقوق الإنسان في العراق: بين التحديات والآفاق"، تأليف: محمد السامرائي ولقاء الحربي. الطبعة: الطبعة الأولى، العام: 2020.	No
Websites	The Collage E-Library	

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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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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Mathematics		Module Delivery
Module Type	S		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	CET2101		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CET1204	Semester	Two
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	13. To develop problem solving skills and understanding of probability theory. 14. To distinguish aspects of probability terminology. 15. This course deals with the basic concept of Statistics. 16. To understand graphical representation of data measures. 17. To perform Simple Linear Regression.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	31. Recognize Basic terminology. 32. Describe Axioms for probability. 33. Discuss Conditional probabilities and independent events. 34. Explain random variable, Expectation and variance. 35. understand Bayes Theorem, PDF and CDF. 36. Define Expectation and variance of continuous random variables. 37. Identify Binomial, Poisson and Normal Distribution. 38. Discuss Joint and Marginal distributions aspects. 39. Discuss the Distributions of sums of independent random variables. 40. Explain Expectation and variance of sums of random variables, in addition to Covariance and correlation. 41. Describe Conditional expectation and Prediction. 42. Discuss Graphical Representation of frequency tables and charts, Measures of Central Tendency, and Dispersion.

	43. Get acquainted with Relationship Modelling, Pearson's Correlation Coefficient. 44. Explain Significance of the correlation co-efficient and Simple Linear Regression. 45. Describe Chi Square test for association, Chi Square test of goodness of fit.
Indicative Contents المحتويات الإرشادية	<u>Part A - Probability</u> This part includes Sample spaces and events. Axioms for probability and their consequences. Conditional probabilities. Bayes' formula. Independent events. Definition of random variable. Discrete random variables. Expectation and variance. Bayes Theorem, Discrete Probability Distributions, The cumulative distribution function. Probability density function. Expectation and variance of continuous random variables. Binomial Distribution, Poisson Distribution, The Normal Distribution, Joint distribution functions. Marginal distributions. Independent random variables. Distributions of sums of independent random variables. Expectation and variance of sums of random variables. Covariance and correlation. Conditional expectation. Prediction. [33 hrs] + Revision problem classes in weekly tutorials [11 hrs] <u>Part B - Statistics</u> This part will take in details Graphical Representation - frequency tables and charts, Measures of Central Tendency, and Dispersion. Relationship Modelling, Pearson's Correlation Coefficient Significance of the correlation co-efficient, Simple Linear Regression Chi Square test for association, Chi Square test of goodness of fit [12 hrs] + Revision problem classes in weekly tutorials [4 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This module will primarily focus on encouraging students to participate in the activities, as well as refining and developing their critical thinking skills. This will be achieved through lectures, tutorials, discussions, and grading activities.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1-4 , LO #5-9
	Assignments	2	20% (10)	4, 11	LO # 1-3 , LO # 4- 10
	Projects / Lab.	N/A			
	Report	1	10% (10)	15	LO # 1-14
Summative assessment	Midterm Exam	2 hr	10% (10)	8	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	Basic terminology, Populations and Samples.
Week 2	Sample spaces and events. Axioms for probability and their consequences.
Week 3	Conditional probabilities. Bayes' formula. Independent events.
Week 4	Definition of random variable. Discrete random variables. Expectation and variance.
Week 5	Bayes Theorem, Discrete Probability Distributions, The cumulative distribution function.
Week 6	Probability density function. Expectation and variance of continuous random variables.
Week 7	Binomial Distribution, Poisson Distribution, The Normal Distribution
Week 8	Midterm Exam
Week 9	Joint distribution functions. Marginal distributions. Independent random variables. Distributions of sums of independent random variables.
Week 10	Expectation and variance of sums of random variables. Covariance and correlation.
Week 11	Conditional expectation. Prediction.
Week 12	Graphical Representation - frequency tables and charts, Measures of Central Tendency, and Dispersion.
Week 13	Relationship Modelling, Pearson's Correlation Co-efficient
Week 14	Significance of the correlation co-efficient, Simple Linear Regression
Week 15	Chi Square test for association, Chi Square test of goodness of fit
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Tutorial)

المنهاج الاسبوعي الاضافي

	Material Covered
Each week, a question sheet related to the material presented in the theoretical lecture will be solved and debated.	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Probability & Statistics for Engineers & Scientists", Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying E. Ye, Pearson Education, 9th edition, (August 19, 2016), ISBN-13:978-1292161365.	Yes
Recommended Texts	"Essential Mathematics and Statistics for Science", Graham Currell, Antony Dowman, Wiley, 2nd edition (June 22, 2009), ISBN-13:978-0470694480.	No
Websites	https://users.cs.utah.edu/~jeffp/teaching/cs3130.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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Object Oriented Programming		Module Delivery
Module Type	S		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	CET2102		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Programming Essentials / CET1203	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Understand and apply object-oriented programming principles. 2. Design and implement object-oriented solutions to programming problems. 3. Utilize C++ libraries and frameworks for application development. 4. Implement data abstraction and encapsulation for secure and efficient code. 5. Plan and execute testing strategies for reliable programs. 6. Debug and optimize program performance for efficient execution.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate a clear understanding of object-oriented programming principles, including inheritance, polymorphism, and encapsulation. 2. Design and implement classes and objects to represent real-world entities, applying appropriate inheritance and encapsulation. 3. Utilize C++ libraries and frameworks effectively to develop robust and scalable applications. 4. Implement data abstraction and encapsulation techniques to ensure secure and efficient code. 5. Plan and execute comprehensive testing strategies to validate the functionality and reliability of object-oriented programs. 6. Identify and debug program errors using appropriate tools and techniques, enhancing program robustness. 7. Evaluate and optimize program performance through code analysis and profiling, improving execution efficiency. 8. Collaborate effectively with peers to develop object-oriented solutions to complex programming challenges.

	9. Apply exception handling techniques to handle errors and ensure program stability. 10. Demonstrate proficiency in utilizing debugging tools to identify and fix program errors. 11. Apply object-oriented design patterns and principles to analyze and solve programming problems. 12. Evaluate the efficiency and effectiveness of object-oriented solutions through critical analysis and optimization techniques.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A: Introduction to Object-Oriented Programming (8 hours)</u> - Overview of object-oriented programming principles and concepts - Classes, objects, and their relationships - Inheritance and polymorphism - Encapsulation and data abstraction <u>Part B: Designing Object-Oriented Solutions (12 hours)</u> - Problem analysis and requirements gathering - Identifying classes and objects - Object-oriented design principles and patterns - Designing class hierarchies and relationships - UML diagrams for visualizing designs <u>Part C: Implementing Object-Oriented Solutions in C++ (20 hours)</u> - C++ language essentials for object-oriented programming - Implementing classes and objects in C++ - Inheritance and polymorphism in C++ - Handling exceptions in C++ - Utilizing C++ libraries and frameworks <u>Part D: Testing and Debugging Object-Oriented Programs (12 hours)</u> - Testing methodologies and strategies - Unit testing and test-driven development - Integration testing and system testing - Debugging techniques and tools - Error handling and exception management <u>Part E: Optimization and Performance Analysis (8 hours)</u>

	- Profiling and performance analysis tools - Identifying performance bottlenecks - Optimization techniques for object-oriented programs - Memory management and resource optimization <u>Part F: Collaborative Object-Oriented Programming (8 hours)</u> - Collaborative development environments and version control systems - Code reviews and best practices - Pair programming and team collaboration - Communication and coordination in object-oriented projects <u>Part G: Project Work and Application Development (20 hours)</u> - Applying object-oriented principles and techniques in a practical project - Developing a complete application using C++ and object-oriented design - Project planning, implementation, and documentation - Integration of various modules and testing the application
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The learning and teaching strategies for the Object-Oriented Programming Course include lectures to introduce concepts, practical exercises for hands-on programming, group discussions for collaboration, case studies for real-world application, code reviews for feedback, practical projects to apply knowledge, guest lectures for industry insights, online resources for self-study, assessments to evaluate understanding, and presentations to enhance communication skills. These strategies aim to actively engage students, develop their programming abilities, and foster a deep understanding of object-oriented programming principles.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem)	79	Structured SWL (h/w)	5.26
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الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.73
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Object-Oriented Programming
Week 2	Classes, Objects, and Relationships
Week 3	Inheritance and Polymorphism principles
Week 4	Encapsulation and Data Abstraction
Week 5	Problem Analysis and Requirements Gathering
Week 6	Object-Oriented Design Principles and Patterns
Week 7	Mid-term Exam
Week 8	C++ Language Essentials and Advanced Topics
Week 9	Implementing Classes and Objects in C++
Week 10	Implementing Inheritance and Polymorphism in C++

Week 11	Handling Exceptions in C++
Week 12	Utilizing C++ Libraries and Frameworks
Week 13	Testing Methodologies and Strategies in C++
Week 14	Debugging Techniques and Tools in C++
Week 15	Optimization and Performance Analysis in C++
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to C++ programming environment and basic syntax.
Week 2	Implementing simple classes and objects.
Week 3	Experimenting with inheritance and polymorphism in C++.
Week 4	Implementing data abstraction and encapsulation.
Week 5	Problem-solving exercise using object-oriented design principles and patterns.
Week 6	Utilizing C++ libraries and frameworks for application development.
Week 7	Midterm Exam (No lab session).
Week 8	Implementing exception handling techniques in C++.

Week 9	Testing and debugging strategies for object-oriented programs.
Week 10	Profiling and performance analysis of C++ programs.
Week 11	Code optimization techniques for object-oriented programming.
Week 12	Collaborative programming exercise utilizing version control systems.
Week 13	Implementing advanced data structures using object-oriented techniques.
Week 14	Project work and application development using object-oriented concepts.
Week 15	review and practice exercises, Preparatory for Final Exam.
Week 16	Final Exam (No lab session).

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Object-Oriented Programming in C++" by Robert Lafore	
Recommended Texts	"Design Patterns: Elements of Reusable Object-Oriented Software" by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides	
Websites	https://www.w3schools.com/cpp/cpp_oop.asp	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Computer Organization and Applications		Module Delivery	
Module Type	core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET2103			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		
Administering Department	CET	College	EETC	
Module Leader			e-mail	
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	

Scientific Committee Approval Date	29/10/2023	Version Number	1.0
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Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	32. Understand the basic components and organization of a computer system. 33. Explain the function and operation of the CPU, memory, and I/O devices. 34. Analyze and evaluate different computer architectures and their trade-offs. 35. Design and implement basic computer systems using appropriate hardware and software components. 36. Demonstrate an understanding of the relationship between computer organization and computer performance. 37. Apply knowledge of computer organization principles to solve real-world computing problems. 38. To develop essential skills in creating, saving, and opening documents in Microsoft Word, including formatting text and paragraphs and working with styles and themes. 39. To explore advanced features in Microsoft Word, such as page layout options, working with headers, footers, and page numbers, and incorporating tables, images, and objects. 40. To introduce spreadsheets and worksheets in Microsoft Excel, and develop students' skills in data entry, manipulation, and basic formulas and functions. 41. To delve into advanced Microsoft Excel features, including working with ranges and cells, sorting and filtering data, and creating charts and graphs. 42. To guide students in creating and editing slides in Microsoft PowerPoint, applying themes and templates, and adding text, images, and multimedia elements. 43. To explore advanced PowerPoint features, such as slide transitions, animations, using SmartArt and shapes, and utilizing presenter tools and slide show options.
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Module Learning Outcomes مخرجات التعلم للمادة الدراسية	61. Understand the basic components and organization of a computer system. 62. Explain the function and operation of the CPU, memory, and I/O devices. 63. Analyze and evaluate different computer architectures and their trade-offs. 64. Design and implement basic computer systems using appropriate hardware and software components. 65. Demonstrate an understanding of the relationship between computer organization and computer performance. 66. Apply knowledge of computer organization principles to solve real-world computing problems. 67. demonstrate the ability to evaluate and compare different computer organization techniques, such as memory management strategies and caching optimizations, to improve system performance. 68. Understand computer architectures, including their performance characteristics, and understand the impact of design choices on computer performance 69. Develop practical skills in using simulation tools, emulators, and programming languages to design, implement, and test computer organization concepts. 70. Analyze and identify performance bottlenecks in computer systems and propose appropriate optimizations to improve system efficiency. 71. Understand the principles and challenges of memory management, including memory allocation, deallocation, and garbage collection. 72. Apply knowledge of cache memory organization and mapping techniques to analyze cache behavior and optimize cache utilization. 73. Demonstrate a solid understanding of Microsoft Word, Excel, and PowerPoint, including their key features, user interfaces, and common functions. 74. Create, format, and manage documents effectively in Microsoft Word, utilizing styles, themes, page layout options, headers, footers, tables, images, and objects. 75. Utilize Microsoft Excel for data entry, manipulation, basic calculations using formulas and functions, sorting and filtering data, and creating charts and graphs. 76. Develop proficiency in creating and editing slides, applying themes, templates, and multimedia elements, and utilizing advanced features in Microsoft PowerPoint.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to Computer Organization Basic computer architecture and components Von Neumann architecture Instruction execution cycle Memory Organization Memory hierarchy and cache memory Virtual memory and paging techniques Memory management and allocation strategies PU Organization and Instruction Set Architecture (ISA)

	CPU components: ALU, registers, control unit Instruction formats and addressing modes Input/Output (I/O) Organization I/O devices and interfaces Polling, interrupts, and DMA I/O communication and bus architectures
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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 type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Computer system organization and architecture.
Week 2	Von Neumann architecture and its components
Week 3	Interfacing devices and system buses • Tristate buffer • Decoder • Multiplexer • Address bus, data bus and control bus (specifications, function and interfacing)
Week 4	Memory hierarchy • Review of memory classification • Cache memory levels, Replacement Techniques, effective access time, read and write protocol

Week 5-6	Memory organization • Memory requirements and memory expansion • Memory addresses and memory map
Week 7	Midterm Exam
Week 8	Basic computer microoperations • Registers types, registers interconnection and data transfer • Arithmetic microoperation • Logical microoperation
Week 9	Computer instructions • instruction type and format • instruction addressing mode
Week 10	Control and timing unit • decoding and executing instruction • instruction cycle
Week 11-12	Instruction Set • register reference instruction • memory reference instruction • I/O reference instruction
Week 13	Stack memory
Week 14	Input/output (I/O) Organization
Week 15	Interrupt and subroutines

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
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Week 1	Introduction to Computer Organization ,Familiarization with the lab environment and tools
Week 2	hardware components: CPU, memory, and I/O devices
Week 3	Introduction to Assembly Language Programming, microprocessor instruction set
Week 4	register and memory transfer instructions
Week 5	Arithmetic instructions
Week 6	Logical Instructions
Week 7	Stack instructions
Week 8	Loop and Subroutine programs
Week 9	Writing and executing simple assembly language programs
Week 10	Introduction to Lab Environment and Office Suite: Microsoft Word Lab - Creating, editing, and formatting documents. Inserting and formatting images and tables.
Week 11	Microsoft Excel Lab - Creating spreadsheets and entering data. Formulas and functions for calculations.
Week 12	Data Analysis Lab with Excel - Advanced formula and function exercises. Sorting, filtering, and analyzing data.
Week 13	Microsoft PowerPoint Lab - Creating, editing, and designing slides. Adding multimedia elements and animations.
Week 14	Dealing with google form, customized the design, control the access, presents answers.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Computer Architecture and Organization " by Moris Mano	no
Recommended Texts	"8085 Microprocessor and Programming "by Ramesh S. Gaonkar	yes
Websites	https://www.tutorialspoint.com/computer_organization/index.asp	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Electronic Fundamentals		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET2104		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	

Scientific Committee Approval Date	29/10/2023	Version Number	1.0
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Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CET1202	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	44. To understand materials conductivity, semiconductor materials, and types 45. This is the basic subject for all electronic circuits and devices. 46. This course deals with first and the simplest semiconductor device, diode, diode physical construction, biasing, characteristics, application circuits and Zener 47. Mathematical derivation and implementation of the load line analysis, and Q point with in diode characteristics curve to develop problem solving skills and understanding of diode circuits 48. This course deals with second semiconductor device, BJT This course deals with BJT physical construction, biasing, configuration methods, input and output characteristics 49. To understand the D.C biasing of BJT and circuit types , analysis and calculations of BJT parameters 50. To understand and construct re model for BJT circuits 51. To deal with small signal analysis of BJT
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	77. Recognize classifications of materials according to its conductivity. 78. Identify the semiconductor material characteristics and classifications 79. Recognize the physical structure and properties of P and N layers 80. Identify diode as a first example of semiconductor devices.

	81. Discuss diode physical construction, biasing, and characteristics 82. Identify the variable parameters of diodes, and V threshold 83. Summarize what is meant by Load line analysis , and Q point 84. Identify the applications of diodes in electrical circuits using AC. And DC. Power supplies 85. To understand the concept of Zener region and the differences between zener and original diodes 86. To solve zener circuits and calculate its voltage current with different cases 87. To understand and discuss the second semiconductor device which is Transistor (Bipolar Junction Transistor)(BJT) 88. To discuss BJT physical construction, Operation, and configuration methods 89. To understand and implement input and output Characteristics of each configuration method and load line and Q point implementations 90. To implement and solve BJT biasing circuit types and calculations of important parameters of BJT in DC. Biasing state 91. Design BJT circuit types by using Quesent point parameters 92. Understand and construct re model for BJT circuits 93. Derive and calculate Z_i, Z_o A_v and A_i from re model of BJT circuits 94. Understand and calculate small signal analysis of BJT .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Semiconductor Materials Energy Levels , n- and p-Type, Semiconductor Diode Construction ,biasing, Characteristics and Zener Diodes, Load-Line Analysis [8 hrs] . Series Diode Configurations with DC Inputs, Parallel and Series-Parallel Configurations Sinusoidal Inputs Half-Wave Rectification, Full-Wave Rectification Clippers ,Clampers , Zener Diodes Voltage-Multiplier Circuit [10hrs] Transistor Construction , Transistor Operation ,Common-Base Configuration Transistor Amplifying Action ,Common-Emitter Configuration ,Common-Collector Configuration ,Limits of Operation [8hrs]

	Operating Point, Fixed-Bias Circuit , Emitter-Stabilized Bias Circuit , Voltage-Divider Bias , DC Bias with Voltage Feedback , Miscellaneous Bias Configurations, Design Operations Transistor Switching Networks, [[15 hrs] Revision problem classes [12 hrs] BJT Transistor Modeling The Important Parameters: Z_i, Z_o, A_v, A_i The r e Transistor Model The Hybrid Equivalent , small signal analysis Common-Emitter Fixed-Bias Configuration , Voltage-Divider Bias CE Emitter-Bias Configuration Emitter-Follower Configuration Common-Base Configuration[11 hr]
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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 type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction, Semiconductor Materials, Energy Levels, Extrinsic Materials—n- and p-Type
Week 2	Semiconductor Diode construction, biasing, characteristics, Zener region
Week 3	Load-Line Analysis, RESISTANCE LEVELS, DIODE EQUIVALENT CIRCUITS
Week 4	Series Diode Configurations with DC Inputs, Parallel and Series- Parallel Configurations
Week 5	Sinusoidal Inputs; Half-Wave Rectification, Full-Wave Rectification

Week 6	Midterm Exam
Week 7	Clipper's series and parallel, Clampers, Zener Diodes, Introduction, Transistor Construction
Week 8	Transistor Operation, Common-Base Configuration Transistor, Amplifying Action, Common-Emitter Configuration, Limits of Operation
Week 9	Operating Point, Fixed-Bias Circuit, Emitter-Stabilized Bias Circuit,
Week 10	Voltage-Divider Bias, DC Bias with Voltage Feedback, Miscellaneous Bias Configurations
Week 11	Design Operations, Transistor Switching Networks
Week 12	Amplification in the AC Domain, BJT Transistor Modeling, The Important Parameters: Z_i , Z_o , A_v , A_{The} re Transistor Model.
Week 13	Small signal analysis
Week 14	Common-Emitter Fixed-Bias Configuration - Voltage-Divider Bias
Week 15	CE Emitter-Bias Configuration Emitter-Follower Configuration Common-Base Configuration

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction
Week 2	Lab 2: Diode characteristics
Week 3	Lab 3 Zener diode characteristics
Week 4	Lab 4 Half wave rectifier
Week 5	Lab 5: full wave rectifier
Week 6	Half and full wave rectifier with filter
Week 7	Lab 7: clippers

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electronic devices and circuit theory Poylested	Yes

Recommended Texts	.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Electronic Fundamentals	Module Delivery

Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET2104		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	3
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CET1202	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims	
أهداف المادة الدراسية	52. To understand materials conductivity, semiconductor materials, and types 53. This is the basic subject for all electronic circuits and devices.

	54. This course deals with first and the simplest semiconductor device, diode, diode physical construction, biasing, characteristics, application circuits and Zener 55. Mathematical derivation and implementation of the load line analysis, and Q point with in diode characteristics curve to develop problem solving skills and understanding of diode circuits 56. This course deals with second semiconductor device, BJT This course deals with BJT physical construction, biasing, configuration methods, input and output characteristics 57. To understand the D.C biasing of BJT and circuit types , analysis and calculations of BJT parameters 58. To understand and construct re model for BJT circuits 59. To deal with small signal analysis of BJT
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	95. Recognize classifications of materials according to its conductivity. 96. Identify the semiconductor material characteristics and classifications 97. Recognize the physical structure and properties of P and N layers 98. Identify diode as a first example of semiconductor devices. 99. Discuss diode physical construction, biasing, and characteristics 100. Identify the variable parameters of diodes, and V threshold 101. Summarize what is meant by Load line analysis , and Q point 102. Identify the applications of diodes in electrical circuits using AC. And DC. Power supplies 103. To understand the concept of Zener region and the differences between zener and original diodes 104. To solve zener circuits and calculate its voltage current with different cases 105. To understand and discuss the second semiconductor device which is Transistor (Bipolar Junction Transistor)(BJT) 106. To discuss BJT physical construction, Operation, and configuration methods 107. To understand and implement input and output Characteristics of each configuration method and load line and Q point implementations 108. To implement and solve BJT biasing circuit types and calculations of important parameters of BJT in DC. Biasing state 109. Design BJT circuit types by using Quesent point parameters 110. Understand and construct re model for BJT circuits 111. Derive and calculate Z_i, Z_o A_v and A_i from re model of BJT circuits 112. Understand and calculate small signal analysis of BJT

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Semiconductor Materials Energy Levels , n- and p-Type, Semiconductor Diode Construction ,biasing, Characteristics and Zener Diodes, Load-Line Analysis [8 hrs] . Series Diode Configurations with DC Inputs, Parallel and Series-Parallel Configurations Sinusoidal Inputs Half-Wave Rectification, Full-Wave Rectification Clippers ,Clampers , Zener Diodes Voltage-Multiplier Circuit [10hrs] Transistor Construction , Transistor Operation ,Common-Base Configuration Transistor Amplifying Action ,Common-Emitter Configuration ,Common-Collector Configuration ,Limits of Operation [8hrs] Operating Point, Fixed-Bias Circuit , Emitter-Stabilized Bias Circuit , Voltage-Divider Bias , DC Bias with Voltage Feedback , Miscellaneous Bias Configurations, Design Operations Transistor Switching Networks, [[15 hrs] Revision problem classes [12 hrs] BJT Transistor Modeling The Important Parameters: Z_i, Z_o, A_v, A_i The r e Transistor Model The Hybrid Equivalent , small signal analysis Common-Emitter Fixed-Bias Configuration , Voltage-Divider Bias CE Emitter-Bias Configuration Emitter-Follower Configuration Common-Base Configuration[11 hr]

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 type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction, Semiconductor Materials, Energy Levels, Extrinsic Materials—n- and p-Type
Week 2	Semiconductor Diode construction, biasing, characteristics, Zener region
Week 3	Load-Line Analysis, RESISTANCE LEVELS, DIODE EQUIVALENT CIRCUITS
Week 4	Series Diode Configurations with DC Inputs, Parallel and Series- Parallel Configurations
Week 5	Sinusoidal Inputs; Half-Wave Rectification, Full-Wave Rectification
Week 6	Midterm Exam
Week 7	Clipper's series and parallel, Clampers, Zener Diodes, Introduction, Transistor Construction
Week 8	Transistor Operation, Common-Base Configuration Transistor, Amplifying Action, Common-Emitter Configuration, Limits of Operation
Week 9	Operating Point, Fixed-Bias Circuit, Emitter-Stabilized Bias Circuit,
Week 10	Voltage-Divider Bias, DC Bias with Voltage Feedback, Miscellaneous Bias Configurations
Week 11	Design Operations, Transistor Switching Networks
Week 12	Amplification in the AC Domain, BJT Transistor Modeling, The Important Parameters: Z_i , Z_o , A_v , A_{re} Transistor Model.
Week 13	Small signal analysis
Week 14	Common-Emitter Fixed-Bias Configuration - Voltage-Divider Bias
Week 15	CE Emitter-Bias Configuration Emitter-Follower Configuration Common-Base Configuration

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction
Week 2	Lab 2: Diode characteristics
Week 3	Lab 3 Zener diode characteristics

Week 4	Lab 4 Half wave rectifier
Week 5	Lab 5: full wave rectifier
Week 6	Half and full wave rectifier with filter
Week 7	Lab 7: clippers

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electronic devices and circuit theory Poylested	Yes
Recommended Texts	.	No
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language II		Module Delivery
Module Type	B		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MTU1003		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	dr.oras@mtu.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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. Provide students with essential information in the English language in association with reading, writing and speaking skills, and knowing more English vocabulary. 2. To understand sentences, tenses, and practicing writing. 3. This module works towards enhancing students' English language competencies along with their technical or professional knowledge. 4. Enhancing students' communication skills in English can result in better job opportunities in the future
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The student will have the ability to: 1. Know the English skills of reading, and writing. 2. Recognize other English language skills such as: grammar, vocabulary. 3. Understand and appreciate the importance of grammar aspects and vocabulary to increase the ability of communicating ideas about the English language. 4. Understand sentences with multiple clauses, and comparative and superlative. 5. Understand time expression in tenses, and active and passive voice. 6. Discuss distinguish words such as do and make, like and alike, and other and another. 7. Discuss the various skills of writing such as writing essays, developing supporting ideas, and writing a paragraph. 8. Enhance students' communication skills in English.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A: Sentences and Tenses.</u> an overview of verb tenses, comparatives and superlatives, time expression in tenses, active and passive voice, distinguish words, Verb Patterns, Quantity, Time and Conditional Clauses, and articles. [15 hrs] <u>Part B: Reading and Writing Skills</u>

	Writing essays, expressing yourself, common expressions, developing supporting ideas, types of writing, and how to write a paragraph. [15 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategies that will be adopted in delivering this module are: - Allow students to actively participate in the learning process with class discussions and exercises that support the initiative. - Use didactic questioning through questions to determine student understanding of the material. - Writing an assignment and report that encourages students to clarify and organize their thinking and independently research and present on a topic.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3 , 10	LO# 1-2, LO# 3-9
	Assignments	2	20% (10)	4, 12	LO# 1-3, LO# 3-11
	Projects / Lab.	NA			
	Report	1	10% (10)	Continuou s	
Summative assessment	Midterm Exam	2hr	10% (10)	5	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	Unit 1: Grammar: Tenses (Present, Past, and Future), Questions, Questions word Vocabulary: Parts of speech, adjective, preposition, word with more than one meaning Reading and writing Skill, Everyday English (Social Expression)
Week 2	Unit 2: Grammar: Present Tenses (Present Simple, Present Continuous) Tens, have/have got Vocabulary: Description countries, Collection Reading and writing Skill, make conversation, Asking question
Week 3	Unit 3: Grammar: Past Tenses (Past Simple, Past Continuous) Vocabulary: Irregular verbs, making connections, nouns, verbs, and adjectives, Making negatives Reading and writing Skill, Everyday English (Time Expression)
Week 4	Unit 4: Grammar: Quantity, Articles, and some and Any

	Vocabulary: Buying Things Reading and writing Skill, Everyday English (Prices and shopping)
Week 5	Midterm Exam
Week 6	Unit 5: Grammar: Verb Patterns 1, Future intentions Vocabulary: Hot verbs Reading and writing skills, Everyday English (How do you feel?) Unit 6: Grammar: What's it like?, Comparative and superlative adjectives. Vocabulary: Talking about towns, Money, Synonyms and antonyms Reading and writing Skill, Everyday English (Directions)
Week 7	Unit 7: Grammar: Present Perfect and Past Simple, for and since, Tense revision Vocabulary: Past participles, Adverbs, Word pairs. Reading and writing Skill, Everyday English (short answers)
Week 8	Unit 8: Grammar: Have (got) to, Should, Must Vocabulary: Jobs, Traveling abroad, Words that go together, Compound nouns Reading and writing Skill, Everyday English (At the doctor's)
Week 9	Unit 9: Grammar: Time and Conditional Clauses, What if? Vocabulary: Hot verbs, Hotels Reading and writing Skill, Everyday English (In a hotel)
Week 10	Unit 10: Grammar: Verb Patterns 2, Infinitives, Purpose, (What, etc.+ infinitive), (something, etc.+ infinitive) Vocabulary: Shops, describe feelings and situations. Reading and writing Skill, Everyday English (Exclamations)
Week 11	Unit 11: Grammar: Active and Passive Voice Vocabulary: Verbs and past participles, verbs and nouns that go together Reading and writing Skill, Everyday English (Notices)
Week 12	Unit 12: Grammar: Second conditional, might Vocabulary: Phrasal verbs Reading and writing Skill, Everyday English (Social expression 2)

Week 13	Unit 13: Grammar: Present Perfect Continuous, Present Perfect Simple versus Continuous Vocabulary: Job and the alphabet game, Word formation, Adverb Reading and writing Skill, Everyday English (Telephoning)
Week 14	Unit 14: Grammar: Past Perfect, Reported statements Vocabulary: Word in context Reading and writing Skill, Everyday English (Saying goodbye)
Week 15	Grammar: Distinguish make and do, will and would, like, alike, unlike, and dislike, and other, another, and others Vocabulary Reading and writing Skill

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	New Headway Plus/ Pre-Intermediate, John and Liz Soars, Oxford University Press	NO
Recommended Texts	Understanding and Using English Grammar, 5 th Edition, Betty S. Azar Stacy A. Hagen.	NO
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors

(50 - 100)	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	The crimes of the Ba'ath regime	Module Delivery
Module Type	B	☒ Theory
Module Code	MTU1007	☐ Lecture
ECTS Credits	2	☐ Lab
SWL (hr/sem)	50	☐ Tutorial
		☐ Practical
		☐ Seminar

Module Level	2	Semester of Delivery	3
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	يهدف هذا المقرر الدراسي إلى تعزيز فهم الطلاب للجرائم والانتهاكات التي وقعت خلال فترة نظام البعث في العراق وتأثيرها على الأفراد والمجتمع، وتشجيع التحليل والنقاش حول هذه القضايا المهمة. ومن أبرز الأهداف للمادة الدراسية هي اني يكون الطالب قادراً على أن : 1. فهم مفهوم الجرائم وأقسامها. 2. دراسة جرائم نظام البعث والقوانين المتعلقة بها. 3. التعرف على الجرائم النفسية والاجتماعية وآثارها على الفرد والمجتمع. 4. تحليل الانتهاكات القانونية في العراق، بما في ذلك الانتهاكات لحقوق الإنسان والجرائم ذات الصلة. 5. فهم الجرائم البيئية وآثارها، بما في ذلك التلوث وتدمير المدن والقرى وتجفيف الأهوار.
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	6. دراسة جرائم المقابر الجماعية وفهم أحداث المقابر والتصنيف الزمني لها في العراق.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	مخرجات التعلم للمادة الدراسية هي: 1. فهم مفهوم الجرائم وقدرة الطلاب على تصنيف الجرائم وفقاً لأقسامها. 2. تحليل جرائم نظام البعث وفهم القوانين المتعلقة بها، بما في ذلك الجرائم الدولية. 3. القدرة على التعرف على الجرائم النفسية لنظام البعث وفهم الآثار النفسية لجرائم نظام البعث على الأفراد والمجتمع. 4. القدرة على التعرف على الجرائم الاجتماعية لنظام البعث الآثار الاجتماعية لجرائم نظام البعث على الأفراد والمجتمع. 5. التعرف على الانتهاكات القانونية لنظام البعث في العراق وفهم أنواع الانتهاكات ومكان احتجاز الأفراد. 6. التعرف على صور انتهاكات حقوق الإنسان وجرائم السلطة التي وقعت خلال فترة نظام البعث. 7. التعرف على الانتهاكات السياسية والعسكرية لنظام البعث. 8. فهم الجرائم البيئية لنظام البعث والقدرة على تحليل تأثيرها على البيئة والمجتمع. 9. دراسة جرائم المقابر الجماعية لنظام البعث. 10. فهم الأحداث المرتبطة بجرائم المقابر الجماعية وتصنيفها زمنياً.
Indicative Contents المحتويات الإرشادية	المحتويات الإرشادية في مادة اللغة تشمل مجموعة من المفاهيم والمواضيع التي يتم تغطيتها خلال عملية التعلم. ومن بين المحتويات الإرشادية المهمة: 1. تعريف الجريمة لغة واصطلاحاً، مفهوم الجريمة، أقسام الجريمة 2. جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005 3. الجرائم النفسية والاجتماعية وأثارها 4. عسكرة المجتمع، موقف النظام البعثي من الدين 5. انتهاكات القوانين العراقية، صور انتهاكات حقوق الإنسان وجرائم السلطة 6. بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث 7. أماكن السجون والاحتجاز لنظام البعث 8. الجرائم البيئية لنظام البعث في العراق 9. جرائم المقابر الجماعية 10. أحداث مقابر الإبادة الجماعية المرتكبة من النظام البعثي في العراق 11. التصنيف الزمني لمقابر الإبادة الجماعية في العراق للمدة 1963م - 2003م

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	استراتيجيات التعلم والتعليم المستخدمة في مادة جرائم حزب البعث البائد تشمل مجموعة متنوعة من النهج والتقنيات التي تعزز عملية التعلم للطلاب. من بين هذه الاستراتيجيات: 1. التفاعل النشط: يتم تشجيع الطلاب على المشاركة والمشاركة الفعالة في الدروس من خلال المناقشات الجماعية والأنشطة التفاعلية. 2. التعلم التعاوني: يشجع التعاون والتعاون بين الطلاب من خلال العمل الجماعي والمشاريع الجماعية، حيث يتعاون الطلاب مع بعضهم البعض لتحقيق أهداف التعلم المحددة. 3. استخدام التقنيات الحديثة: يستفيد الطلاب من استخدام التكنولوجيا في عملية التعلم، مثل استخدام
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	الحواسيب والإنترنت للبحث والتعلم الذاتي. 4. توفير ردود فعل فورية: يتم توفير ردود فعل فورية وتقييم مستمر للطلاب، سواء عن طريق التقييمات الشفهية أو الكتابية، مما يساعدهم على تحسين أدائهم وتطوير مهاراتهم. 5. التنوع في وسائل التواصل: يتم استخدام مجموعة متنوعة من وسائل التواصل والتعليم، مثل المحاضرات التوضيحية، والمناقشات الجماعية، والأنشطة العملية، والعروض التقديمية، لتلبية احتياجات وأساليب التعلم المختلفة للطلاب.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعية النظرية

	تعريف الجريمة لغة واصطلاحاً، مفهوم الجريمة، أقسام الجريمة	الأسبوع الأول
	جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005	الأسبوع الثاني
	الجرائم النفسية لنظام البعث وفهم الآثار النفسية لجرائم نظام البعث على الأفراد والمجتمع.	الأسبوع الثالث
	الجرائم الاجتماعية لنظام البعث وفهم الآثار الاجتماعية لجرائم نظام البعث على الأفراد والمجتمع.	الأسبوع الرابع
	انتهاكات القوانين العراقية	الأسبوع الخامس
	بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث	الأسبوع السادس
	امتحان نصف الفصل	الأسبوع السابع
	الجرائم البيئية لنظام البعث في العراق (التلوث الحربي وسياسة الأرض المحروقة)	الأسبوع الثامن
	تجفيف الأهوار و تجريف بساتين النخيل والأشجار والمزروعات	الأسبوع التاسع والعاشر
	جرائم المقابر الجماعية وأحداث مقابر الإبادة الجماعية المرتكبة من النظام البعث في العراق	الأسبوع الحادي عشر و الأسبوع الثاني عشر
	التصنيف الزمني لمقابر الإبادة الجماعية في العراق للمدة من (1963-2003) م	الأسبوع الثالث عشر والرابع عشر والخامس عشر
	التهنية لامتحان النهائي	الأسبوع السادس عشر

Module Evaluation

تقييم المادة الدراسية

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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	منهاج وزارة التعليم العالي والبحث العلمي العراقية - جرائم نظام البحث في العراق 2023	Yes
Recommended Texts		No
Websites	The Collage E-Library	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Advanced Engineering Mathematics		Module Delivery
Module Type	S		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	CET2201		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	Four
Administering Department	CET	College	EECT
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	

Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CET2101	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	18. To develop problem solving skills complex analysis. 19. To understand power series. 20. To the way around Fourier series. 21. To get the grip on using Laplace transform. 22. To develop a good understanding of ODEs. 23. This course deals with Advanced Engineering Mathematics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Describe Complex environment. 2. Discuss derivative of Analytic Function. 3. Describe Exponential, Trigonometric and Hyperbolic Functions. 4. Explain Line Integral in the Complex Plane and Cauchy's Integral Formula.

	5. Using power Series and how to expand a function 6. Identify elements of Fourier Series. 7. Identify elements of Laplace Transform. 8. Discuss different aspects of First-Order ODEs. 9. Identify Bernoulli Equation and Population Dynamics. 10. Discuss different aspects of Second-Order Linear ODEs. 11. Using Variation of Parameters. 12. Discuss different aspects of Higher Order Linear ODEs. 13. Using Power Series to solve ODE. 14. Explain Fourier Series solution of ODE. 15. Discuss Laplace Transform solution of ODE.
Indicative Contents المحتويات الإرشادية	<u>Part A – Complex Analysis.</u> This part includes Complex Numbers. Polar Form of Complex Numbers. Powers and Roots. Complex variables. Complex Function. Derivative. Analytic Function. Cauchy–Riemann and Laplace’s Equation. Exponential, Trigonometric and Hyperbolic Functions. Euler’s Formula. Logarithm. Line Integral in the Complex Plane. Cauchy’s Integral Formula. Derivatives of Analytic Functions. [12 hrs] + Revision problem classes in weekly tutorials [4 hrs] <u>Part B – Preliminaries to Methods of solving ODE.</u> This part includes Power Series. Functions Given by Power Series. Fourier Series. Arbitrary Period. Even and Odd Functions. Fourier Analysis for Periodic Functions. Fourier series Formula of a function. Differentiation and Integration of Fourier Series Laplace Transform. Transforms of Derivatives and Integrals. Table of Laplace Transforms. inverse Laplace transform [9 hrs] + Revision problem classes in weekly tutorials [3 hrs]

	<u>Part C – ODE.</u> This part includes First-Order ODEs. Separable ODEs. Exact ODEs. Integrating Factors. Linear ODEs. Bernoulli Equation. Population Dynamics. Second-Order Linear ODEs. Homogeneous. Homogeneous with Constant Coefficients. Nonhomogeneous ODEs. Solution by Variation of Parameters. Higher Order Linear ODEs. Homogeneous Linear ODEs. Homogeneous Linear ODEs with Constant Coefficients. Nonhomogeneous Linear ODEs. Power Series solution of ODE. Fourier Series solution of ODE. Laplace Transform solution of ODE. [24 hrs] + Revision problem classes in weekly tutorials [8 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This module will primarily focus on encouraging students to participate in the activities, as well as refining and developing their critical thinking skills. This will be achieved through lectures, tutorials, discussions, and grading activities.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1-4, LO #5-9
	Assignments	2	20% (10)	3, 11	LO # 1,2 , LO# 3-10
	Projects / Lab.	N/A			
	Report	1	10% (10)	Continuous	LO#1-14
Summative assessment	Midterm Exam	2 hr	10% (10)	8	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	Complex Numbers. Polar Form of Complex Numbers. Powers and Roots. Complex variables.
Week 2	Complex Function. Derivative. Analytic Function. Cauchy–Riemann and Laplace’s Equation.
Week 3	Exponential, Trigonometric and Hyperbolic Functions. Euler’s Formula. Logarithm.
Week 4	Line Integral in the Complex Plane. Cauchy’s Integral Formula. Derivatives of Analytic Functions
Week 5	Power Series. Functions Given by Power Series.
Week 6	Fourier Series. Arbitrary Period. Even and Odd Functions. Fourier Analysis for Periodic Functions. Fourier series Formula of a function. Differentiation and Integration of Fourier Series

Week 7	Laplace Transform. Transforms of Derivatives and Integrals. Table of Laplace Transforms. inverse Laplace transform
Week 8	Midterm Exam
Week 9	First-Order ODEs. Separable ODEs. Exact ODEs. Integrating Factors. Linear ODEs. Bernoulli Equation. Population Dynamics.
Week 10	Second-Order Linear ODEs. Homogeneous. Homogeneous with Constant Coefficients.
Week 11	Nonhomogeneous ODEs. Solution by Variation of Parameters.
Week 12	Higher Order Linear ODEs. Homogeneous Linear ODEs. Homogeneous Linear ODEs with Constant Coefficients. Nonhomogeneous Linear ODEs.
Week 13	Power Series solution of ODE.
Week 14	Fourier Series solution of ODE.
Week 15	Laplace Transform solution of ODE.

Delivery Plan (Weekly Tutorial)

المنهاج الاسبوعي الاضافي

Material Covered

Each week, a question sheet related to the material presented in the theoretical lecture will be solved and debated.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Advanced Engineering Mathematics ", Erwin Kreyszig, Wiley, 10th edition (August 16, 2011), ISBN-13: 978-0470458365.	Yes

Recommended Texts	"Differential Equations for Engineers and Scientists", Yunus Cengel, William Palm, McGraw Hill, 1st edition (January 31, 2012), ISBN-13: 978-0073385907.	No
Websites	https://www.coursera.org/learn/differential-equations-engineers	

Grading Scheme

مخطط الدرجات

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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Python Programming		Module Delivery	
Module Type	S		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET2202			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	2	Semester of Delivery		
Administering Department	CET	College	EETC	
Module Leader			e-mail	
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Programming Essentials / CET1203	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	60. Introduce students to the fundamental concepts and principles of Python programming language. 61. Develop students' proficiency in writing Python code and solving programming problems. 62. Familiarize students with essential programming constructs, such as variables, data types, control flow structures, and functions. 63. Provide students with a solid foundation in object-oriented programming (OOP) and its application in Python. 64. Enable students to work with various data structures and perform operations on them. 65. Prepare students for practical application of Python in real-world scenarios, such as data manipulation, web scraping, and GUI development.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamentals of Python programming language, including variables, data types, and basic operators. 2. Demonstrate proficiency in control flow structures, such as conditional statements and loops, to control program execution. 3. Develop functions and utilize function arguments to enhance code modularity and reusability. 4. Utilize exception handling techniques to effectively manage errors and ensure program robustness. 5. Gain familiarity with modules and packages to leverage existing code and extend Python's functionality. 6. Understand object-oriented programming (OOP) concepts and apply them to create classes, objects, and inheritance hierarchies. 7. Manipulate strings, lists, dictionaries, and sets to efficiently store and retrieve data. 8. Perform file handling operations, including reading from and writing to files. 9. Apply Python to practical tasks, such as web scraping, data manipulation, and analysis. 10. Demonstrate proficiency in working with files and directories, including navigating file systems and managing file permissions. 11. Develop graphical user interfaces (GUIs) using Python libraries to create interactive applications. 12. Prepare for exams by reviewing course materials, practicing exercises, and answering sample questions.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A: Introduction to Python and Basic Concepts (Estimated time: 10 hours)</u> Overview of Python programming language Installation and setup Variables and data types

	Basic operators Input and output operations <u>Part B: Control Flow and Functions (Estimated time: 16 hours)</u> Conditional statements (if, else, elif) Loops and iterations (for loop, while loop) Functions and function arguments Recursion <u>Part C: Data Structures and File Handling (Estimated time: 16 hours)</u> Strings and string manipulation Lists and list manipulation Dictionaries and sets File handling and input/output operations <u>Part D: Advanced Topics (Estimated time: 16 hours)</u> Exception handling and error management Modules and packages Object-oriented programming (OOP) concepts Classes, objects, inheritance, and polymorphism <u>Part E: Applications and Practical Projects (Estimated time: 16 hours)</u> Working with files and directories GUI programming Web scraping Data manipulation and analysis
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Effective learning and teaching strategies involve creating an engaging and interactive learning environment. This can be achieved through a combination of various approaches, such as incorporating active learning techniques like group discussions, problem-solving activities, and hands-on experiments. Additionally, employing visual aids, multimedia resources, and real-world examples can enhance comprehension and retention. Encouraging student participation and providing timely feedback also play vital roles in fostering
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student engagement and understanding. It is important to promote a growth mindset, encourage critical thinking, and create opportunities for collaboration and peer learning. By employing these strategies, educators can facilitate meaningful learning experiences and empower students to become active participants in their own learning journey.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Python, Variables, Data Types, and Basic Operators
Week 2	Control Flow and Conditional Statements
Week 3	Loops and Iterations
Week 4	Strings and String Manipulation
Week 5	Lists and List Manipulation
Week 6	Dictionaries and Sets
Week 7	Midterm Exam
Week 8	Functions and Function Arguments
Week 9	File Handling and Input/Output Operations
Week 10	Exception Handling and Error Management
Week 11	Modules and Packages
Week 12	Object-Oriented Programming (OOP) Concepts
Week 13	Classes and Objects
Week 14	Inheritance and Polymorphism
Week 15	Working with Files and Directories

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Python, Variables, and Basic Operators
Week 2	Control Flow and Conditional Statements
Week 3	Loops and Iterations
Week 4	Strings and String Manipulation
Week 5	Lists and List Manipulation
Week 6	Dictionaries and Sets
Week 7	Midterm Exam (No lab session).
Week 8	Functions and Function Arguments
Week 9	File Handling and Input/Output Operations
Week 10	Exception Handling and Error Management
Week 11	Modules and Packages
Week 12	Object-Oriented Programming (OOP) Concepts
Week 13	Classes and Objects
Week 14	Inheritance and Polymorphism
Week 15	Working with Files and Directories
Week 16	Final Exam (No lab session).

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Title: "Python Crash Course: A Hands-On, Project-Based Introduction to Programming" Author: Eric Matthes	
Recommended Texts	Title: "Learning Python" Author: Mark Lutz	No

Websites

URL: <https://realpython.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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Microprocessors		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET2203			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery	4	
Administering Department	CET	College	EETC	
Module Leader			e-mail	
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Computer Organization & Architecture (CET2103)	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	66. To understand the basic operating concept of specific microprocessor. 67. To study the hardware architecture of specific microprocessor. 68. To encode programs based on the specific processor language. 69. To solve problems encountered in the architecture of a specific microprocessor
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Module Learning Outcomes مخرجات التعلم للمادة الدراسية	113. Identify the basic characteristic of specific processor 114. Define the processor signals and their functions 115. Explain the architecture from the hardware point of view 116. Identify various machine cycle. 117. Explain the memory different interfacing techniques with the microprocessor. 118. Explain the input output different interfacing techniques with the microprocessor. 119. Explain the concept of Stack memory. 120. List the addressing mode of the processor instruction. 121. Encode different program based on assembly. 122. Perform different arithmetic and logical operations using the processor instruction set. 123. Encode different problems associative with branching instructions. 124. Solve problem encountered with delay and counter. 125. Identify different interrupt procedures. 126. Design different interfacing systems due to the problem requirements.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Microprocessor H/W architecture</u> --MP signals, MP operations, Machine cycle, memory interfacing, input-output devices interfaces [30hrs] <u>Part b – Microprocessor S/W architecture</u> --Instruction set, data transfer, arithmetic, logical. [25 hrs] --Stack register and stack area [15hrs] --Branching instructions and applications [20hrs] --Revision problem classes [10 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 type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - microprocessor evolution
Week 2	Basics specific microprocessor architecture and its specifications
Week 3	Microprocessor signals and machine cycle
Week 4	Memory organization, interfacing and memory map
Week 5	Input devices interfacing, Output devices interfacing
Week 6	Midterm Exam
Week 7	Introduction to microprocessor assembly language and addressing mode
Week 8	Data transfer instruction
Week 9	Arithmetic instructions
Week 10	logical instruction
Week 11	Stack register , stack area and related instructions
Week 12	Branching instruction
Week 13	Delay and counters
Week 14	Interrupt concept and types
Week 15	Subroutine

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to microprocessor kit
Week 2	Lab 2: key function definition, read/write memory location, read/write registers
Week 3	Lab 3: Data transfer instructions
Week 4	Lab 4: Arithmetic instructions
Week 5	Lab 5: logical instruction
Week 6	Lab 6: Stack instructions
Week 7	Lab 7: Branching instruction

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	8085 μ p architecture and programming_Gonkar	Yes
Recommended Texts	UNDERSTANDING 8085/8086 MICROPROCESSORS and PERIPHERAL ICs	no
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Analog Communications		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET2204			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	2	Semester of Delivery		
Administering Department	CET	College	EETC	
Module Leader			e-mail	
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0	
Relation with other Modules العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	CET2105	Semester	3	
Co-requisites module	None	Semester		

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	- Understanding the modulation and de-modulation - Viewing and knowledge Amplitude modulation and Frequency modulation. - Analyzing the advantage and disadvantage of AM over FM. - Analyzing the generation and detection each of AM and FM. - To develop problem solving skills and understanding of PM equations
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Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Basic Principles of modulation and de-modulation 2. Explain the Need for Modulation. 3. Define a Carrier Wave, Radio Frequency Spectrum, Sound and Radio Broadcasting 4. Identify Amplitude Modulation, Percent Modulation, Upper and Lower Sidebands 5. Explain Methods of Modulation. 6. Mathematical Analysis of a Modulated Carrier Wave 7. Discuss forms of Amplitude Modulation and Methods of Amplitude Modulation. 8. Describe the Power Relation in an AM Wave. 9. Identify modulating Amplifier Circuit: AM- Transmitter & Radio Receiver Essential Parameter 10. Explain the AM generation of SSB, DSB-SC balanced modulators (Cowan & Ring). 11. Summarize various demodulation type of AM Signal: AM-Detector (Envelope & Synchronous) 12. Identify the Frequency Modulation Process: Modulation Index, Deviation Ratio, Percent Modulation and FM Sidebands. 13. Discuss the relationship between the modulation index and number of sidebands. 14. List the various types of generation of FM (the direct method and indirect method) & demodulation or detection. 15. Identify the comparison between AM and FM. 16. Discuss Principles of FM Receiver: FM Discriminator (Foster – Seeley & Ratio Detector). 17. Explain the Phase modulation (PM) Definition. 18. Discuss the PM equation and PM wave forms
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A –MODULATION AND DEMODULATION: Need for Modulation,. Define a Carrier Wave, Radio Frequency Spectrum, Sound and Radio Broadcasting. (20 hr) Part B- Amplitude Modulation: Percent Modulation, Upper and Lower Sidebands , Methods of Modulation , Mathematical Analysis of a Modulated Carrier Wave, forms of Amplitude Modulation and Methods of Amplitude Modulation, Power Relation in an AM Wave,. Identify modulating Amplifier Circuit: AM- Transmitter & Radio Receiver Essential Parameter, The AM generation of SSB, DSB-SC balanced modulators (Cowan & Ring), demodulation type of AM Signal: AM-Detector (Envelope & Synchronous) (30hr) Part C Frequency Modulation Process: Modulation Index, Deviation Ratio, Percent Modulation and FM Sidebands, the relationship between the modulation index and number of sidebands, generation of FM (the direct method and indirect method) & demodulation or detection, the comparison between AM and FM, FM

Receiver :FM Discriminator (Foster –Seeley &Ratio Detector), the Phase modulation (PM) Definition and the PM equation and PM wave forms.(24 hr)

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

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	MODULATION AND DEMODULATION: Forms of Amplitude Modulation , Methods of Amplitude Modulation
Week 2	Carrier Wave, Radio Frequency Spectrum, Sound, Radio Broadcasting
Week 3	Need for Modulation,
Week 4	Methods of Modulation:
Week 5	Amplitude Modulation Percent Modulation, Upper and Lower Sidebands,
Week 6	Mathematical Analysis of a Modulated Carrier Wave. Power Relation in an AM Wave,
Week 7	Midterm Exam
Week 8	Modulating Amplifier Circuit: AM- Transmitter

Week 9	Radio Receiver Essential Parameter
Week 10	Generation of SSB, DSB-SC Balanced Modulators :(Cowan & Ring) Demodulation of AM Signal: AM-Detector (Envelope & Synchronous
Week 11	Frequency Modulation: Modulation Index, Deviation Ratio , Percent Modulation, FM Side bands FM Receiver :FM Discriminator (Foster –Seeley & Ratio Detector),
Week 12	Modulation Index and Number of Side bands, Demodulation or Detection, Comparison between AM and FM, The Four Fields of FM
Week 13	FM Generation (Direct & Indirect Method)
Week 14	Phase modulation (PM) Definition
Week 15	PM equation and PM wave forms

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Methods of Modulation Process and why modulation
Week 2	Lab2: Demodulation methods Process and detection.
Week 3	Lab 3: Methods of Amplitude Modulation
Week 4	Lab4: Calculating the time and a frequency of carrier wave
Week 5	Lab 5: Calculating of Index Modulation AM and Percent Modulation.
Week 6	Lab 6: Calculating of Upper and Lower Side bands frequencies of AM
Week 7	Lab 7: Modulation AM wave.
Week 8	Lab 8: Calculating power content of AM
Week 9	Lab 9: DE-modulation wave of AM

Week 10	Lab 10:Frequency modulation Process
Week 11	Lab 11:Calculating the maximum and minimum frequency
Week 12	Lab 12: Calculating carrier frequency of FM
Week 13	Lab 13: Index Modulation and Percent Modulation of FM
Week 14	Lab 14: Modulation wave of FM
Week 15	Lab 15: De-Modulation wave of FM

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Principles of Communication Systems By J.S.Chitode, First Edition-2007 Modern Digital and Analog Communication Systems ,By B.P.Lathi OXFORD	Yes
Recommended Texts	Analog and Digital Communications, By Schaum Second Edition Data Communications and Networking, By Behrouz A. Forouzan, Fifth Edition	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Electronic Circuits		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET2205		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CET2104	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	70. This course deals with Third semiconductor or device, FET physical construction, biasing, configuration s , output and transfer characteristics 71. To understand the D.C biasing of BJT and circuit types , analysis and calculations of FET parameters 72. To understand and construct re FET modeling, and circuits analysis 73. To deal with small signal analysis of FET 74. Deals with Depletion-Type MOSFET , and Enhancement-Type MOSFETs and Combination ,and Design 6. Deals with Operational amplifiers (OP_AMP) their advantages, classifications and types and application circuits
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	127. To understand and discuss the third semiconductor device which is Transistor (Field Effect Transistor)(FET), Construction and Characteristics of JFETs 128. To Identify and Calculate And implement Transfer Characteristics of FET 129. To Identify and discuss Important Relationships 227 5.7 Depletion-Type MOSFET 228 5.8 Enhancement-Type MOSFET , MOSFET Handling , VMOS CMOS 130. To implement and solve FET DC biasing and circuits analysis Fixed-Bias Configuration Self-Bias Configuration Voltage-Divider Biasing, implementations 131. To understand Depletion-Type MOSFETs Enhancement-Type MOSFETs 132. To identify and implement Combination Networks , Design P-Channel FETs Universal JFET Bias Curve . 133. To understand FET small signal Model, 134. To Identify, Calculate and analyses JFET Fixed-Bias Configuration , JFET Self-Bias Configuration , JFET Voltage-Divider Configuration , 135. To understand JFET Source-Follower (Common-Drain) Configuration , JFET Common-Gate Configuration , 136. To identify Depletion-Type MOSFETs, Enhancement-Type MOSFETs E-MOSFET Drain-Feedback Configuration,

	137. To Understand and implement E-MOSFET Voltage-Divider Configuration, Designing FET Amplifier Networks. 138. To understand and identify Operational amplifiers (Introduction) , Differential and Common-Mode Operation 139. To understand Op-Amp, Practical Op-Amp Circuits , and Op-Amp Specifications 140. To identify DC Offset Parameters, Op-Amp Specifications and Frequency Parameters 141. To understand and identify OP AMP applications circuits. 142. To Analyze, calculate and implement Constant-Gain Multiplier, Voltage Summing , Voltage Buffer, Controller Sources Instrumentation Circuits ,and Active Filters
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. FET (Field Effect Transistor) (FET), Construction and Characteristics of JFETs, Transfer_Characteristics of FET , Important Relationships Depletion-Type MOSFET Enhancement-Type MOSFET , MOSFET Handling , VMOS CMOS [8hrs] . FET D.C. biasing and circuits analysis Fixed-Bias Configuration, Self-Bias Configuration , and Voltage-Divider Biasing, implementations [8 hrs] Depletion-Type MOSFETs Enhancement-Type MOSFETs, Combination Networks , Design, and P-Channel FETs Universal JFET Bias Curve [10hrs]. FET small signal Model, JFET Fixed-Bias Configuration , JFET Self-Bias Configuration , JFET Voltage-Divider Configuration [8hrs]. JFET Source-Follower (Common-Drain) Configuration , JFET Common-Gate Configuration , Depletion-Type MOSFETs , Enhancement-Type MOSFETs E-MOSFET Drain-Feedback Configuration, Voltage-Divider Configuration ,and Designing FET Amplifier Networks . [12hrs] 2. Operational amplifiers (OP_AMPS) Operational amplifiers (Introduction) , Differential and Common-Mode Operation Op-Amp introduction , Practical Op-Amp Circuits , and Op-Amp Specifications DC Offset Parameters , Op-Amp Specifications and Frequency Parameters [8 hrs] OP AMP applications circuits Constant-Gain Multiplier , Voltage Summing , Voltage Buffer, Controller Sources Instrumentation Circuits ,and Active Filters[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 type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10,	LO # 1-6 , LO # 6-11
	Assignments	2	10% (10)	5, 10	LO # 1-4, LO # 5-9
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1-12
	Midterm Exam	2 hr	10% (10)	9	LO #1-10

Summative assessment	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction ,Field effect transistor FET, Introduction , CONSTRUCTION AND CHARACTERISTICS
Week 2	TRANSFER CHARACTERISTICS, Applying Shockley's Equation, and short hand method
Week 3	DEPLETION-TYPE MOSFET, Basic Construction, c Operation and Characteristics
Week 4	p-Channel Depletion-Type MOSFET, ENHANCEMENT-TYPE MOSFET, Basic construction
Week 5	Enhancement MOSEFET Basic Operation and Characteristics, MOSFET HANDLING
Week 6	FET DC. Biasing , FIXED-BIAS CONFIGURATION,
Week 7	FET SELF-BIAS CONFIGURATION, VOLTAGE-DIVIDER BIASING
Week 8	DEPLETION-TYPE MOSFETs, ENHANCEMENT-TYPE MOSFETs. DESIGN
Week 9	Midterm Exam
Week 10	FET SMALL-SIGNAL MODEL, Graphical Determination of gm, Mathematical Definition of gm
Week 11	FET AC Equivalent Circuit, JFET VOLTAGE-DIVIDER CONFIGURATION, JFET SOURCE-FOLLOWER (COMMON-DRAIN) CONFIGURATION,
Week 12	JFET COMMON-GATE CONFIGURATION, DEPLETION-TYPE MOSFETs, ENHANCEMENT-TYPE MOSFETs
Week 13	Operational amplifier, DIFFERENTIAL AND COMMONMODE OPERATIO, OP-AMP BASICS

Week 14	Operational amplifier applications
Week 15	Operational amplifier applications
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction
Week 2	Lab 2: Clampers
Week 3	Lab 3 Input characteristic of CBC BJT
Week 4	Lab 4 output characteristic of CBC BJT
Week 5	Lab 5: Input characteristic of CEC BJT
Week 6	Lab 6: output characteristic of CEC BJT
Week 7	Lab 7:review

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electronic devices and circuit theory Poylested	Yes
Recommended Texts		No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors

	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Instrumentation and Measurement		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET2206		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	

Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	75. Identify and analyze factors affecting the performance of measuring systems and errors types and cause 76. Understand voltage and current measurements from a given circuit. 77. Choose appropriate instruments for the measurement of voltage, and current in ac and dc measurements 78. Describe the operating principle of DC and AC bridges 79. Identify Oscilloscopes, signal generators, and transducers
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	143. Explain the static characteristics of measuring systems. 144. Discuss problems related to measurement errors. 145. Explain the construction and working indicating Instruments. 146. Explain the principle of operation of the galvanometer. 147. Discuss the DC bridges- Wheatstone Bridge, Kelvin Bridge 148. Discuss the AC bridges, Capacitance Comparison Bridges, Maxwell's Bridge, Wein's bridge 149. Explain the Design of DC voltmeter and ammeter. 150. Describe Cathode Ray Tube Oscilloscope. 151. Identify High Bandwidth Digital Storage Oscilloscope. 152. Identify Spectrum Analyzer and BER Tester 153. Discuss Signal Generator. 154. Identify Arbitrary Waveform Generator

Indicative Contents المحتويات الإرشادية	155. Explain Transducers. Indicative content includes the following. <u>Part A – Measurement and Error Analysis</u> Basics of Measurements, Accuracy, Precision, Resolution, Gross errors and systematic errors, Absolute and relative errors, Accuracy, Precision, Resolution, and significant figures, standard of measurements [24 hrs.] <u>Part B – Measuring Instruments</u> Measurement of resistance, inductance, and capacitance Whetstone's Bridge, Kelvin Bridge; AC bridges, Capacitance Comparison Bridge, Maxwell's Bridge, Wein's Bridge, [9 hrs]. Voltmeters and Ammeters Introduction, voltmeter, Multirange voltmeter, ammeter, Multirange ammeter Extending voltmeter and ammeter ranges [11hrs] Introduction Oscilloscopes, Basic principles, CRT features, Block diagram and working of each block High Bandwidth Digital Storage Oscilloscope- Spectrum Analyzer -BER Tester [8 hrs] Introduction Signal Generators, Fixed and variable AF oscillator, Standard signal generator Arbitrary Waveform Generator. [4 hrs] Introduction Transducers, Electrical transducers, Selecting a transducer, Resistive transducer [2 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	lecture and seminars will be used to explain the theory and principles of the module. Also, laboratory reports and mini-projects will be used. Quantitative instruments such as pre-test and post-test will be used to check students' conceptual knowledge of electrical measurement after the theory lecture or laboratories work. Video will be used to explain the electrical measurement instruments. Observation form and laboratory rubric will be used to analyze the skills of the students. The observer comments from the laboratory staff on

student skills will be classified according to thematic analysis to evaluate students learned skills.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5)	3, 12	LO #1, 2, LO # 3-11
	Assignments	2	10% (5)	5, 10	LO # 1-4, LO # 5-9
	Project / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1- 12
Summative assessment	Midterm Exam	2 hr	10% (20)	9	LO # 1-7
	Final Exam	4 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction - System of Units- Basics of Measurements
Week 2	Accuracy, Precision, Resolution

Week 3	Reliability, Repeatability, Validity
Week 4	Types of Errors
Week 5	Errors analysis
Week 6	Standard of Measurements
Week 7	Bridge Measurement .DC bridges- Wheatstone Bridge, Kelvin Bridge
Week 8	AC bridges, Capacitance Comparison Bridges, Maxwell's Bridge, Wein's bridge
Week 9	Midterm Exam
Week 10	Measuring of Basic Electrical Parameters- DC Voltmeter
Week 11	DC Ammeter- Extension of DC Voltmeter and Ammeter Range
Week 12	Cathode Ray Tube Oscilloscope
Week 13	High Bandwidth Digital Storage Oscilloscope- Spectrum Analyzer -BER Tester
Week 14	Signal Generator - Arbitrary Waveform Generator
Week 15	Transducers

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Galvanometer – sensitivity of Galvanometer
Week 2	Lab 2: measurement of DC current
Week 3	Lab 3: measurement of DC voltage
Week 4	Lab 4: measurement of AC current
Week 5	Lab 5: measurement of AC Voltage
Week 6	Lab 6: loading effect on the voltmeter
Week 7	Lab 7: Wheatstone Bridge
Week 8	Lab 8: Maxwell's Bridge
Week 9	Lab 9: Mid-term Exam
Week 10	Lab 10: DC Voltmeter Design
Week 11	Lab 11: DC Ammeter Design
Week 12	Lab 12: Oscilloscope and frequency measurement
Week 13	Lab 13: Project Discussion

Week 14	Lab 14: A preparatory week before the Final Exam
Week 15	Lab 15: Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electronic Instrumentation and Measurements , David A Bell, PHI / Pearson Education.	Yes
Recommended Texts	“Principles of measurement systems” , John P. Beately, Pearson Education. Modern electronic instrumentation and measuring techniques” , Cooper D & A D Helfrick, PHI	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		معلومات المادة الدراسية	
Module Title	Arabic Language (2)	Module Delivery	
Module Type	Basic	☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MTU1009		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2		
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	maysaamahmood80@gmail.com
Peer Reviewer Name		e-mail	dr.ahmedjabbar@mtu.edu.iq
Scientific Committee Approval Date	15/10/2024	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	أهداف المادة الدراسية هي اني يكون الطالب قادراً على أن: 15. يتعرف على ماهية التعبير القرآني. 16. يتعلم القواعد النحوية المستعملة في التعبير القرآني، والأثر البلاغي والفني الذي يترتب على كيفية التعبير القرآني، وأن يفهم الطالب كيفية التحليل للنصوص القرآنية. 17. يتعرف على شخصية من أهم شخصيات الأدب والشعر العربي والعراقي، بدر شاكر السياب، ومعرفة شعره. 18. يتعرف على علامات الإعراب الأصلية والفرعية، ويتعلم استعمالها في اللغة العربية، ويفهم الفرق بين علامات الإعراب الفرعية والأصلية. 19. يتعلم الفرق بين الجمل الأسمية والفعلية، ويتعرف على أنواع المبتدأ، وأنواع الخبر، ويفهم الفرق بينهما. 20. يتعرف على إن وأخواتها، ويتعلم القواعد الخاصة بها. 21. يفهم الفرق بين إنَّ وأنَّ، وأنَّ وأنَّ، ويطبق ذلك عند استعمال كل منها في النصوص. 22. يتعرف على كان وأخواتها، ويتعلم عمل كل منها في اللغة، ويتمكن من استعمالها الصحيح في اللغة. 23. يتعرف على عمل الأفعال الخمسة، وعلامات إعرابها، ويستطيع استعمالها بشكل صحيح في الخطاب، أو النص. 24. يتعرف على الأخطاء اللغوية، ويتعلم تجنبها أثناء الكتابة. 25. يدرس معلومات لغوية: الأضداد والمرادفات، والفرق اللغوية، والمعاملات النحوية، ويفهم الفرق بينها، ويتمكن من تحليلها. 26. يتعلم إعراب المثنى. 27. يتعرف على أنواع الجموع، ويتعلم التفريق بينها، ويفهم كيفية إعرابها. 28. يتعلم كيفية كتابة قواعد اللغة العربية في لوحة بيانية، ويتمكن من تصويب الأخطاء اللغوية.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	مخرجات التعلم للمادة الدراسية هي: 14. قدرة الطالب على فهم التعبير القرآني، وتحليل النصوص. 15. القدرة على استخدام القواعد النحوية، وفهم الأساليب البلاغية والقدرة على استعمالها. 16. معرفة الطالب لشخصية الشاعر والأديب بدر شاكر السياب، وأهم أشعاره وآثاره. 17. القدرة على التمييز بين علامات الإعراب الأصلية والفرعية، والقدرة على استعمالها في الخطاب، أو النص. 18. قدرة الطالب على التمييز بين الجمل الأسمية والفعلية، وقدرته على التمييز بين أنواع المبتدأ، والخبر، وكيفية استعمال الجمل وإعرابها. 19. فهم الطالب لعمل إنَّ وأخواتها، وقدرته على استعمالها بشكل صحيح في الجمل. 20. القدرة على التفريق بين أنَّ وإنَّ، وإنَّ وأنَّ، واستعمالها في مواضعها الصحيحة في النصوص. 21. القدرة على فهم عمل كان وأخواتها، واستعمالها بشكل صحيح. 22. التمكن من معرفة وأعراب الأفعال الخمسة، وكيفية استعمالها في الجمل. 23. القدرة على معرفة وتجنب الأخطاء اللغوية عند الكتابة. 24. معرفة إعراب المثنى. 25. القدرة على التمييز بين الجموع، وكيفية إعرابها، واستعمالها في الجمل. 26. معرفة الطالب لمعلومات لغوية: المرادفات. والأضداد، والفرق اللغوية، والمعادلات النحوية، والقدرة على استخراجها، أو استعمالها في الجمل.
Indicative Contents	المحتويات الإرشادية في مادة اللغة تشمل مجموعة من المفاهيم والمواضيع التي يتم تغطيتها خلال عملية التعلم. ومن بين المحتويات الإرشادية المهمة:

المحتويات الإرشادية	13. مقدمة عن التعبير القرآني، وتعريف بالإعجاز اللغوي في آيات القرآن الكريم وجمالية اللغة العربية وبلاغتها. (4 ساعات) 14. التعريف بشخصية الشاعر الكبير بدر شاكر السياب ، وأهمية شعره في الأدب العربي والعراقي. (4 ساعات) 15. دراسة علامات الإعراب ، بنوعيتها ، وكيفية الأعراب . (4 ساعات) 16. دراسة الجمل الأسمية والفعلية ، وتعلم التفريق بين الأنواع المبتدأ ، وأنواع الخبر. (4 ساعات) 17. دراسة إن وأخواتها ، وكيفية عملها وأعرابها . (4 ساعات) 18. دراسة الفرق بين إنَّ وأنَّ، وإنَّ وأنَّ، وكيفية عملها وأعرابها. (4 ساعات) 19. دراسة كان وأخواتها ، وكيفية عملها وإعرابها. (4 ساعات) 20. التعريف بالأفعال الخمسة ، وعملها وإعرابها. (4 ساعات) 21. دراسة الأخطاء اللغوية الشائعة وتطبيقاتها في النصوص. (4 ساعات) 22. تعلم المعلومات اللغوية : الأضداد والمترادفات، والفروق اللغوية ، والمعادلات النحوية. (3 ساعات) 23. دراسة المثنى وأعرابه. (٣ساعات) 24. دراسة الجموع ، وأنواعها وإعرابها. (٣ ساعات) 25. دراسة القواعد النحوية وكتابتها في رسم بياني ، وتصويب الأخطاء اللغوية. (3 ساعات)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم

Strategies	استراتيجيات التعلم والتعليم المستخدمة في مادة اللغة تشمل مجموعة متنوعة من النهج والتقنيات التي تعزز عملية التعلم للطلاب. من بين هذه الاستراتيجيات: 9. التفاعل النشط: يتم تشجيع الطلاب على المشاركة والمشاركة الفعالة في الدروس من خلال المناقشات الجماعية والأنشطة التفاعلية. 10. التعلم التعاوني: يشجع التعاون والتعاون بين الطلاب من خلال العمل الجماعي والمشاريع الجماعية، حيث يتعاون الطلاب مع بعضهم البعض لتحقيق أهداف التعلم المحددة. 11. التطبيق العملي: يتم توفير فرص للطلاب لتطبيق المفاهيم والمهارات المكتسبة في سياقات عملية وواقعية، مما يعزز التفاعل الفعال مع المادة. 12. استخدام التقنيات الحديثة: يستفيد الطلاب من استخدام التكنولوجيا في عملية التعلم، مثل استخدام الحواسيب والإنترنت للبحث والتعلم الذاتي. 13. توفير ردود فعل فورية: يتم توفير ردود فعل فورية وتقييم مستمر للطلاب، سواء عن طريق التقييمات الشفهية أو الكتابية، مما يساعدهم على تحسين أدائهم وتطوير مهاراتهم. 14. التنوع في وسائل التواصل: يتم استخدام مجموعة متنوعة من وسائل التواصل والتعليم، مثل المحاضرات التوضيحية، والمناقشات الجماعية، والأنشطة العملية، والعروض التقديمية، لتلبية احتياجات وأساليب التعلم المختلفة للطلاب. 15. باستخدام هذه الاستراتيجيات، يتم تعزيز التفاعل والتعلم الفعال للطلاب، و تحفيزهم على المشاركة واكتساب المعرفة والمهارات بشكل شامل وشيق. 16.
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Student Workload (SWL) الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعا

Structured SWL (h/sem)	33	Structured SWL (h/w)	2
الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1
الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem)			50
الحمل الدراسي الكلي للطلاب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

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

المنهاج الاسبوعي النظري

Delivery Plan (Weekly Syllabus)

التعبير القرآني، نحويًا من حيث تركيب الجملة والنص. بلاغيا من حيث التأثير الفني، والرجوع إلى المصدر (كتاب التعبير القرآني) للدكتور فاضل السامرائي .	الأسبوع الأول ، والثاني
الشاعر بدر شاكر السياب.	الاسبوع الثالث
علامات الإعراب الأصلية: (الفتحة والضمة، والكسرة)، وعلامات الإعراب الفرعية : (الألف ، والواو، والياء).	الأسبوع الرابع
الجملة الاسمية – المبتدأ والخبر ، وأنواع المبتدأ ، وأنواع الخبر.	الأسبوع الخامس
أَنَّ وأخواتها	الأسبوع السادس
الفرق بين إِنَّ وَأَنَّ ، وَأَنْ وَأُنْ.	الأسبوع السابع
كان وأخواتها.	الأسبوع الثامن
الأفعال الخمسة .	الأسبوع التاسع والعاشر
الأخطاء اللغوية الجزء (2)	الاسبوع الحادي عشر
معلومات لغوية : المرادفات والاضداد، وفروق لغوية. ومعادلات نحوية.	الاسبوع الثاني عشر
المثنى وإعرابه.	الأسبوع الثالث عشر والرابع عشر
أنواع الجموع : جمع المذكر السالم- جمع المؤنث السالم- جمع التذكير .	الأسبوع الخامس عشر
هندسة النحو: قواعد اللغة العربية في لوحة تعليمية ، وتصويبات لغوية	الأسبوع السادس عشر

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• ملزمة اللغة العربية (المعممة من وزارة التعليم العالي والبحث العلمي)	Yes
Recommended Texts	• التعبير القرآني للدكتور فاضل السامرائي.	No
Websites	The Collage E-Library	

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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية						
Module Title	Operating Systems		Module Delivery			
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar			
Module Code	CET3101					
ECTS Credits	5					
SWL (hr/sem)	125					
Module Level	3	Semester of Delivery		5		
Administering Department	CET	College	EETC			
Module Leader			e-mail			

Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	1. This course includes the basic concepts of operating system components. 2. To develop problem-solving skills and understand process management, deadlocks, and synchronization. 3. To understand consists of memory management techniques. 4. This course deals with File system implementation. 5. It also includes a case study on the Linux operating system. 6. To understand the I/O device management principles. 7. To perform the disk Structure, Disk Scheduling (FCFS, SSTF, SCAN, CSCAN, LOOK, CLOOK), and Disk Formatting.
Module Learning Outcomes	156. Should understand: hardware components that must be managed by an operating system. 157. Describe need and role of operating system. 158. The concept of a process, the process life cycle, process states and state transitions, process control blocks (PCBs)/process

مخرجات التعلم للمادة الدراسية

descriptors.

159. How processors transition between processes via context switching. How interrupts enable hardware to communicate with software. How processes converse with one another via interprocess communication (IPC).
160. The motivation for creating threads. The similarities and differences between processes and threads. The various levels of support for threads. The life cycle of a thread. Thread signaling and cancellation.
161. The challenges of synchronizing concurrent processes and threads. Critical sections and the need for mutual exclusion. how to implement mutual exclusion primitives in software
162. How monitors synchronize access to data. How condition variables are used with monitors. Solutions for classic problems in concurrent programming such as readers and writers and circular buffer.
163. The problem of deadlock. The four necessary conditions for deadlock to exist. The problem of indefinite postponement. The notions of deadlock prevention, avoidance, detection and recovery.
164. Understand OS components such a scheduler, memory manager, file
165. System handlers and I/O device managers.
166. Analyze and criticize techniques used in OS components
167. Demonstrate and simulate algorithms used in OS components
168. Identify algorithms and techniques used in different components of Linux

Indicative Contents

المحتويات الإرشادية

- 1. Operating System Overview teaching hours: 10 hrs**
- 2. Process Management teaching hours: 10 hrs**
- 3. Process Deadlocks teaching hours: 10 hrs**
- 4. Memory Management teaching hours: 14 hrs**
- 5. File Management teaching hours: 10 hrs**
- 6. Device Management teaching hours: 10 hrs**
- 7. Linux Case Study teaching hours: 10 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 An operating system that acts as an intermediary between the user of a computer and the computer hardware. The purpose of an operating system is to provide an environment in which a user can execute programs in a convenient and efficient manner.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Operating Systems Operating System Architectures, Definition, Two views of operating system, Evolution of operating system, Types of OS
Week 2	System Call, Handling System Calls, System Programs, Operating System Structures, The Shell, Open Source Operating Systems
Week 3	Process vs Program, Multiprogramming, Process Model, Process States, Process Control Block. Threads, Thread vs Process, User and Kernel Space Threads. Inter Process Communication, Race Condition, Critical Section
Week 4	Implementing Mutual Exclusion: Mutual Exclusion with Busy Waiting (Disabling Interrupts, Lock Variables, Strict Alteration, Peterson's Solution, Test and Set Lock), Sleep and Wakeup, Semaphore, Monitors, Message Passing, Classical IPC problems: Producer Consumer, Sleeping Barber, Dining Philosopher Problem.
Week 5	Process Scheduling: Goals, Batch System Scheduling (First-Come First-Served, Shortest Job First, Shortest Remaining Time Next), Interactive System Scheduling (Round-Robin Scheduling, Priority Scheduling, Multiple Queues), Overview of Real Time System Scheduling.
Week 6	Introduction, Deadlock Characterization, Preemptable and Non-preemptable Resources, Resource – Allocation Graph, Conditions for Deadlock.
Week 7	Midterm Exam
Week 8	Handling Deadlocks: Ostrich Algorithm, Deadlock prevention, Deadlock Avoidance, Deadlock Detection (For Single and Multiple Resource Instances), Recovery From Deadlock (Through Preemption and Rollback. Introduction, Monoprogramming vs. Multi-programming, Modelling Multiprogramming, Multiprogramming with fixed and variable partitions, Relocation and Protection. Memory management (Bitmaps & Linked-list), Memory Allocation Strategies.
Week 9	Virtual memory: Paging, Page Table, Page Table Structure, Handling Page Faults, TLB's Page Replacement Algorithms: FIFO, Second Chance, LRU, Optimal, LFU, Clock, WS- Clock,
Week 10	Concept of Segmentation: Need of Segmentation, its Drawbacks, Segmentation with Paging(MULTICS).

Week 11	File Overview: File Naming, File Structure, File Types, File Access, File Attributes, File Operations, Single Level, two Level and Hierarchical Directory Systems, File System Layout.
Week 12	Implementing Files: Contiguous allocation, Linked List Allocation, Linked List Allocation using Table in Memory, Inodes. Directory Operations, Path Names, Directory Implementation, Shared Files
Week 13	Free Space Management: Bitmaps, Linked List
Week 14	Classification of IO devices, Controllers, Memory Mapped IO, DMA Operation, Interrupts, Goals of IO Software, Handling IO(Programmed IO, Interrupt Driven IO, IO using DMA), IO Software Layers (Interrupt Handlers, Device Drivers) . Disk Structure, Disk Scheduling (FCFS, SSTF, SCAN, CSCAN, LOOK, CLOOK), Disk Formatting (Cylinder Skew, Interleaving, Error handling), RAID.
Week 15	History, Kernel Modules, Process Management, Scheduling, Inter-process Communication, Memory Management, File System Management Approaches, Device Management Approaches.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Demonstration of basic Linux Commands
Week 2	Lab 2: Process creation and termination, thread creation and termination
Week 3	Lab 3: Simulation of IPC techniques
Week 4	Lab 4: Simulation process Scheduling algorithms
Week 5	Lab 5: Simulation of page replacement algorithms
Week 6	Lab 6: Simulation of File allocation techniques
Week 7	Lab 7: Simulate free space management techniques
Week 8	Lab 8: Simulation of disk scheduling algorithms

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Operating Systems (3rd Edition) 3rd Edition	Yes

	by Harvey M. Deitel (Author), Paul J. Deitel (Author), David R. Choffnes (Author)	
Recommended Texts	Operating System Concepts Essentials Tenth Edition Avi Silberschatz Peter Baer Galvin Greg Gagne	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Control Engineering Fundamentals		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET3102			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	3	Semester of Delivery	5	
Administering Department	CET	College	EETC	
Module Leader			e-mail	
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	80. To define the control systems. 81. To develop mathematical models that accurately represent the behavior of the system
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	82. To simplify the representation of a control system. 83. To examine the system's behavior during the transient period and the steady state. 84. To design controllers that can manipulate the system or process to achieve desired objectives.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	169. Define the control system. 170. classify the different types of control systems. 171. Describe a physical system in terms of differential equations 172. Use Laplace Transform in solving differential equations of the Control System. 173. Derive Transfer Function for describing the work of servomotors. 174. Reduce a block diagram of multiple subsystems to a single block representing the Transfer Function of the system. 175. Understand steady state and transient time response analysis. 176. Find error Coefficients and steady-state error (e_{ss}) according to system type. 177. Find the time response of the 1st order system. 178. Find the time response of the 2nd order system. 179. Understand the effect of damping ratio ξ on 2nd order system. 180. Identify Transient response specifications. 181. Define PID controllers. 182. Reduce the effect of Steady-state error (e_{ss}) and settling time (T_s) on time response using PID controller.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A – Basics of Control Systems and Transfer Function</u> Control System definitions, Classification of Control Systems, Comparison of Open Loop and Closed Loop Control Systems, Use Laplace Transform in Control System, Mathematical Modelling of Control Systems: Electrical Systems and Mechanical Systems (Translational and Rotational), Servomotors, Rules of Block diagram reduction. [24 hrs] <u>Part B – Time Response Analysis of Control Systems</u>

	Definitions: time response, transient response and steady state response, standard test inputs, steady state analysis, static error coefficient method, analysis of type 0,1 and 2 systems, transient response analysis: 1st order and 2nd order systems. [30 hrs] PID controllers: PD controller, PI controller, PID controller and output derivative controller [20 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module focuses on fostering active student engagement during exercises, fostering the development of critical thinking skills, and encouraging participation. This will be accomplished through a combination of classroom instruction, interactive tutorials, and the inclusion of engaging experiments that involve sampling activities that capture students' interest. The aim is to refine and enhance students' critical thinking abilities while ensuring their active involvement in the learning process.

Student Workload (SWL) الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – Basics of Control Systems
Week 2	Use of Laplace Transform in Control System
Week 3	Mathematical Modelling of Control System: Electrical System
Week 4	Mathematical Modelling of Control System: Translational Mechanical System
Week 5	Mathematical Modelling of Control System: Rotational Mechanical System
Week 6	Servomotors
Week 7	Block Diagram Reduction
Week 8	Mid-term Exam
Week 9	Time Response Analysis of Control Systems
Week 10	Analysis of Type 0, 1, and 2 systems
Week 11	Transient Response Analysis
Week 12	Analysis of 2 nd order system
Week 13	Transient response specifications
Week 14	PID controllers
Week 15	Rate feedback controller

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to MATLAB Simulink
Week 2	Lab 2: Laplace Transform / Verifying Algebraic functions
Week 3	Lab 3: Laplace Transform / Verifying Sine functions
Week 4	Lab 4: Block Diagram Reduction
Week 5	Lab 5: Steady State Error
Week 6	Lab 6: 1 st Order System
Week 7	Lab 7: 2 nd Order System
Week 8	Lab 8: Proportional Controller/ P Controller Used in Closed-Loop DC Servo Motor Speed Control System
Week 9	Lab 9: Proportional Controller/ P Controller Used in Closed-Loop DC Servo Motor Position Control System
Week 10	Lab 10: Integral Controller/ I Controller Used in Closed-Loop DC Servo Motor Speed Control System
Week 11	Lab 11: Integral Controller/ I Controller Used in Closed-Loop DC Servo Motor Position Control System
Week 12	Lab 12: Derivative Controller/ D Controller Used in Closed-Loop DC Servo Motor Speed Control System
Week 13	Lab 13: Derivative Controller/ D Controller Used in Closed-Loop DC Servo Motor Position Control System
Week 14 & 15	Lab 14: PID Controller

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
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Required Texts	Modern Control Engineering, K. Ogata, 2010 Pearson Education	Yes
Recommended Texts	1 . Control Systems Engineering, U.A. Bakshi and S.C. Goyal, 2007 Technical Publications. 2 . Modern Control Systems, R. Dorf and R. Bishop, 2011 Pearson Education	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
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Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Digital Signal Processing	Module Delivery	
Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET3103		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	5
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims	
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أهداف المادة الدراسية	85. Demonstrate an understanding of basic discrete-time systems, linearity, time-invariance, stability, impulse response and discrete convolution. 86. Implement discrete time systems, recursive and nonrecursive realizations. 87. Perform Z transform and finding the inverse Z transform including its properties. 88. Demonstrate an understanding of frequency analysis of both continuous and discrete signals. 89. Demonstrate an understanding of frequency response of linear time invariant systems. 90. Demonstrate an understanding of discrete Fourier transform, its properties and applications. 91. Design FIR and IIR digital filters.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. State, prove and apply Shannon's sampling theorem 2. Relate signal to noise ratio (SNR) to number of samples averaged in signal sampling and averaging systems 3. Implement sampling of continuous time signals and reconstruct them from their samples by choosing appropriate parameters and functions. 4. Change the sampling rate of discrete-time signals, avoiding folding effects. 5. Describe the fundamental properties of linear time invariant systems. 6. Analyze signals and systems in the discrete time domain. 7. Compute the frequency response of linear and time-invariant discrete-time systems, implement decomposition into a minimum-phase system and an all-pass system, and describe generalized linear-phase systems. 8. Implement discrete-time systems using various structures. 9. Understand the importance of the discrete Fourier transform and algorithms for its fast computation. 10. Analyze discrete-time signals in the frequency domain, using the windowing method as well as the time-dependent discrete Fourier transform, and reconstruct the signal with the overlap-sum algorithm. 11. Write down, state the properties of, and apply Fourier Transforms in DSP systems 12. Analyze and implement systems in the field of Z transformation. 13. Design basic finite impulse response (FIR) and infinite impulse response (IIR) filters.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Introduction to DSP</u> Introduction to DSP, discrete signals and their properties. In addition, the concept of frequency in continuous time and discrete time signals. [5 hrs] <u>Discrete systems</u> Discrete systems, linear time-invariant systems, convolution theorem; Digital Signal Processing (DSP) is concerned with the processing of signals that are represented as sequences of finite-precision numbers. [10 hrs] <u>Sampling and reconstruction of analogue signals</u> Review of continuous-time signal and system analysis using Fourier ; Ideal impulse sampling and reconstruction of bandlimited signals; digital to analogue conversion, and practical considerations. [10 hrs] <u>Discrete-time sequences</u> Discrete-time signals and systems, linearity, time-invariance, stability, causality; discrete-time convolution, linear constant-coefficient difference equations, magnitude and phase response. [5 hrs] <u>The Discrete Fourier Transform</u> The discrete Fourier transform (DFT); properties of the DFT; circular convolution; linear convolution via the DFT and the overlap-add method; the radix-2 decimation-in-time fast Fourier transform (FFT) algorithm. [10 hrs] <u>The z-transform and its properties</u> The z-transform, region of convergence for the z-transform, inverse z-transform, z-transform properties. [10 hrs] <u>FIR filter design</u>
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	Generalized linear-phase causal FIR filters; FIR linear-phase filter design using the window method; frequency-sampling design of FIR filters. [10 hrs] <u>IIR filter design</u> IIR filter design using the bilinear transformation; Filter design by impulse invariance response. [10 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module focuses on fostering active student engagement during exercises, fostering the development of critical thinking skills, and encouraging participation. This will be accomplished through a combination of classroom instruction, interactive tutorials, and the inclusion of engaging experiments that involve sampling activities that capture students' interest. The aim is to refine and enhance students' critical thinking abilities while ensuring their active involvement in the learning process.

Student Workload (SWL) الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1-4 , LO #4-9
	Assignments	2	10% (10)	3, 12	LO # 1,2, LO #3-11
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1-11
Summative assessment	Midterm Exam	2 hr	10% (10)	6	LO # 1-5
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		
Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري					
	Material Covered				
Week 1	Signals, Systems and signal processing Basic element of digital signal processing, Advantages of digital over analog signal processing, Classification of Signals				
Week 2	The Concept of frequency in Continuous and Discrete – time signals Continuous – time sinusoidal signals, Discrete – time sinusoidal signals, Harmonically related complex exponential.				
Week 3	Analog –to-digital and digital-to-analog conversions Sampling of analog signals, The sampling theorem, Quantization and conversion, Digital-to-analog conversion, Analog-to-digital conversion.				
Week 4	Analysis of digital signals and systems.				
Week 5	Convolution in discrete time systems				
Week 6	Mid-term Exam				
Week 7	DE convolution in discrete time systems				
Week 8	Discrete-time systems Input/output description of systems, Block diagram representation of discrete-time systems, Classification of discrete-time system, Correlation of discrete-time signals, Properties of correlation.				
Week 9	Time domain to frequency domain conversion Discrete-Fourier transform				
Week 10	Fast-Fourier transform				
Week 11	The Z-transform				

	Direct Z-transform
Week 12	Inverse Z-transform, Properties of the Z-transform.
Week 13	Analogue Filtering versus Digital filtering
Week 14	Design methods of FIR Filters
Week 15	Design Methods of IIR Filters

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Discrete and Continuous-Time Signals.
Week 2	Lab 2: Discrete-Time Systems.
Week 3	Lab 3: Frequency Analysis.
Week 4	Lab 4: Sampling and Reconstruction.
Week 5	Lab 5: Discrete Fourier Transform.
Week 6	Lab 6: The Z-transform.
Week 7	Lab 7: Digital Filter Design.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Digital Signal Processing by John Proakis & D. G. Manolakis, 4/E. Pearson, 2006.	Yes
Recommended Texts	Sanjit K. Mitra, "Digital Signal Processing – A Computer Based Approach", Tata Mc Graw Hill, 2007.	No
Websites	https://www.youtube.com/watch?v=6dFnpz_AEyA&list=PL9567DFCA3A66F299	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Digital Controllers	Module Delivery
Module Type	Core	☒ Theory ☐ Lecture
Module Code	CET3104	

ECTS Credits	5	☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	5
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	1. To know the types of microcontrollers and its architecture 2. To understand the difference between the microcontroller and microprocessor 3. dealing with the internal parts of microcontrollers 4. programming the PIC microcontrollers 5. connect the microcontrollers with peripherals to input and output the information 6. Implement interrupts in programs
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	7. Programming the PIC with the peripherals devices
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	14. Recognize how integrated circuits and microcontrollers works. 15. Known the advantages of using Microcontrollers and Microprocessors. 16. Summarize what is meant by a Peripheral Interface Controller. 17. Describe the PIC Microcontroller. 18. Known type and function of register and SFR in Microcontroller. 19. Explain the A/D (Analog-to-Digital) Converter. 20. Discuss Capture, Compare, and Pulse width modulation modules in PIC microcontrollers. 21. Define and implement interrupts in programs. 22. Explain serial communication systems. 23. Identify how the Oscillator works in an electric circuit. 24. Programming the microcontroller, outputting data/signals, reading data/signals, and character LCD. 25. Application projects of microcontrollers.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. --Introduction to Introduction to Microcontrollers, Integrated Circuits, General Organization of PIC Microcontrollers: Pins Properties, Registers & Special Function registers, Ports (Input / Output), and Power Supply. Microcontroller Pins Features. The memory unit (ROM, Masked ROM, OTP ROM, UV EPROM, and EEPROM Memory). RAM memory and Flash memory. [15 hrs] --Central Processor Unit (CPU). Interrupt (example of interrupt in a microcontroller). Arithmetical Logical Unit (ALU). Instruction Decoder. Accumulator. Bus (Address Bus and Data Bus). [10 hrs] --Serial Communication, Baud rate, I2C Protocol, SPI (Serial Peripheral Interface), and UART (Universal Asynchronous Receiver/Transmitter) [15 hrs] --Oscillator. Timers, using interrupt in timer operating, Watchdog Timer. Counters [10 hrs] --Revision problem classes [5 hrs]

--A/D (Analog-to-Digital) Converter, procedure takes place in the A/D converter module, overall plan of ADC, ADRESH, and ADRESL Registers, A/D Acquisition Requirements , ADCON0 Register & ADCON1 Register, Reference Volts. CCP Modules (Capture, Compare, and Pulse width modulation in PIC microcontrollers [19 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 learning and developing their skills in microcontrollers and logic thinking, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering the type of lab experiments involving assignments and project design activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the microcontroller, the difference between MP and Microcontroller
Week 2	The architecture of PIC Microcontroller
Week 3	General Organization of PIC, Registers & Special Function registers
Week 4	Memory Units and CPU
Week 5	I/O ports of the Microcontroller
Week 6	Serial communication, Oscillator, and Timer/Counters
Week 7	Baud rate
Week 8	Programming the Microcontroller
Week 9	Midterm Exam
Week 10	outputting data/signals, Reading data/signals , Character LCD
Week 11	A/D converter & Analog Module
Week 12	On-Chip CCP (Capture, Compare & PWM)
Week 13	Microcontroller Interrupts Programming
Week 14	EEPROM Programming
Week 15	Application projects of Microcontroller

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

Material Covered

Week 1	Lab 1: Introduction to Micro C with a simple program
Week 2	Lab 2: Counter and Flash LED
Week 3	Lab 3: program using Micro C to count from increasing and decreasing
Week 4	Lab 4: Seven Segment
Week 5	Lab 5: LCD & Switch
Week 6	Lab 6: program using Micro C to input analog signal and read data
Week 7	Lab 7: EEPROM to read and write data.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	PIC Microcontrollers: An Introduction to Microelectronics, Martin P. Bates. Teach Yourself PIC Microcontrollers, M. Amer Iqbal Qureshi	Yes
Recommended Texts	Interfacing PIC Microcontrollers to Peripheral Devices:2011,	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Digital Communications		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET3105			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	3	Semester of Delivery		5
Administering Department	CET	College	EETC	
Module Leader			e-mail	
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	

Scientific Committee Approval Date	29/10/2023	Version Number	1.0
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Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The aims to students in third stage to defined and understand the -Concepts and terminology used in digital communications -The advantage and disadvantage of each type of digital communication systems -Types of Digital modulation - Send multiple digital signals at the same time and how to retrieve it
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Describe of concepts and terminology used in digital communications 2 -Explain the advantage and disadvantage of each type of digital communications systems 3- Identify types of digital modulation 4- Discuss the comparison between the types of digital systems and its

	advantages 5- work on digital systems and Describe the most suitable designs 6- Explain how can send more than a signal at the same time and how to retrieve it 7- analog signal into a digital signal converter (PCM) 8- Explain types of digital modulation ask , psk , fsk 9- Explain the modulation and demodulation of quadrature amplitude modulation
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - Introduction to digital communication & Sampling theorem (10 hr) - Pulse Amplitude Modulation (PAM), Pulse width and Pulse Position (10 hr) - Source Coding Techniques Modulation (24 hr) - Baseband modulation (Digital Modulation), (30 hr)
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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Signal types, General block diagram of digital communication
Week 2	Advantage and disadvantage of digital modulation, digital coding
Week 3	Sampling theorem, Pulse Amplitude Modulation (PAM),
Week 4,5	Pulse width and Pulse Position Modulation (PWM & PPM),
Week 6	Time Division Multiplexing (TDM) , Pulse Code Modulation PCM),
Week 7	Mid exam
Week 8	Noise Consideration in PCM, Limitation and Modifications of PCM
Week 9	Differential PCM (DPCM), Delta Modulation (DM),
Week 10	Delta-Sigma Modulation
Week 11	Baseband modulation (Digital Modulation)
Week 12	Amplitude Shift Keying (ASK) [Modulation and demodulation].

Week 13	Frequency Shift Keying (FSK) [Modulation and demodulation],
Week 14	Phase Shift Keying (PSK) [Modulation, Coherent and Noncoherent Detection], Differential PSK.
Week 15	Quadrature Phase Shift Keying (QPSK)

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Fourier series and Fourier Transform , Spectrum analysis of signal
Week 2	Pulse Amplitude Modulation
Week 3	Pulse Position Modulation (PPM)
Week 4	Pulse Code Modulation
Week 5	Digital Time Division Multiplexing (TDM)
Week 6	Delta Modulation (DM)
Week 7	Amplitude shift key (ASK)
Week 8	Phase Shift Key (PSK)
Week 9	Frequency Shift Key (FSK)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Sarkar N., Elements of Digital Communications, first edition, 2003	NO
Recommended Texts	- Haykin S., Introduction to Analog and Digital Communications, second edition, 2007.	No
Websites	https://www.coursera.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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	RealTime Systems	Module Delivery ☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Type	E	
Module Code	CET3106	
ECTS Credits	5	
SWL (hr/sem)	125	

Module Level	3	Semester of Delivery	5
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	1. To teach the students about Real-time scheduling and schedulable analysis. 2. To enable the students to Formally specify and verify the timing constraints 3. Design methods for real-time systems 4. Development and implementation of new techniques to advance the state-of-the-art real-time systems research.
Module Learning Outcomes	• correctly and precisely reason about times, events, and action

مخرجات التعلم للمادة الدراسية	• list and reason about the sources of error and inexactitude in time interval measurement, execution time prediction, and scheduling • empirically estimate the accuracy of a real time clock • measure the execution time of a piece of code • empirically estimate the accuracy and overhead of a real-time scheduler • describe and apply commonly used abstract models and terminology for real-time scheduling and resource management • recognize, classify, and formulate the hard and soft timing requirements of a software system • select an appropriate software architecture and combination of scheduling techniques to satisfy a set of timing requirements • understand and apply the proofs of the fundamental theorems of deadline and fixed priority real-time scheduling • carry out schedulability analysis using deadline and fixed-priority approaches • implement a set of tasks with periodic and aperiodic timing requirements, using C threads and a real-time variant of the Linux operating system • evaluate the suitability of an operating system for real-time applications
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part-A [20 Hrs] Introduction to RTS: what is system, what is RT, what is the concept of time in systems, classification, specs of each type, how and when, Part-B [20Hrs] Scheduling: the concept of scheduling, types, clock, priority, aperiodic, sporadic tasks, resource access, resource control Part-C [20 Hrs] Multi-processor scheduling: coordination, resource sharing, temporal constraints. Part-D [10 hrs] RTOS, Datastores, timers, kernels

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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module focuses on fostering active student engagement during exercises, fostering the development of critical thinking skills, and encouraging participation. This will be accomplished through a combination of classroom instruction, interactive tutorials, and the inclusion of engaging experiments that involve sampling activities that capture students' interest. The aim is to refine and enhance students' critical thinking abilities while ensuring their active involvement in the learning process.

Student Workload (SWL) الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.26
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	6, 10	LO #1-5, LO #5-9
	Assignments	2	10% (10)	8, 13	LO #1-6, LO #6- 10
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	14	LO # 1- 12

Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-6
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to RTs
Week 2	Hard Versus Soft Real-Time Systems
Week 3	A Reference Model of Real-Time Systems
Week 4	Commonly Used Approaches to Hard Real-Time Scheduling
Week 5	Clock-Driven Scheduling
Week 6	Priority-Driven Scheduling of Periodic Tasks
Week 7	Midterm Exam
Week 8	Scheduling Aperiodic and Sporadic Jobs in Priority-Driven Systems. Resources and Resource Access Control
Week 9	Clock sync, timers, Kernels
Week 10	RT in distributed Systems
Week 11	Scheduling in multi-processors
Week 12	Clock Sync.
Week 13	Hardware, timers, Kernels
Week 14	RTOS
Week 15	Real Time data stores

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Arduino UC

Week 2	Static loops
Week 3	Dynamic loops
Week 4	Watchdog
Week 5	Timers
Week 6	Arduino RTOS
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	Network app (client)
Week 12	Network app (server)
Week 13	Network app (UDP)
Week 14 & 15	Proto-typing

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Real-Time Systems, Jane W. S. Liu, 2000	NO
Supporting Texts		No
Online resource	https://www.youtube.com/watch?v=yShUSwskUNA&list=PL1iLu2CSC9EU4mMByEhBp9CcYgAliDs_v https://personal.utdallas.edu/~cxl137330/courses/fall13/RTS/RTS.html http://www.cs.fsu.edu/~baker/realtime/syllabus.html#Objectives	

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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Parallel Computing	Module Delivery
Module Type	Elective	☒ Theory ☐ Lecture ☒ Lab
Module Code	CET3107	
ECTS Credits	5	
SWL (hr/sem)	125	

		☐ Tutorial ☐ Practical ☐ Seminar	
Module Level	3	Semester of Delivery	5
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	1. To understand the basic principles of parallel computing. 2. To demonstrate different types of parallel algorithms 3. To deal with the basic concept of parallel programming.
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	- To evaluate the performance of the parallel programs. - To apply parallel programming for solving different problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Understand the fundamental concepts of parallel computing and its importance in modern computing systems. - Demonstrate knowledge of different parallel computing architectures and their characteristics. - Develop an understanding of parallel algorithms for specific computational tasks, such as sorting or graph algorithms. - Demonstrate proficiency in using parallel computing libraries and tools, such as OpenMP or MPI. - Analyze and evaluate the performance of parallel algorithms and programs. - Design and implement parallel algorithms using parallel programming models and frameworks. - Identify and overcome common challenges in parallel computing, such as load balancing and synchronization. - Utilize parallel computing techniques to solve computationally intensive problems efficiently. - Apply parallelization strategies to different types of applications, such as numerical simulations or data processing tasks. - Optimize parallel programs through techniques like data partitioning and task scheduling. - Understand the impact of parallel computing on energy consumption and efficiency. - Explore advanced topics in parallel computing, such as parallel I/O or GPU programming.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - Introduction to Parallel Computing [4] Motivation and importance of parallel computing, Taxonomy of parallel computing systems, Parallelism levels: task, data, and instruction-level parallelism - Parallel Architectures [6]

Flynn's taxonomy: SISD, SIMD, MISD, MIMD; Shared-memory architectures: multiprocessors and multicores; Distributed-memory architectures: clusters and supercomputers; GPU architectures and programming models

3. Parallel Programming Models [12]

Shared-memory programming: OpenMP, Pthreads; Message Passing Interface (MPI); GPU programming: CUDA, OpenCL; Programming shared-address space systems (OpenMP, Pthreads); Programming scalable systems (message passing: MPI, global address space languages)

4. Parallel Algorithms and Techniques [10]

Parallelization techniques: task parallelism, data parallelism; decomposition techniques, mapping & scheduling computation, templates

5. Performance Analysis and Optimization [8]

Metrics for performance evaluation: speedup, efficiency, scalability; Bottleneck identification and optimization strategies; Load balancing techniques; Memory hierarchy optimization: caching and data locality

6. Parallelization of Applications [12]

Non-numerical algorithms (sorting, graphs); Numerical algorithms (dense matrix algorithms, sparse matrix algorithms)

8. Emerging Trends and Technologies [12]

Cluster, Grid, and Cloud computing and parallelism; Parallel computing in edge and IoT devices; Quantum computing and its potential impact on parallelism

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.

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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Material Covered

Week 1	introduction of parallel computing
Week 2	Parallel Architectures
Week 3	Parallel Algorithms and Techniques
Week 4	Programming shared-address space systems
Week 5	Programming scalable systems
Week 6	Performance Analysis and Optimization
Week 7	Mid Term Exam
Week 8	Analytical modeling of program performance
Week 9	Collective communication
Week 10	Synchronization
Week 11	Non-numerical algorithms (sorting, graphs)
Week 12	Numerical algorithms (dense matrix algorithms, sparse matrix algorithms)
Week 13	Performance measurement and analysis of parallel programs
Week 14	GPU Programming
Week 15	Emerging Trends and Technologies

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Material Covered

Week 1	Lab 1: Introduction to Parallel Programming
Week 2	Lab 2: Implement Parallel Reduction using Min, Max, Sum, and Average operations.
Week 3	Lab 3: parallel algorithms for Vector Operations.
Week 4	Lab 4: parallel algorithms for Matrix Operations.
Week 5	Lab 5: Parallel Sorting Algorithms.
Week 6	Lab 6: Parallel Search Algorithm.
Week 7	Lab 7: Parallel Search Algorithm.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- An Introduction to Parallel Computing, Design and Analysis of Algorithms, 2/e. Ananth Grama, Vipin Kumar, Anshul Gupta, and George Karypis. Addison-Wesley, 2003. - Parallel Programming in C with MPI and OpenMP. Michael J. Quinn. McGraw Hill, 2004	Yes
Recommended Texts	- Using OpenMP: Portable Shared Memory Parallel Programming - Barbara Chapman, Gabriele Jost, Ruud van der Pas (2008) - Using MPI: Portable Parallel Programming with the Message-Passing Interface, 3rd Ed - William Gropp, Ewing Lusk, Anthony Skjellum (2014) - Programming Massively Parallel Processors: A Hands-on Approach, 3rd Ed. - David B. Kirk, Wen-mei W. Hwu (2016)	No
Websites	https://www.mcs.anl.gov/~itf/dbpp/	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Advanced Control Systems			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET3201				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		3	Semester of Delivery		6
Administering Department		CET	College	EETC	
Module Leader				e-mail	
Module Leader's Acad. Title				Module Leader's Qualification	
Module Tutor				e-mail	
Peer Reviewer Name				e-mail	
Scientific Committee Approval Date		29/10/2023		Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CET3102	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims	
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أهداف المادة الدراسية	92. To define the stability analysis techniques applicable to control systems. 93. To develop problem-solving skills and an understanding of different stability criteria. 94. To understand the principles and conditions under which a system is stable or unstable. 95. To introduce students to stability margins, such as gain margin and phase margin. 96. To emphasize the importance of stability in feedback control systems. 97. To highlight the relationship between stability and system performance.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define poles and zeros of a transfer function. 2. Analyze the stability of the control system from the pole-zero plot. 3. Analyze the stability of the control system using Routh-Hurwitz criteria. 4. Identify the special cases of Routh's criterion. 5. Sketch the locus of roots in the s-plane as a parameter is varied. 6. Obtain $G(s)H(s)$ from characteristic equation 7. Comment on the stability of the system based on the complete Root Locus. 8. Solve Root Locus problems. 9. Define the frequency response of a system. 10. Use the logarithmic scales. 11. Identify the standard factors of $G(j\omega)H(j\omega)$. 12. Plot a graph of the system's frequency response using a Bode plot. 13. Comment on the stability of the system based on the Bode plot. 14. Obtaining the Transfer function from the Bode plot
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Stability of Control System</u> Poles and zeros of a transfer function, pole-zero plot, stability condition about s-plane, Hurwitz's criterion, Routh's stability criterion, special cases of Routh's criterion: special case 1 and special case 2. [10 hrs] Revision problem classes [6 hrs] <u>Part B – Root Locus Method</u>

	Definition of Root Locus, Rules of construction of Root Locus, General steps to solve the problem in Root Locus, obtaining $G(s)H(s)$ from the characteristic equation. [14 hrs]. Revision problem classes [8 hrs] <u>Part C – Bode Plot Method</u> Basics of frequency domain analysis, Magnitude plot, Phase angle plot, Logarithmic scales, frequency domain O.L.T.F., standard factors of $G(j\omega)H(j\omega)$, steps to sketch the Bode plot, stability analysis using Bode plot. [16 hrs] Revision problem classes [8 hrs] Transfer function from Bode plot [8 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module focuses on fostering active student engagement during exercises, fostering the development of critical thinking skills, and encouraging participation. This will be accomplished through a combination of classroom instruction, interactive tutorials, and the inclusion of engaging experiments that involve sampling activities that capture students' interest. The aim is to refine and enhance students' critical thinking abilities while ensuring their active involvement in the learning process.

Student Workload (SWL) الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125
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Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3, 12	LO # 1, 2, LO# 3- 11
	Assignments	2	10% (10)	6, 11	LO # 1-5, LO# 6-10
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 9-13
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Stability of Control Systems
Week 2	Routh-Hurwitz Criterion
Week 3	Special Cases of Routh's Criterion
Week 4	Root Locus Method
Week 5	Rules of Root Locus
Week 6	Solve Root Locus Problems
Week 7	Stability Analysis Using Root Locus
Week 8	Mid-term Exam
Week 9	Stability Analysis Using Bode plot
Week 10	Basics of Frequency Domain Analysis
Week 11	Bode Plot Method
Week 12	Bode Plot of Standard Factors of $G(j\omega)H(j\omega)$

Week 13	Stability Analysis Using Bode plot
Week 14	Transfer Function from Bode Plot
Week 15	Design of control systems and Compensation concepts.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: introduction to MATLAB commands
Week 2 , 3 & 4	Lab 2: Responses to different input signals
Week 5 , 6 & 7	Lab 3: Pole- Zero Plot and stability analysis
Week 8 , 9, 10 & 11	Lab 4: Root locus in MATLAB
Week 12 , 13 , 14 & 15	Lab 5: Bode plot in MATLAB

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Modern Control Engineering, K. Ogata, 2010 Pearson Education	Yes
Recommended Texts	3 . Control Systems Engineering, U.A. Bakshi and S.C. Goyal, 2007 Technical Publications. 4 . Modern Control Systems, R. Dorf and R. Bishop, 2011 Pearson Education	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Computer Network Fundamentals			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET3202				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		3	Semester of Delivery		
Administering Department		CET	College	EETC	
Module Leader				e-mail	
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor				e-mail	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		29/10/2023	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 Aims

أهداف المادة الدراسية

98. Understand the Basics of Networking: The module aims to provide students with a solid foundation in the fundamental concepts, principles, and components of computer networking.
99. Understand the purpose and importance of computer networks, network architectures, and network protocols.
100. Explore Network Infrastructure: The module aims to familiarize students with different types of networks, such as Local Area Networks (LANs) and Wide Area Networks (WANs).
101. Explore various network devices and technologies used in building and managing networks.
102. Network Addressing and Subnetting Skills: The module aims to enable students to comprehend IP addressing, subnetting, and related concepts.
103. Network Standards and Protocols: The module aims to introduce students to network standards and protocols established by organizations such as IEEE, IETF, and ISO

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

26. Explain the data communications, networking, protocols and standards, and networking models and how to create a data flow.
27. Understand the Data communications between remote parties can be achieved through a process called networking.
28. Understand the fundamental concepts and principles of computer networks, including network architectures, protocols, and models (such as OSI and TCP/IP).
29. Identify and describe the different network components and their functions, including routers, switches, firewalls, access points, and network cables.
30. Explain the relationship between data, which are created by a device, and electromagnetic signals, which are transmitted over a medium.
31. Explain the basics of network addressing, including IP addressing, subnetting, and the use of subnet masks.
32. Demonstrate knowledge of commonly used network protocols, such as IP, TCP, UDP, ICMP, and DNS, and understand their roles in network communication.
33. Analyze and describe different network topologies and architectures, including star, bus, ring, and mesh networks.

	34. Understand the fundamentals of network security, including common threats, encryption techniques, firewalls, and best practices for securing networks. 35. Configure and troubleshoot basic network settings, including IP addressing, subnetting, and network connectivity. 36. Explain the importance of network standards and protocols in ensuring interoperability and compatibility in network environments. 37. Demonstrate an understanding of network performance factors and techniques for optimizing network performance, including bandwidth management and Quality of Service (QoS) implementation. 38. Apply critical thinking and problem-solving skills to analyze and troubleshoot common network issues, such as network connectivity problems and network performance degradation. 39. Work effectively as a team member in network-related activities, demonstrating communication and collaboration skills. Demonstrate practical skills in configuring and managing network devices, such as routers, switches, and wireless access points.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. introduction to Computer Networks: 6 hrs Definition and purpose of computer networks : 6 hrs Network types and topologies : 6 hrs Network components and their functions : 6 hrs Network models: OSI and TCP/IP : 12 hrs Network Devices and Infrastructure : 6 hrs Routers, switches, and hubs : 6 hrs Network interfaces and media : 6 hrs Network cables and connectors : 6 hrs Network architectures: LAN, WAN, MAN : 6 hrs Network Addressing and Subnetting : 6 hrs IPv4 and IPv6 addressing : 6 hrs Subnet masks and subnetting techniques : 6 hrs

	IP address allocation and management : 4 hrs
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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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Total assessment	100% (100 Marks)		
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Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Networking, definition and purpose of computer networks
Week 2	Basic Concepts of Networking, Line configuration
Week 3	Transmission MOD
Week 4	Categories of Networks
Week 5	The OSI Model ,data protocol unit
Week 6	Main functions of the OSI Layers, TCP/IP Protocol Suite , IP address concept.
Week 7	Midterm Exam
Week 8	classes
Week 9	Subnetting
Week 10	Networking and Internetworks Devices
Week 11	Guided Transmission Media
Week 12	Unguided Transmission media
Week 13	Multiplexing technique
Week 14	FDM,TDM, and CDM
Week 15	Relationship between data, which are created by a device, and electromagnetic signals, which are transmitted over a medium.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Network ,Familiarization with the lab environment and tools
Week 2	Lab 2: Introduction to Networking Equipment familiarization with network devices such as routers, switches, and hubs.
Week 3	Lab 3: Connecting and configuring network devices.
Week 4	Lab 4: Network Cabling and Connections
Week 5	Lab 5: Configuring and troubleshooting Ethernet connections
Week 6	Lab 6: IP Addressing and Subnetting , assigning IP addresses to network devices.
Week 7	Lab 7: Network Configuration and Troubleshooting

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	" TCP/IP Protocol Suite" Fourth Edition Behrouz A. Forouzan	NO
Recommended Texts	"Data Communications and Networking", Fourth Edition by Behrouz A. Forouzan	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

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	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Database Systems		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET3203		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	6
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	

Scientific Committee Approval Date	29/10/2023	Version Number	1.0
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Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To learn the theory of the database. 2. To understand The Entity Relationship Model. 3. To Introduce SQL and SQL and relational database concepts. 4. To understand the Constraints imposed in a database. 5. Learn about Boolean Operators in SQL. 6. Learn about Normalization of a database. Learn about Storage and Query Processing, transaction, and recovery.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. To learn the theory of the database. 2. To understand The Entity Relationship Model. 3. To Introduce SQL and SQL and relational database concepts. 4. To understand the Constraints imposed in a database. 5. Learn about Boolean Operators in SQL. 6. Learn about Normalization of a database. Learn about Storage and Query Processing, transaction, and recovery.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part-A [15 Hrs]

Introduction to the theory: What is the benefit of using a database versus a shared file system? What is Data models and the relational database system? Data independence versus data-dependent data and how a database addresses these two issues. The Three-level Architecture and why it is necessary. What are the characteristics of each of these levels and the role of the database administrator in establishing the separation of these levels? What is database management systems, its components and how they work together?

Part-B [20Hrs]

The Entity Relationship Model: ER diagrams, resolution of M:N relationships, and Table Instance Charts (TICs). Translations of TICs into relational tables.

Introduction to SQL and relational database concepts: Relations and attributes. Candidate and primary keys. Foreign keys and why they are necessary. Introduction to relational operators and how they are applied. Creating and deleting tables.

Constraints imposed in a database: Updating and deleting rows in a table using the UPDATE TABLE, DELETE TABLE, and the DROP TABLE command with and without constraints. Implementation of the Selection and Projection operators. Ordering the results of a table according to a given attribute in ascending or descending orders.

Part-C [20 Hrs]

Boolean Operators in SQL: pattern matching using the LIKE clause, % and underscore characters. Arithmetic Operations and use of built-in functions in SQL. Introduction to Group functions using the Group by clause and additional built in functions. Processing dates and time and basic arithmetic with dates. Formatting of dates and times.

Normalization of a database.: First, second and third normal forms. How to detect anomalies and use of the Armstrong's axioms for determining functional dependencies. Importance of normalizing a database and the types of anomalies that may be encountered in First, Second, and Third Normal Forms. How to recognize, prevent, and how to get rid of anomalies in these forms.

	Part-D [20 hrs] Continuation of the normalization process: BCNF form and Dependency preservation. Algorithms to ensure dependency preservation. The Join operator and its different types. Advantages and disadvantages of higher normal forms from an operational point of view. Storage and Query Processing: RAID, Storage access, indexing and hashing, query processing and query optimization. Part-E [3] [10] Transaction Management and concurrency control: Transactions (concepts, state) and concurrency control (methods). Database Recovery: Concept and Recovery Techniques
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Learning and Teaching Strategies			
استراتيجيات التعلم والتعليم			
Strategies	The main strategy that will be adopted in delivering this module focuses on fostering active student engagement during exercises, fostering the development of critical thinking skills, and encouraging participation. This will be accomplished through a combination of classroom instruction, interactive tutorials, and the inclusion of engaging experiments that involve sampling activities that capture students' interest. The aim is to refine and enhance students' critical thinking abilities while ensuring their active involvement in the learning process.		
Student Workload (SWL)			
الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem)	64	Structured SWL (h/w)	4.26
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	61	Unstructured SWL (h/w)	4
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem)	125		
الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the theory: What is the benefit of using a database versus a shared file system? What is Data models and the relational database system? Data independence versus data-dependent data and how a database addresses these two issues. The Three-level Architecture and why it is necessary. What are the characteristics of each of these levels and the role of the database administrator in establishing the separation of these levels? What is database management systems, its components and how they work together?
Week 2	

Week 3	The Entity Relationship Model: ER diagrams, resolution of M:N relationships, and Table Instance Charts (TICs). Translations of TICs into relational tables.
Week 4	Introduction to SQL and relational database concepts: Relations and attributes. Candidate and primary keys. Foreign keys and why they are necessary. Introduction to relational operators and how they are applied. Creating and deleting tables.
Week 5	
Week 6	Midterm Exam
Week 7	Constraints imposed in a database: Updating and deleting rows in a table using the UPDATE TABLE, DELETE TABLE, and the DROP TABLE command with and without constraints. Implementation of the Selection and Projection operators. Ordering the results of a table according to a given attribute in ascending or descending orders.
Week 8	Boolean Operators in SQL: pattern matching using the LIKE clause, % and underscore characters. Arithmetic Operations and use of built-in functions in SQL. Introduction to Group functions using the Group by clause and additional built in functions. Processing dates and time and basic arithmetic with dates. Formatting of dates and times.
Week 9	
Week 10	Normalization of a database.: First, second and third normal forms. How to detect anomalies and use of the Armstrong's axioms for determining functional dependencies. Importance of normalizing a database and the types of anomalies that may be encountered in First, Second, and Third Normal Forms. How to recognize, prevent, and how to get rid of anomalies in these forms.
Week 11	Continuation of the normalization process: BCNF form and Dependency preservation. Algorithms to ensure dependency preservation. The Join operator and its different types. Advantages and disadvantages of higher normal forms from an operational point of view, join algorithm types.
Week 12	Storage and Query Processing: RAID, Storage access, indexing and hashing, query processing and query optimization.
Week 13	Transaction Management and concurrency control: Transactions (concepts, state) and concurrency control (methods).
Week 14	Database Recovery: Concept and Recovery Techniques
Week 15	Non-Relational Database systems: Document, Key-value, Column, Graph.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	An Overview of Database and SQL Query language: Introduction to PHP and MySQL, Setup steps, HTML Review Form Handling

Week 2	Basic PHP syntax, Comments, outputs
Week 3	Arithmetic and variable operation
Week 4	PHP: control statements, Loops, and Arrays
Week 5	Creating Database, tables in SQL
Week 6	Attribute Data Types and Domains in SQL
Week 7	The Entity Relationship (ER) Model: Drawing and converting entities with a relationship to relation table
Week 8	SQL Server Constraints, Select, Inserting to Data from Database
Week 9	Updating, Deleting, ordered By Data from Database
Week 10	Group Functions: AVG, MIN, MAX, SUM
Week 11	Join in SQL Server
Week 12	View data from Database
Week 13	Nested sub-queries
Week 14 & 15	Complete web application using PHP and MySQL

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Book#1: C. J. Date, "Introduction to Database Systems", 8th Ed. Publisher: Addison-Wesley, 2003 Book#2: Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", 7th Ed. Publisher: Pearson, 2016.	NO
Supporting Texts	Reference#1: A. Silberschatz, H. F.Korth, and S. Sudarshan, "Database System Concepts", 5th Ed. McGraw-Hill (2006). 5 . Reference#2: Database Systems the Complete Book by H. Garcia-Molina and et al. Prentice Hall; 2nd Edition	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Engineering Analysis	Module Delivery
Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical
Module Code	CET3204	
ECTS Credits	5	
SWL (hr/sem)	125	

			☐ Seminar
Module Level	3	Semester of Delivery	6
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Mathematics II (CET1204)	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This course aims to provide students with a fundamental understanding of basic and advanced engineering analysis techniques, including engineering components and systems.
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Module Learning Outcomes مخرجات التعلم للمادة الدراسية	40. Introduce the students to the theory and application of Laplace transform. 41. Give students an understanding of the time and frequency domain with different functions. 42. Get better in powered circuit analysis with applications and practical examples of matrix in Matlab. 43. Introduce the z-transform, which is the generalisation of the Laplace transform to discrete-time systems. 44. Provide students with a fundamental understanding of basic and advanced statistical techniques. 45. Provide students with a fundamental understanding of statistical measurements and graphs. 46. Provide an introduction to the method, tools and ideas of numerical computation, including the bisection method, false position method, and Newton-Raphson method. 47. Use numerical methods for solving algebraic and transcendental equations and solutions of linear and non-linear simultaneous equations. 48. Understand the basic theory of the numerical solution of ordinary differential equations. 49. Be familiar with the theorem that is related to matrices and its applications to analysis of the electronic circuits. 50. Learning the method of solving complicated equations. 51. Applying all of the above outcomes practically using Matlab.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - Laplace Transform [15 hrs] - Z-transform [15 hrs] - Numerical computations [15hrs] - solution of linear simultaneous [10hrs] - Solution of nonlinear equation [5 hrs] - Numerical solution of ordinary differential equation [5 hrs] - High-level assessment Matrix [5 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 the type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Fundamental of Laplace transform (L.T)
Week 2	properties, theorem of L.T
Week 3	Applications of L.T in electronic circuits
Week 4	Fundamental of Z-transform (Z.T), properties of Z.T

Week 5	Midterm Exam
Week 6	theorem of Z.T
Week 7	Applications of Z.T
Week 8	Numerical computations
Week 9	(bisection method, false position method,
Week 10	Newton Raphson's method, solution of algebraic and transcendental equations
Week 11	solution of linear simultaneous equations : 1)Direct methods: a)Gauss elimination B)Gauss Jordan
Week 12	2)Iterative method a)Jacobi's B)Gauss seidel iteration)
Week 13	Solution of nonlinear equation (Newton Raphson method)
Week 14	Numerical solution of ordinary differential equation (Picard's, Euler's method)
Week 15	Matrices solution of the linear system of equations, linear transformations, Cayley-Hamilton theorem

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Using Matlab in engineering analysis
Week 2	Lab 2: application of Laplace transform in electronic circuits.
Week 3	Lab 3: application of Z-transform
Week 4	Lab 4: bisection method
Week 5	Lab 5: newton-Raphson method
Week 6	Lab 6: Numerical solution of ordinary D.E
Week 7	Lab 7: Gaussian elimination and Gaussian Jordan methods

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Higher Engineering Mathematics by Dr. B.S. Grewal	Yes

Recommended Texts	An introduction to Numerical analysis by David F. Mayers	yes
Websites	www.ocw.mit.edu , www.math.uiowa.edu	

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 is required but credit awarded
	F – Fail	راسب	(0-44)	A 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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Data Communications	Module Delivery

Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET3205		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	6
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	The aims to students in third stage to defined and understand the

أهداف المادة الدراسية	Digital Modulation Synchronization Line Codes Spread Spectrum Systems Satellite Communication
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Describe digital communications modulation and Explain the modulation and demodulation of quadrature amplitude modulation 2 -Explain the advantage and disadvantage of each type of digital communications systems 4- Discuss the comparison between the types of digital systems and its advantages 5- Explain Synchronization 6- Describe Spread Spectrum Systems 7- Explain types Satellite Communication 8-Describe the Advantages and Applications of Microwaves
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - Digital Modulation (10 hr) - Synchronization (10 hr) - Line Codes (10 hr) - Spread Spectrum Systems (15 hr) - Satellite Communication (15hr) - Microwaves(10hr)
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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Digital Modulation: Quadrature Phase Shift Keying (QPSK), Offset QPSK
Week 2	Minimum Shift Keying, Gaussian Minimum Shift Keying (GMSK).
Week 3	Quadrature Amplitude Modulation (QAM), Multilevel Modulation Techniques M-ary PSK, M-ary QAM

Week 4	Synchronization: Phase Locked Loop (PLL) Recovery; Carrier Recovery: square law device,.
Week 5	Costas loop, DF PLL; Clock Recovery: spectrum line method, minimum mean square error, early-late gate method
Week 6	Line Codes: Binary Line Codes; Multilevel Signaling
Week 7	Mid exam
Week 8	Spread Spectrum Systems: Introduction; Advantages and Disadvantages; Pseudo Noise Sequence (PN Sequence) Generation and Properties
Week 9,10	Spread Spectrum Systems: Direct Sequence Spread Spectrum; Frequency Hopping Spread Spectrum (SFH, FFH).
Week 11	Satellite Communication: introduction; Types Of Satellites; Frequency Bands;
Week 12	Satellite Construction; Satellite Link Design;
Week 13	Modulation and Multiplexing Techniques: FDM/FM, TDM; Multiple Access: FDMA, TDMA, CDMA.
Week 14	Typical Frequencies; Band Designation;
Week 15	Introduction to antennas & Microwaves , Advantages of Microwaves; Applications of Microwaves.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Quadrature Phase Shift Keying (QPSK)
Week 2	Minimum Shift Keying
Week 3	Quadrature Amplitude Modulation (QAM), Multilevel Modulation Techniques M-ary PSK, M-ary QAM
Week 4	Phase Locked Loop (PLL) Recovery
Week 5,6	Direct Sequence Spread Spectrum; Frequency Hopping Spread Spectrum (SFH, FFH).
Week 7	Satellite Link Design; Modulation and Multiplexing Techniques: FDM/FM, TDM
Week 8,9	Design Multiple Access: FDMA, TDMA, CDMA

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Sarkar N., Elements of Digital Communications, first edition, 2003	NO
Recommended Texts	- Data Communications and Networking, Fourth Edition by Behrouz A. Forouzan	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Digital Image Processing	Module Delivery	
Module Type	Elective	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET3206		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	6
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	104. To become familiar with digital image fundamentals 105. To get exposed to simple image enhancement techniques in Spatial and Frequency domain. 106. To learn concepts of degradation function and restoration techniques. 107. To study the image segmentation and representation techniques. 108. To become familiar with image compression and recognition methods
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	52. Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms. 53. describe features of images. 54. Have a good understanding of the mathematical foundations for digital manipulation of images. 55. Operate on images using the techniques of smoothing, sharpening and enhancement. 56. image acquisition; preprocessing; segmentation; Fourier domain processing, compression and 57. analysis. 58. Be able to write programs using Matlab language for digital manipulation of images; image 59. Understand the restoration concepts and filtering techniques. 60. Be able to understand the documentation for, and make use of, the MATLAB library and MATLAB. 61. Acquisition; preprocessing; segmentation; Fourier domain processing; and compression. 62. Learn and understand the Image Enhancement in the Spatial Domain. 63. Learn and understand the Image Enhancement in the Frequency Domain. 64. Learn the basics of segmentation, features extraction, compression and recognition methods for color models.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Fundamentals</u>

Need for DIP- Fundamental steps in DIP – Elements of visual perception -Image sensing and Acquisition – Image Sampling and Quantization – Imaging geometry, discrete image mathematical characterization. [15 hrs]

Image Transforms

Two dimensional Fourier Transform- Properties – Fast Fourier Transform – Inverse FFT, Discrete cosine transform and KL transform.-Discrete Short time Fourier Transform- and its application in Compression. [10 hrs]

Image Enhancement

Spatial Domain: Basic relationship between pixels- Basic Gray level Transformations – Histogram Processing – Smoothing spatial filters- Sharpening spatial filters. Frequency Domain: Smoothing frequency domain filters- sharpening frequency domain filters Homomorphic filtering. [15 hrs]

Image Restoration:

Overview of Degradation models –Unconstrained and constrained restorations- Inverse Filtering , Wiener-Filter. [10 hrs]

Feature Extraction:

Detection of discontinuities – Edge linking and Boundary detection- Thresholding- -Edge based segmentation-Region based Segmentation- matching-Advanced optimal border and surface detection- Use of motion in segmentation. Image Morphology – Boundary descriptors- Regional descriptors. [10 hrs]

Image Reconstruction from Projections:

Need- Radon Transform – Back projection operator- Projection Theorem- Inverse Radon Transform. [10 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

The assessment strategy for this module is designed to provide students with the opportunity to demonstrate the skills and knowledge as described in the learning outcomes. The written examination will assess the knowledge of terminology, concepts and theory of Digital Image Processing, as well as the

ability to analyze problems and apply mathematical models of signal processing to solve and predict effects. The laboratory experiments will evaluate the acquired technical skills and expertise required to apply these methods to practical Digital Image Processing tasks.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Material Covered

Week 1

• Introduction and Digital Image Fundamentals:

- The origins of Digital Image Processing
- Examples of Fields that Use Digital Image Processing
- Fundamentals Steps in Image Processing

Week 2

Introduction and Digital Image Fundamentals (cont.):

- Image Sampling and Quantization,
- Some basic relationships like Neighbors, Connectivity, Distance
- Measures between pixels
- Translation, Scaling, Rotation and Perspective Projection of image

Week 3

Introduction and Digital Image Fundamentals (cont.):

- Linear and Non Linear Operations

Week 4

Image Enhancement in the Spatial Domain:

- Some basic Gray Level Transformations
- Histogram Processing

Week 5

Image Enhancement in the Spatial Domain (cont.):

- Enhancement Using Arithmetic and Logic operations

Week 6

Image Enhancement in the Spatial Domain (cont.):

- Combining Spatial Enhancement Methods
- Basics of Spatial Filters

Week 7

Mid-term Exam

Week 8

Image Enhancement in the Spatial Domain (cont.):

- Smoothing and Sharpening Spatial Filters

Week 9

Image Enhancement in the Spatial Domain (cont.):

	• Histogram Processing
Week 10	Image Enhancement in the Frequency Domain: • Introduction to Fourier Transform and the frequency Domain • Computing and Visualizing
Week 11	Image Enhancement in the Frequency Domain (cont.): • Smoothing Frequency Domain Filters
Week 12	Image Restoration: • A model of The Image Degradation / Restoration Process
Week 13	Image Restoration (cont.): • Inverse filtering • Wiener filtering
Week 14	Image Segmentation: • Detection of Discontinuities • Edge linking and boundary detection • Thresholding
Week 15	Object Recognition: • Patterns and Pattern Classes • Decision-Theoretic Methods

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Digital image Representation • Reading, Displaying, Writing Images using MATLAB • Data Classes, Image Types using MATLAB
Week 2	Lab 2: Digital image Representation (cont.) • Introduction to M Function Programming using MATLAB
Week 3	Lab 3: Image Enhancement in the Spatial Domain: • Intensity Transformation Function (MATLAB)
Week 4	Lab 4: Image Enhancement in the Spatial Domain (cont.): • Histogram Processing and Function Plotting (MATLAB)

Week 5	Lab 5: Image Restoration
Week 6	Lab 6: Image Segmentation.
Week 7	Lab 7: Object Recognition:

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of Digital Image Processing, Anil.K.Jain – ,Pearson Education-2003.	No
Recommended Texts	Rafael C. Gonzalez, Richard E. Woods, _Digital Image Processing', Pearson, Third Edition, 2010.	No
Websites	https://www.youtube.com/watch?v=6dFnpz_AEyA&list=PL9567DFCA3A66F299	

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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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	IoT Fundamentals		Module Delivery		
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	CET3207				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		3	Semester of Delivery		6
Administering Department		CET	College	EETC	
Module Leader			e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		

Scientific Committee Approval Date	29/10/2023	Version Number	1.0
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Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	6. To understand the basic principles of the Internet of Things. 7. To study the relationship between IoT and M2M. 8. To deal with using Arduino for IoT implementation. 9. To deal with using Raspberry Pi for IoT implementation. 10. To apply IoT solutions in different fields.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	13. Understand the basic concepts, architecture, and components of the Internet of Things (IoT). 14. Identify and describe the various networking technologies and protocols used in IoT systems, such as Wi-Fi, Bluetooth, Zigbee, and MQTT. 15. Explain the role of sensors, actuators, and embedded systems in IoT applications. 16. Gain knowledge of different IoT platforms and frameworks for developing IoT solutions.

	17. Demonstrate proficiency in designing and implementing simple IoT applications using Arduino boards. 18. Gain knowledge of using Python with the IoT platforms. 19. Demonstrate proficiency in designing and implementing simple IoT applications using Raspberry Pi boards. 20. Understand the principles of data communication and data management in IoT systems, including data collection, storage, and analysis. 21. Evaluate the impact of IoT on various industries, such as healthcare, transportation, agriculture, and smart cities. 22. Develop skills in integrating IoT devices and systems with cloud platforms and web services. 23. Apply IoT technologies to solve real-world problems and develop innovative IoT applications. 24. Collaborate effectively in teams to design and implement IoT projects or case studies.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - IoT concepts [14 hrs] Introduction to the Internet of Things, Characteristics of IoT, Physical design of IoT, Functional blocks of IoT, Sensing, Actuation, Basics of Networking, Communication Protocols, Sensor Networks. Part B – IoT using Arduino [16 hrs] Machine-to-Machine Communications, Difference between IoT and M2M, Interoperability in IoT, Introduction to Arduino Programming, Integration of Sensors, and Actuators with Arduino, Part C – IoT Using Raspberry Pi [16 hrs] Introduction to Raspberry Pi, Interfacing Raspberry Pi with basic peripherals, Implementation of IoT with Raspberry Pi, Introduction to Software-defined Network (SDN), SDN for IoT, Data Handling, and Analytics.

	Part D – IoT Applications [20 hrs] Sensor-Cloud, Smart Cities and Smart Homes, Connected Vehicles, Smart Grid, Industrial IoT, Case Study: Agriculture, Healthcare, Activity Monitoring.
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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	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	introduction to the Internet of Things
Week 2	IoT and M2M
Week 3	Introduction to Arduino Programming and Interfacing
Week 4	Implementation of IoT with Arduino
Week 5	Introduction to Raspberry Pi and Interfacing
Week 6	Implementation of IoT with Raspberry Pi
Week 7	Mid Term Exam
Week 8	Data Handling and Analytics
Week 9	Sensor-Cloud
Week 10	Smart Cities and Smart Homes

Week 11	Connected Vehicles
Week 12	Smart Grid
Week 13	Industrial IoT
Week 14	IoT Security
Week 15	IoT Case Study: Agriculture, Healthcare, Activity Monitoring

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Led Control Using Arduino Board
Week 2	Lab 2: Potentiometer And Ir Sensor Interfacing With Arduino
Week 3	Lab 3: Controlling Two Actuators Using Arduino
Week 4	Lab 4: Creation of Things Speak Account
Week 5	Lab 5: Actuator Controlling Through Cloud
Week 6	Lab 6: Dht11sensor Data To Cloud
Week 7	Lab 7: Iot Based Air Pollution Control System
Week 8	Lab 8: Tds Sensor Interfacing With Arduino
Week 9	Lab 9: Actuator Controlling by Mobile Using Arduino

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"The Internet of Things: Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press) - Vijay Madisetti, Arshdeep Bahga, "Internet of Things: A Hands-On Approach"	
Recommended Texts	Beginning Sensor networks with Arduino and Raspberry Pi – Charles Bell, Apress,	
Websites	Cisco Netacad course " Introduction to IoT" Learn Key Concepts With Introduction To IoT Course Networking Academy (netacad.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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Information Theory and coding		Module Delivery		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	CET4101				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		4	Semester of Delivery		7
Administering Department		CET	College	EETC	
Module Leader			e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		Ph.D.

Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	109. To develop problem solving skills and understanding of information theory through the application of techniques. 110. To understand the information representation. 111. This course deals with the basic concept of source coding. 112. To represent the information depending on the probabilities of events. 113. To compress the data by various types of compression. 114. To detect and correct the errors using channel coding methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	65. Having a skill to calculate the probability of any event. 66. Modeling the information transmission system. 67. Defined the information of noisy channel and posteriori probabilities. 68. Representation the information source based on Shannon . 69. Measure the information using entropies. 70. Represent various types of channel model. 71. Measure the entropy for various distribution methods. 72. Having a skill of modeling various types of channels as a matrix.

	73. Measure the capacity of various types channels. 74. Improve the data rate using various types of source code algorithms. 75. Having a basic skill of error detection and corrections
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Information theory</u> Random variable, Shannon representation method, entropy, Information transmission system. Source entropy, Marginal Entropy. [20hrs] <u>Part B – Channels</u> Types of channel model, channel matrix, Channel capacity. [20 hrs] <u>Part C – Source Coding</u> Fixed and variable length code, types of source code, measure of code efficiency, data compression, [25hrs] <u>Part d – Channel Coding</u> Need for channel code, redundancy data, block code, convolutional codes Revision problem classes for each above classes [20 hrs]

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

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.73
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review of related probability and statistics related topics.
Week 2	Model of information transmission system. Common sense definition of information Logarithmic measure of information. Self-information.
Week 3	Shannon representation diagram of information source. Parameters of discrete channel.
Week 4	Average information (entropy) of a discrete and continuous source, maximum source entropy. Source efficiency
Week 5	Transition probability matrix of channel, discrete noiseless and noisy channel models, uniform channel. Ternary symmetric channel.
Week 6	Information transmission over symmetric channel, noiseless channel, binary symmetric channel, ternary symmetric channel.
Week 7	Memory and memory less information channels .Binary Erasure channel (BEC).
Week 8	Capacity of discrete channel, channel capacity for noiseless channel. Channel efficiency and redundancy. Channel capacity for symmetric channels.

Week 9	Sampling of continuous source. Sampling Theorem. Nyquist theorem for transmission over band limited continuous channel. Shannon-Hartly channel capacity theorem.
Week 10	Midterm Exam
Week 11	Source encoding; fixed and variable length codes. Prefix property. Average length of source code. Source code efficiency and redundancy. Fano coding, Shannon- Fano methods.
Week 12	Huffman code, data compression
Week 13	Channel Coding in Digital Communication Systems. Forward Error Correction (FEC)
Week 14	Block codes. Cyclic Redundancy Check (CRC)
Week 15	Repetition Codes, Single Parity Check Codes

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Self information measurements
Week 2	Lab 2: Entropy measuring for multi-messages
Week 3	Lab 3: Mutual information measurements.
Week 4	Lab 4: Various channel representation.
Week 5	Lab 5: Losses channel measurements
Week 6	Lab 6: Data Compression applications
Week 7	Lab 7: Channel losses measurements

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas M. Cover, Joy A. Thomas, Elements of Information Theory, John Wiley & Sons, Inc. 1991	Yes
Recommended Texts	Coding Theory: Algorithms, Architectures, and Applications, Andreu Neubbauer, John Wiley & Sons, 2007	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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
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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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Computer Networks Protocols	Module Delivery ☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical
Module Type	Core	
Module Code	CET4102	
ECTS Credits	6	
SWL (hr/sem)	150	

			☐ Seminar
Module Level	4	Semester of Delivery	7
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Computer Network fundamental	Semester	6
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	115. Prepare network engineers who can prepare and design all types of networks. 116. This course teaches modern and advanced curricula in the field of computer networks. 117. Providing high-quality modern research that can be applied in the field of computer networks and the Internet. 118. Provides appropriate solutions to the problems of design and installation of networks and choose the best protocols.
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Module Learning Outcomes مخرجات التعلم للمادة الدراسية	76. Enable the students to apply their knowledge and skills in the field of computer networks to find practical solutions to any problems in this field and to be able to make appropriate decisions in the field of work. 77. Summarize the OSI model with all functions and objectives. 78. Discuss the protocols of each layer and its function and work. 79. Describe the network algorithms in the entire OSI model. 80. Describe the errors in networking communication. 81. Identify the solution for routing and forwarding in the network. 82. Discuss the explain the security of the network. 83. Discuss the protocols that deal with routing and security. 84. Explain the TCP/IP model and its relationship with the OSI model 85. Analyze, discuss, and use Network test results in the design and evaluation topology processes.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – OSI Network Model</u> Layering model. functions of each layer, Services, general view of each protocol in each layer, and functions of each protocol regarding each layer. [15 hrs] Physical layer and transmission, Data link layer and Errors, Algorithms of data link layers. [15 hrs] The network layer of the OSI model, Function and services, Routing Algorithm, protocol algorithm, and application, network failure and delay, [15 hrs] Error's function, Network failure, and solutions. [10 hrs] Revision problem classes [6 hrs] <u>Part B – Protocols of OSI model</u> Protocol of each layer in details, function and services, experimental application [15 hrs] Switching routing. Components and experimental switching and algorithms. [7 hrs]

	The transport layer, functions protocols, protocols application, and flow experiment. [5 hrs]
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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 simulation experiment, and tutorial lectures 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 networking activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome

Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1-3, LO #3-7
	Assignments	2	20% (10)	3, 12	LO # 1-3, LO#3-8
	Projects / Lab.	1	10% (10)	Continuous	
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-4
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Protocol Hierarchies in OSI model: (Application layer, presentation layer, session layer, transport layer, network layer, datalink layer. Physical layer) basics. PDU
Week 2	Physical Layer Protocols, Protocol Design Issues, Transmission, and Multiplexing Protocol Functionality, Layering, and Framework (SP3)
Week 3	Link layer: Services Provided by the Link Layer, Multiple Access Links and HDLC Protocols, Taking-turns protocols,
Week 4	Link layer Error control and flow control algorithms MAC Protocols (Ethernet, DSL, ISDN, FDDI) ; CSMA/CD
Week 5	Link layer: Types of errors, Checksum algorithms CRC, MAC, Switch, ARP, L2TP, PPP Network Layer Protocols, Concepts, and Routing Algorithms.
Week 6	Network Layer Protocols - OSPF routing, EIGRP routing Rip, BGP, ICMP, DHCP
Week 7	Midterm Exam
Week 8	Network Protocols: RIP, BGP, ICMP, and DHCP. Network layer components Routing Algorithms (LS, DV)
Week 9	IP (Internet Protocol), IP Datagram Fragmentation IPv4, IPv6, IPsec
Week 10	Transport Layer Protocols Design Congestion Control, Flow Control- Services
Week 11	MUX, DMUX, Connectionless, Connection Oriented. TCP/UDP Analysis and Implementation
Week 12	Presentation Protocols: Security Protocols (SSL, SSH)

Week 13	Application Layer Protocols (Architecture, services)
Week 14	Protocols: WWW (HTTP, HTTPS, FTP, DHCP,)
Week 15	TCP/ IP Model & Protocols Stack Electronic Mail Protocols (SMTP, POP) DNS, Telnet protocols

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Cisco packet tracer and configuration Review
Week 2	Lab 2: VLAN network
Week 3	Lab 3: Inter-VLAN Techniques
Week 4	Lab 4: Static Routing Protocol
Week 5	Lab 5: Dynamic Routing Protocol (RIP)
Week 6	Lab 6: Dynamic Routing Protocol (RIP)
Week 7	Lab 7: DHCP,
Week 8	Lab 8: HTTP,DNS Protocol
Week 9	Lab 9: IPv6
Week 10	Lab 10: Router and Switch Security

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	: Computer Networking A Top Down Approach. Author : James F. Kurose, Keith W. ross Edition/Publisher/year : 6 th , 7 th edition /Pearson 2013,2018	Yes
Recommended Texts	Internetworking with TCP/IP Author : Douglas E. corner	No

Websites	https://www.coursera.org/browse/physical-science-and-engineering/
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Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Mobile Communications			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET4103				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		4	Semester of Delivery		7
Administering Department		CET	College	EETC	
Module Leader			e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		29/10/2023	Version Number		1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Digital Communications	Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	It is aimed at students on the fourth stage definition - Concepts and terminology used in cellular systems - The study of developments in the generation cellular system - How to design cells - How to cover all the cell by signal and at all spaces - Types of modulation signal in Cellular Communications - Wireless systems construction, design and processing of interference signals - explain Multiple Access Techniques
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Identify concepts and terms used in cellular systems 2- Explain the signal analysis and how coverage in each cell 3- compare between all generations and how they evolve 4 Explain the internal structural study of the cells 5- Discuss the Hand off Strategies 6- Design cellular system 7- Discuss the how to cover the signal to all the cells 8- Explain how can small number of channels can accommodate large number of random users 9- Design, planning and analysis of the signals for sending and receiving 10 explain Modulate a digital signal and demodulation as Multiple Access
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - Introduction to Wireless Communication System (10 hr) - The Cellular Concept-System Design Fundamentals (24 hr) - Traffic Engineering (10 hr) - Large scale path loss (15 hr) - Multiple Access Techniques (15 hr)

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

Student Workload (SWL) الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.73
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Evolution of mobile communications, Mobile Radio System around the world
Week 2	Types of Wireless communication System
Week 3	Trend in Cellular radio and personal communication, 1 st , 2 nd ,3 rd 4 th ,5 th generations
Week 4	Cellular system, Hexagonal geometry cell and concept of
Week 5	frequency reuse, Channel Assignment Strategies Distance to frequency reuse ratio
Week 6	Channel & co-channel interference reduction factor,
Week 7	S/I ratio consideration and calculation for Minimum Co-channel and adjacent interference
Week 8	Midterm Exam
Week 9	Handoff Strategies .Trucking and Grade of Service,
Week 10	Improving Coverage & Capacity in Cellular System-cell splitting, Cell sectorization
Week 11	Free Space Propagation loss equation, Path-loss of NLOS and LOS systems,
Week 12	Link budget design
Week 13	Frequency Division Multiple Access (FDMA). Time Division Multiple Access (TDMA).
Week 14	Wi-Fi, WiMAX, ZigBee Networks
Week 15	Software Defined Radio, UWB Radio

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Digital Communications-BPSK Modulation ,
Week 2	QPSK modulation, 16 QAM Modulation
Week 3	Implement Communication System Compute the system's BER & Computing the Symbol Error Rate (cellular terms)
Week 4	Wireless link , path loss calculation
Week 5	Link budget design
Week 6	Frequency Division Multiple Access (Multiplexing & DeMultiplexing)

Week 7	Time Division Multiple Access(Multiplexing & DeMultiplexing)
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Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	- Mischa Schwartz, Mobile Wireless Communications, Cambridge University Press 2005	No
Recommended Texts	- J. G. Proakis, Digital Communications, 4th ed. NY: McGraw Hill, 2000	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Engineering Management		Module Delivery	
Module Type	S		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET4104			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	4	Semester of Delivery		7
Administering Department	CET	College	EETC	
Module Leader			e-mail	
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims

أهداف المادة الدراسية

- 119. Knowledge of the main concepts and elements of project management.
- 120. Knowing the ways to draw network diagrams for projects
- 121. Knowledge and understanding of the linear programming process for engineering projects
- 122. Knowing the methods of calculating the cost per unit of production and finding the break-even point.
- 123. Knowing the Economics for the engineers.
- 124. To understand the Productivity.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

- 86. List the element of engineering management.
- 87. Define the Economics for the engineers
- 88. Drawing the Gantt Chart.
- 89. Knowing how to draw network diagrams for the project.
- 90. Knowledge of project critical path finding, project total tolerance, early and late start, the early and late end of the activities in the project.
- 91. Define Project Evaluation and Review Technique (PERT).
- 92. Identify standard deviation and variants.
- 93. Crashing of project network.
- 94. Knowing and understanding the Linear programming: graphical method
- 95. Knowing, understanding linear programming: simplex method.
- 96. Knowing, understanding and drawing the break-even point of the project.
- 97. Knowing the Productivity

Indicative Contents

المحتويات الإرشادية

Indicative content includes the following.

Introduction of management, main elements of project management, steps/phases of project management, Economics for the engineers [10 hrs.]

Gantt Chart, Networks, activity on arrow, activity on anode [10 hrs.]

Critical path method, Cp, float, early start, early finish, late start, late finish(CPM) [10hrs]

	Pert technique(Time-Cost) Pert technique Expected time, slack, standard deviation and variants, the probability, crashing of project [16 hrs.] Linear programming: graphical method, Linear programming: simplex method [15 hrs.] The break-even point Productivity. [10 hrs.]
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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 type of simple experiments involving some sampling activities that are interesting to the students. Daily evaluations- quarterly evaluations- finally evaluations- practical evaluations- presentation evaluations- attend daily- weekly reports.

Student Workload (SWL) الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Quizzes	2	10% (10)	5, 10	LO #1-4 , LO #5-9

Formative assessment	Assignments	2	10% (10)	3, 12	LO # 1,2, LO#3-10
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1-12
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of management
Week 2	Economics for the engineers
Week 3	Gantt Chart
Week 4	Networks
Week 5,6	Critical path method(CPM)
Week 7	Mid-term Exam
Week 8,9,10	Pert technique(Time-Cost)
Week 11	Linear programming: graphical method
Week 12,13	Linear programming: simplex method
Week 14	The break-even point
Week 15	Productivity

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Microsoft Project
Week 2	Setup a New project
Week 3	Creating a Calendar for the project
Week 4	Adding tasks to the project

Week 5	Set up resources
Week 6	Formatting and sharing a plan
Week 7	View and report project status

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	J.R. Meredith and S.J. Mantel "Project Management", J. Wiley & Sons, 1995.	No
Recommended Texts	Y. Bakouros and V. Kelessidis "Project management" INNOREGIO: dissemination of innovation and knowledge management techniques, January 2000	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Artificial Intelligence		Module Delivery
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET4105		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	1- Provides a comprehensive introduction to artificial intelligence (AI) and neural networks. 2- Learn the fundamentals of AI, including problem-solving, reasoning, knowledge representation, and machine-learning techniques. 3- Study the various types of neural networks and their architectures. 4- Demonstrate the applications in real-world scenarios. 5- Gain hands-on experience in implementing and training neural networks using popular frameworks and tools.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the principles and theories underlying artificial intelligence. 2- Explain the concepts of machine learning, including supervised, unsupervised, and reinforcement learning. 3- Demonstrate proficiency in programming languages commonly used in AI and neural network applications. 4- Understand the fundamental concepts and principles of artificial neural networks (ANNs). 5- Explain the architecture and components of different types of ANNs, 6- Design and implement neural network architectures for various tasks, such as classification, regression, and pattern recognition. 7- Train and optimize neural networks using appropriate algorithms and techniques. 8- Evaluate and compare the performance of different neural network models using appropriate evaluation metrics. 9- Understand the limitations and challenges associated with training and deploying neural networks. 10- including feedforward, recurrent, and convolutional neural networks. 11- Optimize ANNs using appropriate algorithms and techniques, such as gradient descent and backpropagation.

	12- Explore the applications of ANNs in different fields.		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- Introduction to Artificial Intelligence [5 hrs] History and evolution of AI, AI applications and impact on society, AI problem-solving approaches. 2- Machine Learning Fundamentals [5 hrs] Supervised, unsupervised, and reinforcement learning; Training, validation, and testing of machine learning models; Evaluation metrics for assessing model performance. 3- Neural Networks Basics [25 hrs] Fundamentals of biological Neural Networks, basic principles of ANNs, and their early structures; Properties of ANN, advantages, and disadvantages; Types of learning rules, learning algorithms, training styles 4- Neural Networks Algorithms [25 hrs] Hebb Network, Perceptron, and activation functions; Feedforward neural networks and backpropagation algorithm; Optimization algorithms (e.g., gradient descent) 5- Introduction to Deep Learning and Convolutional Neural Networks [5 hrs] Introduction to deep learning; Convolutional neural networks (CNNs) and their architectures; Image classification and object recognition using CNNs.		
	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 موزع على (15) اسبوع			
Structured SWL (h/sem)	64	Structured SWL (h/w)	4.26

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Artificial Intelligence
Week 2	Machine Learning Fundamentals
Week 3	Fundamentals of Biological Neural Networks, and their early structures
Week 4	Properties of ANN, advantages, and disadvantage
Week 5	Network architectures, logic gates
Week 6	Types of learning rules, learning algorithms, training styles
Week 7	Hebb Net, Applications,
Week 8	Character recognition
Week 9	Mid Term Exam
Week 10	Perception: Architecture, Algorithm, Applications
Week 11	Adaline: Architecture, Algorithm, Applications

Week 12	Mdaline: Architecture, Algorithm
Week 13, 14	Backpropagation Neural Network: Architecture, Algorithm, Applications
Week 15	Introduction to Deep Learning and Convolutional Neural Networks

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	McCulloch-Pitts neurons: Logic Functions
Week 2	Hebb Net: Logic Functions (Binary input and output, Binary input and bipolar output, bipolar input and output)
Week 3	Hebb Net: Character recognition (Two-dimensional input pattern with different letters)
Week 4	Perceptron for different logic functions
Week 5	Adaline for different logic functions
Week 6	Backpropagation for different architecture: Logic gate
Week 7	Backpropagation for different architecture: real applications
Week 8	Image classification and object recognition using CNNs.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig.	No
Recommended Texts	-	No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

	Module Information				
	معلومات المادة الدراسية				
Module Title	Web Design		Module Delivery		
Module Type	E		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	CET4106				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		4	Semester of Delivery		7

Administering Department	CET	College	EECT
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	125. This course will introduce students to the realm of web design. : page composition, XHTML, CSS, web design and code validation. 126. Students will cover the Web design/development process. 127. Topics covered include basic and enhanced site structure, local and remote site management, and optimization of Web-site performance. 128. Provides appropriate knowledge to web servers and browsers of the internet and network communication.
Module Learning Outcomes	98. Be able to use the HTML programming language, Resolves written HTML codes, Runs the page he/she has designed using HTML codes 99. Create an Information Architecture document for a web site,

مخرجات التعلم للمادة الدراسية	100. Construct a web site that conforms to the web standards of today and includes e-commerce and web marketing. 101. Publish the website to a remote server using FTP. 102. Perform regular web site maintenance (test, repair and change). 103. Uses Domain Name and services 104. Be able to make changes on the Site. 105. Updates on the site when needed 106. Be able to use the Design Programs. 107. Designs and publish websites.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Web Designer</u> _Specific skills would be design-tools-of-choice, HTML, CSS, and light JavaScript., [10 hrs] Front End Developer. focused on HTML, CSS, JavaScript, and light backend work. The lack of "designer" concepts beyond the core technologies, for instance regression testing or performance. [10 hrs] Technology specific job titles "JavaScript Developer" or "JavaScript Engineer" for a job where that is primarily what needs to be done., [10 hrs] UI Designer, light on HTML and CSS skill, A synonym might be a Visual Designer. [10 hrs] UX Designer, studying and researching how people use a site. Then ushering changes for the better through the system and testing the results, [5 hrs] <u>Part B – internet Architecture and publishing</u> Interaction Designer, Primarily design, just like a UI Designer, but with specific focus on how things are used and moved. [10 hrs] Web Developer, This job is focused on back end work and working with languages specific to the web, like PHP, ASP, Ruby, Python, etc. Medium skill in database/server work [10 hrs]

Full Stack Developer. The structural design of websites like the taxonomies, metadata, scheduling, and analysis of content. A synonym might be Information Architect. [8 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

The course will combine guided core reading, a series of short individual tasks, synchronous and asynchronous discussions, group working, resource sharing and hands -on experience on website development. Tutor support will be provided throughout the course. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving Designing that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1-3, LO# 3-8
	Assignments	2	10% (10)	3, 12	LO #1,2, LO# 3-7
	Projects / Lab.	1	10% (10)	Continuous	All

	Report	1	10% (10)	13	LO # 1-10
Summative assessment	Midterm Exam	2 hr	10% (10)	9	LO # 1-6
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to HTML : Introduction to Internet programming, HTML language, Description and running through IE, How to write codes in HTML?, Headings, titles. The body in HTML language, background colors, pages and breaks
Week 2	Lists & Tables in HTML language : Ordered list and unordered list, creating table, table attributes and features, Images : Images , Combining paragraphs with table and images.
Week 3	Forms in HTML I : Command buttons, Textboxes and text areas, Checkboxes and
Week 4	Forms in HTML II : Select lists in Forms, combining Forms with images and tables, Introduction to dynamic programming, client side versus server side
Week 5	Client-Side Programming and Server-Side Programming : Client-Side Programming and Server-Side Programming, JavaScript, What is JavaScript, What JavaScript can do?, What JavaScript can't do?, The Script Tag, Handling older browsers, JavaScript Statements, Script statement execute, JavaScript data types, Variables, Data type conversion, browser events.
Week 6	Arithmetic Operators : Arithmetic operators, Comparison operators, Examples and solutions, Control Structures (if statement, if-else statement), Loops (for loop), Functions, Function parameters
Week 7	Window and Document objects : Window and Document objects, the window object, creating window, properties and methods: window.status, window.alert, window.confirm, window.prompt
Week 8	Forms and Form elements : Forms and Form elements, creating a form, form properties, text object, form object button object, checkbox object, Radio object, Select object,
Week 9	Midterm Exam
Week 10	Test 2: functions, forms and dates , Passing form data to functions, Submitting forms, Strings, Math and Date, Examples and solutions. Images and dynamic HTML : Images and dynamic

	HTML, the image object, interchanging images, prechaching images, creating image rollover, Examples and solutions. The String object (in detail), Examples and solutions
Week 11	The events: The event object, Event handler, Event properties, Window event-handler, layer event handler, mouse event handler, other event handlers
Week 12	Global functions: Global functions and statements, eval(), escape(), isNaN(), number(), parseFloat(), parseInt(), string(), unescape(), unwatch(), watch()
Week 13	Data-Entry : Data-Entry validation, isEmpty(), isNumber(), isInteger(), isPosInterger Test 3: Images, Strings, and Global functions String : The String object, Examples and solutions
Week 14	JS frameworks
Week 15	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction Xhtml language
Week 2	Lab 2: web page design , opening, saving
Week 3	Lab 3: text, font design implementation
Week 4	Lab 4: color, image, implementation .
Week 5	Lab 5: list, groups, page division
Week 6	Lab 6: forms , linking pages, meta function ,hyperlink
Week 7	Lab 7: publishing and linking page with internet.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	The Complete Internet and World Wide Web Programming Training course Author : Harry M.Deitel, Paul J. Deitel, Tom Nieto	Yes

	Edition & Year public : Prentice Hall PTR,2000	
Recommended Texts	Java script : the definition Guide, Author :David Flanagan, O'Reilly Media Edition & Year public : 5 th edition , 2006	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/web	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Distributed Computing & Systems		Module Delivery	
Module Type	E		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET4107			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	4	Semester of Delivery	7	
Administering Department		College		
Module Leader		e-mail		
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	29/10/2023	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 Aims	
أهداف المادة الدراسية	129. To introduce students to the fundamental problems, concepts, and approaches in the design and analysis of distributed computing systems.

	130. To familiarize students with the stages of the distributed system design cycle, including system architecture, data and processes arrangements, naming, communication and coordination issues, existing distributed computing paradigms, techniques, and tools, and evaluating the effectiveness of distributed application systems for specific data, task, and user types. 131. understand the evolution of the distributed computing from its early beginnings as multi-processor and multi-computer systems, to computer networks, to the emerging cloud, edge (fog, dew, mist) and heterogeneous computing environments 132. explain and discuss basic principles and typical examples of real-world distributed systems such as NFS file-sharing system and the web. 133. understand process migration or more specifically code migration and its role in achieving scalability of distributed system
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	108. State, prove and apply Shannon's sampling theorem know the widely used models of communication: Remote Procedure Call (RPC), and Message-Oriented Middleware (MOM). 109. know basic principles of the RPC model and problems with achieving distribution transparency. 110. understand the peculiarities of the high-level message-queuing model of process communication. 111. know how to set up multicast facilities for data dissemination in distributed systems. 112. understand traditional deterministic means of multicasting as well as probabilistic approaches. 113. know the use of Domain Name System (DNS). 114. know the way of using attributes assigned to an entity to resolve a description of an entity in distributed system. 115. know basics of the security management including mechanisms to distribute cryptographic keys, add and remove users from a system, prove ownership to access specified resources, etc...
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Introduction: Design goals</u>

Distributed systems consist of autonomous computers that work together to give appearance of a single coherent system. Design goals for distributed systems include sharing resources and ensuring openness. In addition, designers aim at hiding many of the intricacies related to distribution of processes, data and control. [10 hrs]

Types of systems

Different types of distributed systems exist which can be classified as being oriented towards supporting computations, information processing and pervasiveness. Distributed computing systems are typically deployed for high-performance applications often originating from parallel computing. Cloud computing goes beyond high-performance computing and also supports distributed systems found in traditional office environments. An emerging class of distributed systems is represented by pervasive computing environments, including mobile-computing systems as well as sensor-reach environments. [10 hrs]

Architectures: Architectural styles. Middleware

We can make a distinction between software architecture and system architecture. AN architectural style reflects the basic principle that is followed in organizing the interaction between the software components comprising a distributed system. Important styles include layering, object-based styles, resource-based styles, and styles in which handling events are prominent. [10 hrs]

Communication: Foundations. RPC

Communication between processes is essential for any distributed system. In traditional network applications, communication is often based on the low-level message-passing primitives offered by the transport layer. One of the most widely used abstractions is the Remote Procedure Call (RPC), that offers synchronous communication facilities, by which a client is blocked until the server has sent a reply. [10 hrs]

Communication: Message-oriented & Multicast communication

Message-oriented middleware models generally offer persistent asynchronous communication, and are used where RPCs are not appropriate. An important

class of communication protocols in distributed systems is multicasting. [10 hrs]

Naming: Names, IDs. Flat naming

Names are used to refer to entities. There are three types of names: an address, an identifier, and human-friendly names. Given these types, we make a distinction between flat naming, structured naming, and attribute-based naming. Systems for flat naming essentially need to resolve an identifier to the address of its associated entity. This can be done in different ways. [10 hrs]

Fault tolerance

Fault tolerance is defined as the characteristic by which distributed computing system can mask the occurrence and recovery from failures. Several types of failures exist. Redundancy is the key technique needed to achieve fault tolerance. When applied to processes, the notion of process groups becomes important. The real problem is that members of a process group need to reach consensus in the presence of various failures. Paxos is by now a well-established and highly robust consensus algorithm. [10 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

The assessment strategy for this module is designed to provide students with the opportunity to demonstrate the skills and knowledge as described in the learning outcomes. The written examination will assess the knowledge of terminology, concepts and theory of Distributed Computing & Systems, as well as the ability to analyze problems and new features of distributed computing systems to solve and predict effects. The laboratory experiments will evaluate the acquired technical skills and expertise required to apply these methods.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem)

64

Structured SWL (h/w)

4.26

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Design goals Distributed systems consist of autonomous computers that work together to give appearance of a single coherent system.
Week 2	Architectures: System architecture. Example There are many different organizations of distributed systems. Client-server architectures are often highly centralized.
Week 3	Processes: Threads. Virtualization Processes play a fundamental role in distributed systems as they form a basis for communication between different machines.
Week 4	Processes: Clients. Servers.
Week 5	Communication: Foundations. RPC

Week 6	Naming: Structured naming. Attribute-based naming
Week 7	Mid-term Exam
Week 8	Coordination: Clock synchronization There are various ways to synchronize clocks in a distributed system. All methods are based on exchanging clock values, while taking into account the time it takes to send and receive messages.
Week 9	Midterm Exam
Week 10	Coordination: Mutual exclusion. Election algorithms An important class of synchronization algorithms is that of distributed mutual exclusion. These algorithms ensure that in a distributed collection of processes, at most one process at a time has access to a shared resource. Consistency and replication: Data-centric & Client-centric models
Week 11	Consistency and replication: Replica management. Consistency protocols
Week 12	Fault tolerance.
Week 13	Security
Week 14	Distributed System Models and Enabling Technologies
Week 15	Parallel Programming Systems and Models

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Distributed Systems. (Build a Cluster)
Week 2	Lab 2: Distributed System Models and Enabling Technologies. (Benchmarking)
Week 3	Lab 3: Parallel Programming Systems and Models. (Map Reduce)
Week 4	Lab 4: Cloud Computing.
Week 5	Lab 5: File systems & Networked file systems.
Week 6	Lab 6: Optimizing Large Data Transfers over 100Gbps Wide Area Networks - Anupam Rajendran.
Week 7	Lab 7: Distributed Filesystems.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Tanenbaum S. Maarten V.S.: Distributed Systems Principles and Paradigms, (Pearson Education).	No
Recommended Texts	George Coulouris, Jean Dollimore. Tim Kindberg: Distributed Systems concepts and design.	No
Websites	https://www.youtube.com/watch?v=cQP8WApzIQQ&list=PLrw6a1wE39_tb2fErI4-WkMbsvGQk9_UB&ab_channel=MIT6.824%3ADistributedSystems	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Professional Ethics		Module Delivery		
Module Type	B		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	MTU1008				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		4	Semester of Delivery		7
Administering Department		CET	College	EETC	
Module Leader			e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		29/10/2023	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 Aims

أهداف المادة الدراسية

The module aims to:

1. To develop an understanding of the fundamental concepts and principles of engineering ethics.
2. To explore ethical theories and frameworks relevant to engineering practice and decision-making.
3. To familiarize students with codes of ethics and professional conduct in the engineering field.
4. To cultivate ethical decision-making skills and the ability to analyze and resolve ethical dilemmas in engineering.
5. To promote awareness of social, environmental, and global dimensions of engineering ethics and their impact on professional practice.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

By the end of the module, students should be able to:

1. Demonstrate a comprehensive understanding of the principles and importance of engineering ethics in professional practice.
2. Apply ethical theories, frameworks, and decision-making models to analyze and resolve ethical dilemmas in engineering.
3. Evaluate the social, environmental, and global impact of engineering decisions and recognize the ethical responsibilities of engineers in these contexts.
4. Comprehend the professional obligations and responsibilities of engineers, including codes of ethics and professional conduct.
5. Reflect on personal ethical development, demonstrate ethical awareness, and engage in lifelong learning in the field of engineering ethics.

Indicative Contents المحتويات الإرشادية	1. Introduction to Engineering Ethics: [18 hrs.] • Definition and importance of engineering ethics. • Ethical theories and frameworks in engineering. • Codes of ethics and professional conduct. 2. Ethical Decision-Making: [18 hrs.] • Steps in ethical decision-making. • Utilitarianism and consequentialist ethics. • Deontological ethics and duty-based approaches. 3. Professional Responsibility and Accountability: [18 hrs.] • Professionalism and professional identity. • Professional obligations and responsibilities. • Ethical and legal aspects of professional practice. 4. Social and Environmental Impact of Engineering: [18 hrs.] • Engineering and sustainability. • Environmental ethics and considerations. • Social responsibility and stakeholder engagement. 5. Ethical Issues in Research and Innovation: [18 hrs.] • Research integrity and responsible conduct of research. • Intellectual property rights and plagiarism. • Ethical considerations in technological innovation.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The learning and teaching strategies for the module on Computer Principles and operating systems can include: 1. Lectures and Presentations: The instructor delivers lectures and presentations to provide theoretical knowledge and concepts related to engineering ethics. This helps students understand the fundamental principles and frameworks. 2. Case Studies and Discussions: Engaging students in analyzing real-world case studies allows them to apply ethical theories and decision-making models to practical situations. Discussions and group activities encourage critical thinking and ethical reasoning. 3. Ethical Dilemma Analysis: Presenting students with ethical dilemmas specific to engineering contexts enables them to identify

and evaluate conflicting values and potential courses of action. This fosters ethical decision-making skills and ethical awareness.

4. Guest Speakers and Expert Sessions: Inviting guest speakers, such as experienced professionals or ethics experts, to share their insights and experiences enriches the learning process. These sessions provide practical perspectives and real-world examples.
5. Group Projects and Presentations: Assigning group projects related to engineering ethics encourages collaboration, research, and application of ethical principles. Students can explore specific topics, develop solutions, and present their findings, fostering critical thinking and communication skills.
6. Ethics Workshops and Debates: Organizing workshops and debates focused on ethical topics in engineering allows students to actively engage in discussions, explore different viewpoints, and develop their argumentation skills.
7. Ethical Reflection and Self-Assessment: Providing opportunities for students to reflect on their personal values, ethical beliefs, and professional aspirations promotes self-awareness and encourages students to align their actions with ethical principles.
8. Online Resources and Learning Platforms: Utilizing online resources, such as interactive modules, online discussions, and ethical case repositories, enhances accessibility to additional learning materials and facilitates self-paced learning.
9. Assessment Methods: Assessing students through assignments, quizzes, exams, and presentations ensures their understanding of ethical theories, decision-making models, and their ability to apply them in practical scenarios.
10. Field Visits and Industry Engagements: Organizing visits to engineering organizations or engaging with industry professionals allows students to observe ethical practices in real-world settings and understand the challenges and responsibilities faced by engineers.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction to Engineering Ethics • Definition and importance of engineering ethics. • Ethical theories and frameworks in engineering. • Codes of ethics and professional conduct.

Week 2	Ethical Decision-Making Models • Steps in ethical decision-making. • Utilitarianism and consequentialist ethics. • Deontological ethics and duty-based approaches.
Week 3	Professional Responsibility and Accountability • Professionalism and professional identity. • Professional obligations and responsibilities. • Ethical and legal aspects of professional practice.
Week 4	Social and Environmental Impact of Engineering • Engineering and sustainability. • Environmental ethics and considerations. • Social responsibility and stakeholder engagement.
Week 5	Conflicts of Interest and Ethical Dilemmas • Identification and resolution of conflicts of interest. • Ethical dilemmas in engineering practice. • Balancing competing ethical considerations.
Week 6	Ethical Issues in Research and Innovation • Research integrity and responsible conduct of research. • Intellectual property rights and plagiarism. • Ethical considerations in technological innovation.
Week 7	Engineering and Public Safety • Risk assessment and management in engineering. • Safety standards and regulations. • Whistleblowing and professional accountability.
Week 8	• Midterm Exam
Week 9	Ethical Leadership and Professional Integrity • Ethical leadership in engineering organizations. • Integrity and ethical behavior in the workplace. Ethical implications of professional relationships. Global and Cultural Perspectives in Engineering Ethics • Cultural relativism and ethical relativism. • Cross-cultural communication and ethical challenges. • Global engineering ethics and international standards.
Week 10	Ethical Issues in Emerging Technologies • Ethical considerations in artificial intelligence. • Biomedical ethics and emerging medical technologies. • Ethical challenges in nanotechnology and genetic engineering.
Week 11	Ethical Responsibilities to Clients and Customers • Professional obligations to clients and customers. • Confidentiality and privacy in engineering practice. • Fair competition and avoiding conflicts of interest.
Week 12	Ethical Responsibilities to Colleagues and Society

	• Respect for colleagues and teamwork ethics. • Ethical implications of social media and online interactions. • Public engagement and outreach in engineering.
Week 13	Ethical Issues in Engineering Management • Ethical challenges in project management. • Ethical responsibilities of engineering managers. • Corporate social responsibility and ethical business practices.
Week 14	Professional Development and Ethical Awareness • Lifelong learning and ethical competence. • Continuing education and professional ethics. • Ethical challenges in a rapidly changing technological landscape.
Week 15	Case Studies and Ethical Reflection • Analysis of real-world engineering ethics case studies. • Ethical reflection and self-assessment. • Final project or examination on engineering ethics principles and applications.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	C. E. C. E. Harris Jr., M. S. Pritchard, and M. J. Rabins, "Engineering Ethics: Concepts and Cases," Cengage Learning, 2018. [Online]. Available: ISBN: 978-1305500846.	Yes
Recommended Texts	M. W. Martin and R. Schinzinger, "Ethics in Engineering," McGraw-Hill Education, 2016. [Online]. Available: ISBN: 978-0078112481.	No
Websites	The Collage E-Library	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title

Fiber Optics Communication

Module Delivery

Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET4201		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	8
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims	134. In this course, the students can acquire the basic knowledge of Optical Communication Systems 135. Optical Communication Media 136. Fiber optics communication principles and their application.
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	137. Students will be learned about high-speed single-mode and low-speed multimode fiber, 138. Students can acquire knowledge of step and graded refractive index profiles, different dispersion mechanisms and their effect on high-speed links, 139. The advantage of coherent (LASER) light sources over incoherent (LED) sources for the long haul, high-speed links, and photodetectors.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	116. Discuss Laser Principles , operation , structures , applications 117. Describe Photodiodes 118. Explain the Optical Communication Media 119. Identify optical fiber waveguides 120. Explain the of optical fiber communication 121. Describe Transmission characteristics of optical fibers 122. Discuss Optical Transmitters - transmitter types , design 123. Explain Optical Amplifiers
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Basic Concepts of Optical Communication Systems (6 hr) Light Emitting Diodes (6 hr) Photodiodes (6 hr) Optical Communication Media (12 hr) Transmission characteristics of optical fibers (12 hr) Optical Fiber waveguides, couplers and connectors (12hr) Optical Transmitters (8 hr) Optical receivers (8 hr) Optical Amplifiers (4 hr)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Skills competency is important as theory knowledge, especially in vocational and technical education. Thus, the aim of this module is to develop the students
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conceptual knowledge and skills in optical fiber communication to equip the students with the necessary skills to become competent and skillful Technologists. lecture and seminars will be used to explain the theory and principles of the module. Also, laboratory reports and mini-projects will be used. Quantitative instruments such as pre-test and post-test will be used to check students' conceptual knowledge of electrical measurement after the theory lecture or laboratories work. Video will be used to explain the electrical measurement instruments. Observation form and laboratory rubric will be used to analyze the skills of the students. The observer comments from the laboratory staff on student skills will be classified according to thematic analysis to evaluate students learned skills.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Basic Concepts of Optical Communication Systems
Week 2	Light Behavior
Week 3	Laser Principles
Week 4	Light Emitting Diodes (LEDs) - principle of operation , structures , applications
Week 5	Laser Diodes LDs- principle of operation , structures , applications
Week 6	Photodiodes - (pin Photodiode , Avalanche Photodiode , comparisons of photodetectors
Week 7	Mid-term Exam
Week 8	Optical Communication Media- Overview of optical communication media, free space optical communication, optical fiber waveguides.
Week 9	Overview of optical fiber communication- general system, advantages, disadvantages, and applications of optical fiber communication
Week 10	optical fiber waveguides, Ray theory, cylindrical fiber, single mode fiber, multi-mode fiber, cutoff wavelength, mode field diameter
Week 11	Transmission characteristics of optical fibers- Attenuation, absorption, scattering losses, bending loss, dispersion
Week 12	Fiber couplers and connectors
Week 13	Optical Transmitters - transmitter types , design
Week 14	Optical Receivers - receivers types , design
Week 15	Optical Amplifiers

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Fiber Optics
Week 2	Lab 2: Fiber Cleaving
Week 3	Lab 3: Numerical Aperture of a Fiber
Week 4	Lab 4: Coupling into Fiber
Week 5	Lab 5: Profile of Fundamental Mode
Week 6	Lab 6: High-Order Modes in Fiber
Week 7	Lab 7: Mid-term Exam
Week 8	Lab 8: Coupling and Propagation Loss - i
Week 9	Lab 9: Coupling and Propagation Loss - ii

Week 10	Lab 10: Analog Communication Link - i
Week 11	Lab 11: Analog Communication Link – ii
Week 12	Lab 12: Digital Communication Link - i
Week 13	Lab 13: Digital Communication Link - ii
Week 14	Lab 14: A preparatory week before the Final Exam
Week 15	Lab 15: Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Optical Communications Essentials, Gerd Keiser, The McGraw-Hill Companies. Optical Fiber Communication – Gerd Keiser, 4th Ed., MGH, 2008.	Yes
Recommended Texts	Handbook of Laser Technology and Applications , Colin E. Webb, Julian D. C. Jones CRC Press	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Advanced Computer Technology			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET4202				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		4	Semester of Delivery		8
Administering Department		CET	College	EETC	
Module Leader			e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		29/10/2023	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 Aims أهداف المادة الدراسية	The course aims to provide students information about : 1. The μ P and its architecture and the addressing modes 2. Paging mechanism, Segment translation and Page translation 3 Cache memory, Cache organization, fully associative, Direct mapped and Set associative 4. Cache memory used for 80386 - Direct Maps - Two-way set associative 5. Intel's Pentium and its Features 6. Pentium pro, Out of order execution 7. other Pentium processors, Core processor
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- an ability to apply knowledge of microprocessor Architecture. (High) 2- an ability to apply knowledge about 80386 The μ P (High) 3- an ability to apply knowledge about Paging mechanism, Segment translation and Page translation (High) 4- an ability to identify and calculate the addressing mode and physical address (High) 5- an ability to calculate the data and tag for cache (High)
Indicative Contents المحتويات الإرشادية	-Introduction to the Microprocessor and Computer (5 hr) -The μ P 80386 architecture (14 hr) -Protected mode memory addressing (10hr) -Descriptor and page table entries(10 hr)

	-Memory paging(10 hr) -Paging mechanism(5 hr) -A translation lookaside buffer (TLB) (10hr) -Cache memory(10 hr) -Intel's Pentium(5 hr)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Quizzes	2	10% (10)	5, 10	LO #1,2, LO#3,4

Formative assessment	Assignments	2	10% (10)	2, 12	LO #1,2, LO#3,4
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 1-4
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-3
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the Microprocessor and Computer
Week 2	The μ_p 80x86 and its architecture Internal organization of μ_p 80x86
Week 3-4	The μ_p 80386 architecture - Addressing mode - Assembly language Memory segmentation
Week 5-6	Protected mode memory addressing - Selectors and descriptors - Local and global descriptors tables
Week 7	Descriptor and page table entries - Program-invisible registers - Illustrating local memory access. Examples
Week 8	Midterm Exam
Week 9	Memory paging Virtual memory
Week 10	Paging mechanism - Segment translation - Page translation
Week 11	A translation lookaside buffer (TLB) Examples
Week 12	Major changes in the 80386 μ_p
Week 13	Cache memory

	• Cache organization • Fully associative • Direct mapped • Set associative
Week 14	Cache memory used for 80386 • Direct Maps • Two-way set associative
Week 15	Intel's Pentium • Features of the Pentium • Intel's overdrive technology

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Mp 80386
Week 2	Lab 2: programming using assembly language
Week 3	Lab 3: programming many functions
Week 4	Lab 4: programming many functions using Assembly Language
Week 5	Lab 5: Examples
Week 6	Lab 6: Examples
Week 7	Lab 7: Examples

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	The 80x86 IBM Pc and compatible computer	Yes
Recommended Texts		No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Network Security & Cybersecurity		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET4203			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level		4	Semester of Delivery	8
Administering Department		CET	College	EETC

Module Leader	Dr. Mohammed Joudah	e-mail	mjzaiter@mtu.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Asst. Prof. Omar Nameer Mohammed Salim	e-mail	Omar Nameer Mohammed Salim
Peer Reviewer Name	Dr. Mahmoud Shuker Mahmoud	e-mail	mahmoud.shukur@mtu.edu.iq
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	Upon completion of this course you will have acquired the following knowledge: 140. Understand hacking techniques. 141. Understand the fundamentals of secure network design. 142. Understand the issues involved with providing secure networks. 143. Understand underlying cryptography required for secure communications, authorization and 144. authorization. 145. Obtain hands on experience in cryptography and network security through laboratory work
Module Learning Outcomes	124. Students will be able to explain security principles. 125. Develop Concept of Security needed in Communication of data through computers and networks along with Various Possible Attacks. 126. Understand Various Encryption mechanisms for secure

مخرجات التعلم للمادة الدراسية	transmission of data and management of key required for required for encryption. 127. Students will be able to evaluate risks faced by computer systems and how various attacks work. 128. Students will be able to explain how various security mechanisms work, and correlate these security mechanisms with security principles. 129. Students will be able to compare various security mechanisms and articulate their advantages and limitations. 130. Understand authentication requirements and study various authentication mechanisms. 131. Understand network security concepts and study different Web security mechanisms. 132. Students will be able to create cybersecurity policies and procedures to help 133. secure a medium-sized organization's information technology infrastructure. 134. Students will understand the latest techniques hackers employ to test out cyber defenses. 135. Students will analyze the mission and strategy of the Iraq government agencies who protect our portion of the Internet. 136. Students will discuss hypothetical issues of cyber security with other students in the group Discussions format.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Security Concepts Overview</u> Difference types of attacks; the reasons for protecting the personal information and commercially sensitive information; the types of encryptions; the advantages and limitations of encryption such as symmetric key and asymmetric key. [15 hrs] <u>Security for Malware and Wearable Devices</u> Definition and function of malware; types of malware; mobile malware; app security; Android/iOS security model; how anti-virus software works and its limitations. [15hrs]

	<u>Network Security</u> Difference types of network; the function and limitations of a firewall; Different types of wireless security (i.e. WEP and WPA2); access control. [15 hrs] <u>Web Security</u> Digital certificate; one-time password; appropriate settings of cookies; protect private data in browsers; types of content-control software. [15 hrs] <u>Communications</u> Encrypting and decrypting an e-mail; digital signature; unsolicited e-mail; phishing; backdoor access in instant messaging. [15 hrs] <u>Secure Data Management</u> Physical security; backup procedures; data destruction utilities. [14 hrs]
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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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction, Symmetric Ciphers model: plaintext, encryption algorithm, secret key, cipher text, decryption algorithm.
Week 2	Model of Conventional Encryption and Cryptography Classification.
Week 3	Affine Cipher and Polyalphabetic algorithm (Vigenere cipher).
Week 4	Cryptanalysis of a Symmetric key.
Week 5	Hill cipher and Play fair cipher. Stream Cipher
Week 6	Mid-term Exam
Week 7	Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	DES—The Data Encryption Standard, hers -16 round.
Week 9	Public-Key Algorithms, - RSA.
Week 10	Diffie Hellman Algorithm.
Week 11	Elgamal Algorithm.
Week 12	Cyber Security Tools
Week 13	Web Security.
Week 14	Email Security.

Week 15	PGP—Pretty Good Privacy and S/MIME.
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Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Material Covered

Week 1

Lab 1: Implement the following SUBSTITUTION & TRANSPOSITION TECHNIQUES concepts:

- a) Caesar Cipher
- b) Playfair Cipher

Week 2

Lab 2: Implement the following algorithm :

- a) Hill Cipher
- b) Vigenere Cipher

Week 3

Lab 3: Implement the RSA Algorithm.

Week 4

Lab 4: Implement the DES Algorithm.

Week 5

Lab 5: Implement the Hash function SHA-1 Algorithm.

Week 6

Lab 6: Implement the SIGNATURE SCHEME - Digital Signature Standard.

Week 7

Lab 7: Demonstrate intrusion detection system (ids) using any tool (snort or any other s/w).

Learning and Teaching Resources

مصادر التعلم والتدريس

Text

Available in the Library?

Required Texts

Stallings, W. (2016). Cryptography and network security: principles and practice (Eighth edition.). Pearson

No

Recommended Texts

Speciner, M. et al. (2002). Network security: Private communication in a public world. (Second edition.).

No

Websites

https://www.youtube.com/watch?v=0UMeUB1PIRo&list=RDCMUcu1lQ7SJU27bRIL6hzr9A&start_radio=1&rv=0UMeUB1PIRo&t=8

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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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Cloud Computing	Module Delivery	
Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CET4204		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	8
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims	146. To define the concept of hosting
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أهداف المادة الدراسية	147. To introduce the cloud-computing paradigm 148. To simplify the transition from bare-metal servers thinking to a cloud-native approach. 149. To foster the automation and orchestration concepts. 150. To design, build and manage private clouds.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	137. Classify cloud hosting types. 138. Describe the data center infrastructure. 139. Utilization of virtual machines 140. Transition into virtual networking. 141. Management of cloud infrastructure. 142. Comprehension of cloud-storage 143. Correct utilization of micro-services. 144. Proper use of rate-limiting concepts. 145. Understanding the concept of security. 146. Understanding the concept of privacy. 147. Capability to diagnose bottlenecks in cloud-based systems. 148. Proper application of concepts of elasticity in production systems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: -Cloud Computing History – Power wall, Cloud Computing physical component and organization, cloud computing services. [5 hr.s] -Cloud Computing types – Private and Public Cloud, Hybrid and Multi-Cloud, Hyperscale's, and Cloud server selection. [5 hr.s] -Data Centers – Racks, aisles, Pods, Cloud networking and power management, North-South and East-West Networks, Fat Tree design, leaf-spine scaling. [5 hr.s] -VM and Containers – Virtualization, Hypervisor, Container and Docker software components. [5 hr.s] -Virtual Network and Virtual Storage – Overlays and Underlays, VLANs and VXLANs, SDN and OpenFlow Protocol, Programmable Network. [10 hrs.] -consensus – Need of agreement in cloud-based systems, types, challenges. [10 hrs.]

-Cloud-storage- traditional vs software designed storage. [5 hr.s]

-Microservices- Monolithic Apps in Data Centers, The Microservices Approach: Pros and Cons, Microservices Granularity, Communication Protocols for Microservices, Service Mesh Proxy, Microservices Technologies. [5 hr.s]

-Serverless Computing – The serverless Computing Approach, Stateless Servers and Containers, Serverless Infrastructure, an Example of Serverless Processing. [10 hr.s]

-Edge Computing and IoT - The Latency Disadvantage of Cloud, Low Latency Needs, Extending Edge to A Fog Hierarchy, Multi-level Caching, Edge computing and IIoT, Communication of IIoT, Decentralization. [10 hr.s]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

The main strategy that will be adopted in delivering this module focuses on fostering active student engagement during exercises, fostering the development of critical thinking skills, and encouraging participation. This will be accomplished through a combination of classroom instruction, interactive tutorials, and the inclusion of engaging experiments that involve sampling activities that capture students' interest. The aim is to refine and enhance students' critical thinking abilities while ensuring their active involvement in the learning process.

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem)	61	Unstructured SWL (h/w)	4.06

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The Era of Cloud Computing: The Motivations for Cloud, Power wall, Racks of Server Computer, Elastic Computing, Multi-tenant Clouds, IaaS, PaaS, SaaS, and DaaS.
Week 2	Types of Clouds and its Providers: Private and Public Cloud, Provider Lock-in, Hybrid Cloud, Multi-Cloud, Hyperscale.
Week 3	Data Center Infrastructure and Equipment: Racks, Aisles, and Pods, Power and Cooling, Network Equipment, North-South and East-West Network Traffic, Fat tree Design, leaf spine scaling, Unified Data Centers Network.
Week 4	Virtual Machines and Containers: Approaches To virtualization, Properties of Virtualization, Level of Trust and I/O devices, VM Migration, Hypervisor. Container approach, Docker Containers, Docker software components.
Week 5	Virtual Networks and Virtual Storage: Virtual Networks, Overlay and Underlays, VLANs, VXLAN, Virtual Network Switch, NAT, Mobility, SDN, The OpenFlow Protocol, Programmable Networks. Local and Remote Storage, NAS, SAN, Object Storage.
Week 6	Consensus: Raft, Paxos, consistency levels, CAP, theorem.
Week 7	Software : Cloud native vs. Conventional Software, Parallel Processing, MapReduce Programming Paradigm, Math of MapReduce, Apache Hadoop, HDFS, Hadoop support for Programming languages.

Week 8	Microservices: Monolithic Apps in Data Centers, The Microservices Approach: Pros and Cons, Microservices Granularity, Communication Protocols for Microservices, Service Mesh Proxy, Microservices Technologies.
Week 9	Mid-term-1
Week 10	Cloud Storage: File, Object, Database storage systems, Software Defined Storage
Week 11	Serverless Computing and DevOps: The serverless Computing Approach, Stateless Servers and Containers, Serverless Infrastructure, An Example of Serversless Processing. DevOps Approach, Continuous Integration, Continuous Delivery, Cautious Deployment, Sandbox, Canary, and Blue/Green.
Week 12	Edge Computing and IoT: The Latency Disadvantage of Cloud, Low Latency Needs, Extending Edge to A Fog Hierarchy, Multi-level Caching, Edge computing and IIoT, Communication of IIoT, Decentralization.
Week 13	Cloud Security and Privacy: Cloud Security Problems, Traditional Security Methods and its insufficiency with cloud, Zero Trust Security Model, Identity Management, PAM, AI and Security, Protecting Remote Access, Privacy in Cloud, Back Doors, Side Channels.
Week 14	Building Your Own Cloud: Case Study, see TextBook#2
Week 15	Building Your Own SaaS: Case Study, see TextBook#2

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: hosting providers portal mgmt.
Week 2	Lab 2: hosting specs and pricing
Week 3	Lab 3: virtualization software (installation, config)
Week 4	Lab 4-5: VM mgmt.
Week 5	
Week 6	Lab 6: backup, recovery, scaling, up down.
Week 7	Lab 7-8: Proxmox mgmt
Week 8	
Week 9	Lab 9: migration offline, online, hypervisor replacement
Week 10	Lab 10-11-12: docker mgmt
Week 11	
Week 12	
Week 13	Mgmt. tools

**Week 14
& 15**

Virtual appliances

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Textbooks Book#1: Douglas E. Comer, The Cloud Computing Book, The future of Computing Explained, 1st Edition, CRC Press, 2021. Book#2: Ian Foster and Dennis B. Gannon, "Cloud Computing for Science and Engineering", The MIT Press, 2017.	Yes
Recommended Texts		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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	project		Module Delivery	
Module Type	Core		☐ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	CET4205			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	4	Semester of Delivery		8
Administering Department	CET	College	EETC	
Module Leader			e-mail	
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	29/10/2023		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 Aims أهداف المادة الدراسية	
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module focuses on fostering active student engagement during exercises, fostering the development of critical thinking skills, and encouraging participation. This will be accomplished through a combination of classroom instruction, interactive tutorials, and the inclusion of engaging experiments that involve sampling activities that capture students' interest. The aim is to refine and enhance students' critical thinking abilities while ensuring their active involvement in the learning process.
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Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes				
	Assignments				
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam	2 hr	40% (10)	8	
	Final Exam	2hr	60% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	

Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	
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	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14 & 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Recommended Texts		

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Reconfigurable Computing Systems		Module Delivery
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET4206		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims

أهداف المادة الدراسية

1. Understand the fundamentals of the reconfigurable computing and reconfigurable architectures
2. Articulate the design issues involved in reconfigurable computing systems with a specific focus on Field Programmable Gate Arrays (FPGAs) both in theoretical and application levels
3. Understand the performance trade-offs involved in designing a reconfigurable computing platform with a specific focus on the architecture of a configurable logic block and the programmable interconnect
4. Discuss the state-of-the-art reconfigurable computing architectures spanning fine grained (look up table-based processing elements) to coarse grained (arithmetic logic unit level processing elements) architectures.
5. Understand both how to architect reconfigurable systems and how to utilize them for solving challenging computational problems.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

1. an ability to apply knowledge of mathematics, science, and engineering (High)
2. an ability to design and conduct experiments, as well as to analyze and interpret data (High)
3. an ability to design a system, component, or process to meet desired needs within realistic constraints (High)
4. an ability to identify, formulate, and solve engineering problems (High)
5. an ability to communicate effectively (Medium)
6. a recognition of the need for, and an ability to engage in life-long learning (Medium)
7. a knowledge of contemporary issues (High)
8. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. (High)

Indicative Contents

المحتويات الإرشادية

- Introduction to Reconfigurable Computing (5 hr)
- FPGA Architectures(10 hr)
- FPGA Design Cycle (20 hr)
- Coarse-grained Reconfigurable Devices (10 hr)
- Reconfigurable Computing Applications (7 hr)
- Multi-FPGA Systems (5 hr)
- FPGAs vs. Multicore architectures (5 hr)
- Advanced Topics (12 hr)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطالب موزع على (15) اسبوع

Structured SWL (h/sem)

الحمل الدراسي المنتظم للطالب خلال الفصل

64

Structured SWL (h/w)

الحمل الدراسي المنتظم للطالب أسبوعيا

4.26

Unstructured SWL (h/sem)

الحمل الدراسي غير المنتظم للطالب خلال الفصل

61

Unstructured SWL (h/w)

الحمل الدراسي غير المنتظم للطالب أسبوعيا

4.06

Total SWL (h/sem)

الحمل الدراسي الكلي للطالب خلال الفصل

125

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Material Covered

Week 1 Introduction to Reconfigurable Computing

Week 2-3 FPGA Architectures

Week 4-7 FPGA Design Cycle

- Technology-independent optimization
- Technology Mapping
- Placement
- Routing

Week 8 Coarse-grained Reconfigurable Devices

Week 9 Midterm Exam

Week 11 Reconfigurable Computing Applications

Week 12 Multi-FPGA Systems

Week 13 FPGAs vs. Multicore architectures

Week 14-15 Advanced Topics:

- Dynamic Reconfiguration
- Partial Reconfiguration
- 3D FPGAs

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Material Covered

Week 1 Lab 1: Introduction to ISE design suite software

Week 2 Lab 2: VHDL programming tools

Week 3	Lab 3: programming simple VHDL program
Week 4	Lab 4: IF statements -VHDL programs
Week 5	Lab 5: For loop -VHDL programs
Week 6	Lab 6: UP-Down counters
Week 7	Lab 7: Multi functions programs

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	: (Optional) Reconfigurable Computing: The Theory and Practice of FPGA-Based Computation by Scott Hauck, André DeHon.	Yes
Recommended Texts	C. Maxfield, The Design Warrior's Guide to FPGAs, Newnes, 2004, ISBN: 978-0750676045	No
Websites	http://class.ece.iastate.edu/cpre583/	

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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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Wireless Sensor Network		Module Delivery
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET4207		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	4	Semester of Delivery	
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The aim of the course is to provide students with knowledge and skills for wireless network design, operation and testing, equipment configuration, security considerations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course, students will know: 1- Electromagnetic signal specifications IEEE802.11 link layer protocol data rates, media access control and logical link control techniques, quality-of-service and security features 2- Wireless network design principles. 3- Perform wireless signal planning and strength measurement. 4- Design wireless network with optimal performance. 5- Plugin and configure wireless network equipment. 6- Build large wireless network with centralized control. 7- Configure wireless network security 8- The necessary skills to design, configure and operate production-grade wireless network.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Introduction</u> Introduction to WSNs, Wireless technology history, modern wireless networks, Advantages, Challenge vs Ad-hoc network. [25 hrs] <u>Part B – Architecture</u> Network architecture, node architecture, types of networks based on its topology, data transfer on media. [25 hrs]

Part C – Wi-Fi Protocols

IEEE 802.11 (Wi-Fi) protocol design. Wi-Fi physical layer, Wi-Fi data-link layer, Wi-Fi logical link control layer, Wi-Fi quality-of-service (QoS) features, Wi-Fi security features [25 hrs]

Learning and Teaching Strategies**استراتيجيات التعلم والتعليم****Strategies**

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

Student Workload (SWL)**الحمل الدراسي للطالب موزع على (15) اسبوع**

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation**تقييم المادة الدراسية**

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Quizzes	2	10% (10)	4, 12	LO #1-3, LO#3-7

Formative assessment	Assignments	2	10% (10)	5, 12	LO #1-3, LO#4-7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 1-8
Summative assessment	Midterm Exam	2 hr	10% (10)	9	LO # 1-4
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1- 2	Course introduction, wireless network introduction. Wireless technology history, modern wireless networks
Week 3-4	Data transfer over wireless media. Electromagnetic waves propagation. Wireless equipment and EM waves specifications. Data modulation and coding schemes, data decoding.
Week 5-6	IEEE 802.11 (Wi-Fi) protocol design. Wi-Fi physical layer: EM signal specifications, data rates, data modulation and coding schemes.
Week 7-8	Wi-Fi data-link layer: data frame structure, media access control, wireless nodes addressing, error detection/correction.
Week 9	Midterm Exam
Week 10	Wi-Fi logical link control layer: data frame types, control and management frames, multiple network coexistence. Wireless network with multiple access points, roaming.
Week 11-12	Wi-Fi logical link control layer: data frame types, control and management frames, multiple network coexistence. Wireless network with multiple access points, roaming.
Week 13	Wi-Fi security features. 802.1x protocol, WPA/2/3 operation. Network infrastructure security.
Week 14	Wi-Fi centralized architecture. Wireless controller configuration/operation
Week 15	Decentralized Wi-Fi networks (Ad-Hoc, Mesh-type). Introduction to sensor networks. Bluetooth basics

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Node construction.
Week 2	Lab 2: WSNs Topologies.
Week 3	Lab 3: IEEE 802.11 design.
Week 4	Lab 4: Wi-Fi logical link.
Week 5	Lab 5: Wi-Fi quality-of-service measurements.
Week 6	Lab 6: WSNs based on 802.1x protocol.
Week 7	Lab 7: Configuring peer-to-peer network (Wi-Fi Ad-Hoc mode or Bluetooth).

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Wireless Sensor Network, Leonidas J. Guibas, The Morgan Kaufmann Series in Networking, Elsevier, NEW YORK	Yes
Recommended Texts	Kazem Sohraby, Daniel Minoli and Taieb Znati, “Wireless Sensor Networks Technology, Protocols, and Applications”, John Wiley & Sons, 2007.	No
Websites	https://kanchiuniv.ac.in/coursematerials/ECE_COURSE_MATERIAL_ODD%20SEMESTER/ECE_COURSE%20MATERIAL_ODD%20SEMESTER/Dr.S.Omkumar_Wireless%20Sensor%20Networks.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
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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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Optimization Algorithms	Module Delivery
Module Type	Elective	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	CET4208	
ECTS Credits	5	
SWL (hr/sem)	125	

Module Level	4	Semester of Delivery	8
Administering Department	CET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	29/10/2023	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 Aims أهداف المادة الدراسية	1- Provides students with an introduction to optimization techniques and genetic algorithms. 2- Students will learn about various optimization problems, including linear and nonlinear optimization. 3- Explore the principles and applications of genetic algorithms. 4- Cover the fundamental concepts, algorithmic implementations, and practical considerations for solving optimization problems using genetic algorithms. 5- Students will gain hands-on experience through programming assignments and project work.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the fundamental concepts and principles of optimization techniques. 2- Explain the different types of optimization problems, including linear programming, nonlinear programming, and combinatorial optimization. 3- Evolutionary Algorithms, Swarm Intelligence Algorithms.

	4- Understand the principles and workings of genetic algorithms. 5- Advantages and disadvantages of Genetic algorithms. 6- Population, selection, crossover, and mutation algorithms 7- Design and implement genetic algorithms to solve optimization problems. 8- Analyze and compare the performance of different optimization algorithms. 9- Evaluate and select suitable optimization algorithms for specific problem domains. 10- Implement optimization algorithms using programming languages and libraries commonly used in the field. 11- Analyze and interpret the results obtained from optimization algorithms. 12- Apply optimization techniques to real-world applications in various domains.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- Introduction to Optimization [5 hrs] Optimization problems and their classifications; Linear programming and integer programming; Nonlinear Optimization. 2- Evolutionary Computation [5 hrs] Introduction to evolutionary computation; Swarm Intelligence Algorithms; Principles of genetic algorithms, advantages, and disadvantages. 3- Genetic Algorithm Components [5 hrs] Representation and encoding of solutions; Selection, crossover, and mutation operators. 4- Genetic Algorithm Operators and Strategies [25 hrs] Tournament selection, roulette wheel selection, and rank-based selection; Single-point crossover, uniform crossover, and arithmetic crossover; Mutation techniques and their impact on exploration and exploitation 5- Genetic Algorithm Variants and Extensions [10 hrs] Elitism and population size selection; Adaptive and dynamic parameter settings 6- Applications of Optimization and Genetic Algorithms [10 hrs]

	Optimization in engineering, operations research, and finance; Applications in scheduling, routing, and resource allocation; Real-world case studies and examples
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 موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 14	LO #1-3 and 4-9
	Assessment	2	10% (10)	4, 10	LO #1-3 and 4-8
	Projects / Lab.	1	10% (10)	Continuous	All
	Seminar	1	10% (10)	Continuous	All
Summative assessment	Midterm Exam	2 hr	10% (10)	9	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Material Covered

Week 1	Introduction to optimization algorithms
Week 2,3	Nature-inspired Optimization Techniques
Week 4,5	Evolutionary Algorithms, Swarm Intelligence Algorithms
Week 6	Introduction to Genetic Algorithm
Week 7	Advantages and disadvantages of Genetic algorithms
Week 8	Type of operators, population, selection, crossover, crossover rate, mutation, mutation rate
Week 9	Mid Term Exam
Week 10,11	Population, selection, crossover, and mutation algorithms
Week 12,13	Applications of genetic algorithms
Week 14,15	Introduction to Particle swarm optimization (PSO)

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Material Covered

Week 1	Introduction to MATLAB: m file
Week 2	Benchmark functions
Week 3	The initial population of the genetic algorithm
Week 4	candidate solutions based on dimension and population
Week 5	Population Movement
Week 6	Genetic algorithm implementation
Week 7	The real application of the genetic algorithm

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Introduction to Genetic Algorithms" by Melanie Mitchell.	No

Recommended Texts	"Introduction to the Theory of Optimization" by J.E. Dennis Jr. and Robert B. Schnabel.	No
Websites	https://www.coursera.org	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
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8. Information contact:

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