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

دليل وصف البرنامج الأكاديمي والمقرر

٢٠٢٤

المقدمة:

يُعد البرنامج التعليمي بمثابة حزمة منسقة ومنظمة من المقررات الدراسية التي تشتمل على إجراءات وخبرات تنظم بشكل مفردات دراسية الغرض الأساس منها بناء وصقل مهارات الخريجين مما يجعلهم مؤهلين لتلبية متطلبات سوق العمل يتم مراجعته وتقييمه سنوياً عبر إجراءات وبرامج التدقيق الداخلي أو الخارجي مثل برنامج الممتحن الخارجي.

يقدم وصف البرنامج الأكاديمي ملخص موجز للسمات الرئيسة للبرنامج ومقرراته مبيناً المهارات التي يتم العمل على اكسابها للطلبة مبنية على وفق اهداف البرنامج الأكاديمي وتتجلى أهمية هذا الوصف لكونه يمثل الحجر الأساس في الحصول على الاعتماد البرامجي ويشترك في كتابته الملاكات التدريسية بإشراف اللجان العلمية في الأقسام العلمية.

ويتضمن هذا الدليل بنسخته الثانية وصفاً للبرنامج الأكاديمي بعد تحديث مفردات وفقرات الدليل السابق في ضوء مستجدات وتطورات النظام التعليمي في العراق والذي تضمن وصف البرنامج الأكاديمي بشكلها التقليدي نظام (سنوي، فصلي) فضلاً عن اعتماد وصف البرنامج الأكاديمي المعمم بموجب كتاب دائرة الدراسات ت م٢٩٠٦/٣ في ٢٠٢٣/٥/٣ فيما يخص البرامج التي تعتمد مسار بولونيا أساساً لعملها.

وفي هذا المجال لا يسعنا إلا أن نؤكد على أهمية كتابة وصف البرامج الاكاديمية والمقررات الدراسية لضمان حسن سير العملية التعليمية.

مفاهيم ومصطلحات:

وصف البرنامج الأكاديمي: يوفر وصف البرنامج الأكاديمي ايجازاً مقتضباً لرؤيته ورسالته وأهدافه متضمناً وصفاً دقيقاً لمخرجات التعلم المستهدفة على وفق استراتيجيات تعلم محددة.

وصف المقرر: يوفر إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهناً عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ويكون مشتق من وصف البرنامج.

رؤية البرنامج: صورة طموحة لمستقبل البرنامج الأكاديمي ليكون برنامجاً متطوراً وملهماً ومحفزاً وواقعياً وقابلاً للتطبيق.

رسالة البرنامج: توضح الأهداف والأنشطة اللازمة لتحقيقها بشكل موجز كما يحدد مسارات تطور البرنامج واتجاهاته.

اهداف البرنامج: هي عبارات تصف ما ينوي البرنامج الأكاديمي تحقيقه خلال فترة زمنية محددة وتكون قابلة للقياس والملاحظة.

هيكلية المنهج: كافة المقررات الدراسية / المواد الدراسية التي يتضمنها البرنامج الأكاديمي على وفق نظام التعلم المعتمد (فصلي، سنوي، مسار بولونيا) سواء كانت متطلب (وزارة، جامعة، كلية وقسم علمي) مع عدد الوحدات الدراسية.

مخرجات التعلم: مجموعة متوافقة من المعارف والمهارات والقيم التي اكتسبها الطالب بعد انتهاء البرنامج الأكاديمي بنجاح ويجب أن يُحدد مخرجات التعلم لكل مقرر بالشكل الذي يحقق اهداف البرنامج.

استراتيجيات التعليم والتعلم: بأنها الاستراتيجيات المستخدمة من قبل عضو هيئة التدريس لتطوير تعليم وتعلم الطالب وهي خطط يتم إتباعها للوصول إلى أهداف التعلم. أي تصف جميع الأنشطة الصفية واللاصفية لتحقيق نتائج التعلم للبرنامج.

نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة .....واسط.....

الكلية/ المعهد: كلية .....الهندسة.....

القسم العلمي: قسم .....الهندسة الكهربائية

اسم البرنامج الأكاديمي او المهني: بكالوريوس ..هندسة كهربائية

اسم الشهادة النهائية: بكالوريوس في ....الهندسة الكهربائية

النظام الدراسي:

تاريخ اعداد الوصف: 1 \ 9 \ 2024

تاريخ ملء الملف: 4 \ 9 \ 2024

التوقيع :

اسم رئيس القسم: أ.م.د. إسماعيل شرهان باقر

التاريخ : 5 \ 9 \ 2024

التوقيع :

اسم المعاون العلمي: أ.م.د. حسين رزاق صباح

التاريخ : 5 \ 9 \ 2024

دقـــق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: أ.م.د. حيدر ماجد حسن

التاريخ 5 \ 9 \ 2024

التوقيع

مصادقة السيد العميد

أ.د.علي ناصر حلو

5 \ 9 \ 2024

1. رؤية البرنامج

إن رؤية قسم الهندسة الكهربائية في جامعة واسط هي أن يصبح القسم متميزاً بين الاقسام العلمية المناظرة على المستوى الدولي وان تكون له الريادة على المستويين المحلي والعالمي في مجالات الهندسة الكهربائية وتطبيقاتها وكذلك المشاركة مع الجهات المجتمعية بصورة فاعلة.

2. رسالة البرنامج

إن رسالة قسم الهندسة الكهربائية في جامعة واسط هي تحقيق احتياجات المجتمع المحلي الكادر الهندسي وتقديم برامج عالية الجودة في مجال التعليم العالي والبحث العلمي.

3. اهداف البرنامج

يهدف البرنامج الى جملة من النقاط منها على سبيل المثال:

1. تطوير مقدرة الطالب الهندسة على التعامل بمهنية وعلمية كافية لحل المسائل الخاصة بمختلف مجالات الهندسة كهربائية مهما كانت معقدة حيث يهدف البرنامج بداية لتعريف طالب الهندسة الكهربائية بمبادئ عمل وتصميم أجهزة القياس والتحليل المختلفة.
2. وكذلك تصميم أنظمة التشغيل الخاصة بهذه الأجهزة وكيفية الاستفادة منها لاجراء الأبحاث العلمية للارتقاء بالمستوى العلمي.
3. العمل على تلبية احتياجات سوق العمل من هذه الخبرات العلمية اسهاما في إعداد الكفاءات الوطنية المؤهلة بحثياً وعلمياً.
4. بناء شخصية سليمة لطالب الهندسة من خلال الأنشطة المختلفة تساعده على الإبداع في حياته العملية.
5. تشجيع الكفاءات المؤهلة علمياً للاستمرار ومواصلة دراستهم في برامج الماجستير وغيرها

4. الاعتماد البرامجي

لا يوجد

5. المؤثرات الخارجية الأخرى

لا يوجد

6. هيكلية البرنامج				
هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات *
متطلبات المؤسسة	8	%3	%3	
متطلبات الكلية	8	%3	%3	
متطلبات القسم	50	232	%96	
التدريب الصيفي	–	–	–	–
أخرى				

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

7. وصف البرنامج				
السنة / المستوى	رمز المقرر أو المساق	اسم المقرر أو المساق	الساعات المعتمدة	

8. مخرجات التعلم المتوقعة للبرنامج	
المعرفة	
- مواكبة تطور اساسيات الهندسة الكهربائية -- التواصل مع كل ما هو جديد في مجال الهندسة الكهربائية	
المهارات	
القيم	

تنمية قدرات الطلبة على مشاركة الأفكار	

9. استراتيجيات التعليم والتعلم
-شرح المادة العلمية للطلاب بشكل تفصيلي. 2- مشاركة الطلاب في حل المسائل الهندسية 3- مناقشة وحوار حول مفردات متعلقة بالموضوع

10. طرائق التقييم
الامتحانات الأسبوعية والشهرية واليومية وامتحان نهاية السنة.

11. الهيئة التدريسية

أعضاء هيئة التدريس

الرتبة العلمية		التخصص		المتطلبات/المهارات الخاصة (ان وجدت)		اعداد الهيئة التدريسية	
		عام	خاص			ملاك	محاضر
أ.د	مؤيد ساجت	حاسبات	أنظمة مدمجة			نعم	
م م	اسعد علي	كهرباء	كهرباء عام			نعم	
م.م	فراس ناجي	كيمياء	مواد			نعم	
م.م	ابتهال رزاق	كهرباء	كهرباء عام			نعم	
م.م	مها أكرم	كهرباء	كهرباء عام			نعم	
م.م	نبراس حازم	كهرباء	كهرباء عام			نعم	

م	علي خلف	كهرباء	كهرباء عام			نعم	
م د	سمير فالح	ميكانيك	مواد			نعم	
م م	احمد عبد الامير	كهرباء	كهرباء عام			نعم	
م.م	نور صباح	كهرباء	كهرباء عام			نعم	
أ.م.د	محمد عبد الخبير	ميكانيك	تطبيقية			نعم	
م.م	احمد ستار	حاسبات	معلوماتية			نعم	
م.د	سالم محمد	حاسبات	معلوماتية			نعم	
م.م	نهى عدنان	كهرباء	كهرباء عام			نعم	
م.م	زهراء حسن	كهرباء	كهرباء عام			نعم	
أ.م.د	مناف كاظم	الكترونيك	أجهزة طبية			نعم	
م.م	همام منعم	كهرباء	كهرباء عام			نعم	
م	فيصل ذياب	كهرباء	قدرة			نعم	
م.د	أمجد يوسف	كهرباء	اتصالات			نعم	
م.د	رياض عبدربه	كهرباء	الكترونيك			نعم	
م.م	صفا نوري	كهرباء	كهرباء عام			نعم	
أ.د	حسن فهد	كهرباء	كهرباء عام			نعم	
م.م	نسرين خليل	كهرباء	كهرباء عام			نعم	
م م	دعاء علي	كهرباء	كهرباء عام			نعم	
أ.م.د	اسماعيل شرهان	كهرباء	اتصالات			نعم	
م.د	باسم خلف	كهرباء	اتصالات			نعم	
أ.م	حيدر ذياب	كهرباء	اتصالات			نعم	
م.د	علي أسعد	حاسبات	ذكاء صناعي			نعم	
أ.م	محمد عبد الرضا	كهرباء	قدرة			نعم	

التطوير المهني
توجيه أعضاء هيئة التدريس الجدد
حث الكادر من هيئة التدريس الجدد بضرورة العمل على تطوير المنهج العلمي وطرق القاء المحاضرات وضرورة إيصال المادة العلمية للمتلقي بأسلوب سلس قدر الإمكان.
التطوير المهني لأعضاء هيئة التدريس
حث هيئة التدريس لتطوير الجانب العلمي من خلال تطوير العمل في المختبرات العلمية لدعم هذا الجانب لدى الطلبة هو تخصص علمي.

12. معيار القبول
يقبل قسم الهندسة الكهربائية في جامعة واسط خريجي الدراسة الإعدادية من الفرع العلمي ممن اجتاز الامتحانات العامة بمعدل 80 فأكثر.

13. أهم مصادر المعلومات عن البرنامج
• الكتب المنهجية والمقررة من وزارة التعليم العالي والبحث العلمي. • مواقع الشبكة العالمية حسب توصية الأساتذة الاختصاص. • كتب غير منهجية حسب توصية الأساتذة الاختصاص
14. خطة تطوير البرنامج
هنالك في قسم الهندسة الكهربائية في جامعة واسط وبالتنسيق بين كل من رئاسة القسم ومجلس القسم واللجنة العلمية في القسم خطة لتطوير البرنامج وتوفير المتطلبات اللازمة لهذه العملية سواء كانت من الجانب العملي او النظري.

وصف البرنامج الأكاديمي			
	اسم المقرر	رمز المقرر	الساعات المعتمدة

المرحلة الدراسية			نظري	عملي
المرحلة الأولى \ الفصل الدراسي الاول	**حقوق الإنسان والديمقراطية**	UoWEE12345	2	-
	التقنية الرقمية I	UoWEE12346	1	2
	الرياضيات I	UoWEE12347	3	-
	أساسيات الهندسة الكهربائية I ومختبر I	UoWEE12348	3	2
	فيزياء الالكترونيات	UoWEE12349	3	-
	أساسيات الكمبيوتر والبرمجة	UoWEE12350	1	2
	اللغة العربية I	UoWEE12352	2	2
	المجموع		15	8
المرحلة الأولى \ الفصل الدراسي الثاني	**اللغة الإنجليزية**	UoWEE12353	2	-
	التقنية الرقمية II	UoWEE12354	1	2
	الرياضيات II	UoWEE12355	3	-
	أساسيات الهندسة الكهربائية-II والمختبر-II	UoWEE12356	3	2
	الرسم الهندسي والأوتوكاد	UoWEE12357	3	2
	هندسة ميكانيكي	UoWEE12358	3	-
	برمجة C++ و Matlab	UoWEE12360	3	2
	المجموع		18	8

وصف البرنامج الأكاديمي				
المرحلة الدراسية	اسم المقرر	رمز المقرر	الساعات المعتمدة	
			نظري	عملي
المرحلة الثانية \ الفصل الدراسي الاول	**الرياضيات الهندسية I**	UoWEE12361	3	0
	المجالات الكهرومغناطيسية I	UoWEE12362	2	0
	الدوائر الكهربائية I	UoWEE12363	2	0
	الدوائر الإلكترونية I	UoWEE12364	2	2
	المكائن الكهربائية I	UoWEE12365	2	2
	هندسة الكمبيوتر	UoWEE12366	4	3
	اللغة الانجليزية III	UoWEE12367	1	0
	المجموع		16	7
	الرياضيات الهندسيةII	UoWEE12368	3	0
	المجالات الكهرومغناطيسية II	UoWEE12369	2	0
	الدوائر الكهربائية 2	UoWEE12370	2	0

المرحلة الثانية \ الفصل الدراسي الثاني	**الدوائر الإلكترونية II**	UoWEE12371	2	2
	المكائن الكهربائية II	UoWEE12372	2	2
	الأنظمة المدمجة ووحدة التحكم المنطقية القابلة للبرمجة	UoWEE12373	4	3
	اللغة الانجليزية IV	UoWEE12374	1	0
	المجموع		16	7

مخطط مهارات البرنامج																							
يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم																							
مخرجات التعليم المطلوبة من البرنامج																							
السنة\ المستوى	اسم المقرر	أساسي ام اختياري	الاهداف المعرفية						الأهداف المهاراتية الخاصة بالموضوع				الأهداف الوجدانية والقيمية				المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطوير الشخصي)						
			أ 1	أ 2	أ 3	أ 4	ب 1	ب 2	ب 3	ب 4	ج 1	ج 2	ج 3	ج 4	د 1	د 2	د 3	د 4					
الاول	حقوق الإنسان والديمقراطية	أساسي	+	+	+	+	+	+		+	+	+	+	+	+		+	+					
	التقنية الرقمية	أساسي	+	+	+	+	+	+		+	+	+	+	+	+		+	+					
	الرياضيات	أساسي	+		+	+	+	+		+		+	+	+	+		+	+					
	أساسيات الهندسة الكهربائية	أساسي	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+					
	فيزياء الالكترونيات	أساسي	+	+	+		+	+		+	+	+	+	+	+		+	+					
	أساسيات الكمبيوتر والبرمجة	أساسي	+	+	+	+	+	+		+	+		+	+	+		+	+					
	اللغة العربية	أساسي	+	+	+	+	+	+	+		+	+		+	+		+	+					
	الرسم الهندسي والأوتوكاد	أساسي	+	+	+	+	+	+		+	+	+	+	+	+		+	+					
	هندسة ميكانيكي	أساسي	+	+	+	+	+	+		+	+	+	+	+	+		+	+					
	اللغة الإنجليزية	أساسي	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+					
الثاني	الرياضيات الهندسية	أساسي	+		+	+	+	+		+		+	+	+	+		+	+					
	المجالات الكهرومغناطيسية	أساسي	+	+	+		+	+		+	+	+	+	+	+		+	+					
	الدوائر الكهربائية	أساسي	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+					
	الدوائر الإلكترونية	أساسي	+	+	+	+	+	+		+	+	+	+	+	+		+	+					
	المكائن الكهربائية	أساسي	+	+	+		+	+		+	+	+	+	+	+		+	+					
	هندسة الكمبيوتر	أساسي	+	+	+	+	+	+		+	+		+	+	+		+	+					
	اللغة الإنجليزية	أساسي	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+					
	الأنظمة المدمجة FPGA	أساسي	+	+	+	+	+	+		+	+		+	+	+		+	+					
	التحليل العددي	أساسي	+		+	+	+	+		+		+	+	+	+	+	+	+					

الثالث	**المكائن الكهربائية**	أساسي	+	+	+		+	+	+	+		+	+		+	+	+	
	الالكترونيك	أساسي	+	+	+		+	+	+	+	+	+	+	+	+	+	+	
	نظريات الاتصالات	أساسي	+	+	+		+	+	+	+	+	+		+	+	+	+	
	الهوائيات وانتشار الموجات	أساسي	+	+	+		+	+	+	+		+	+	+	+	+	+	
	أنظمة القوى الكهربائية	أساسي	+	+	+		+	+	+	+	+		+	+	+	+	+	
	اللغة الانجليزية	أساسي	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+
الرابع	**المشروع الهندسي**	أساسي	+		+		+	+		+		+	+	+	+	+	+	
	الإلكترونيك المتقدم	أساسي	+	+	+		+	+	+	+		+	+	+	+	+	+	
	أنظمة السيطرة	أساسي	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+
	الاتصالات الرقمية	أساسي	+	+	+		+	+	+	+	+	+	+		+	+	+	
	قدرة الكترونية	أساسي	+	+	+		+	+	+	+		+	+		+	+	+	
	شبكات الحاسوب	أساسي	+	+	+		+		+	+		+	+	+	+	+	+	
	اللغة الانجليزية	أساسي	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Basics of Electrical Engineering I and Lab I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12348**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems.

	6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **<u>Part A - Circuit Theory</u>** 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, Introduction to mesh and nodal analysis. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs] Revision problem classes [6 hrs] **<u>Part B - Analogue Electronics</u>** Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs]

	Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	112	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation
تقييم المادة الدراسية

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Basic concept and units:** Electricity & atomic structure of substance, current and current density current flow.
Week 2	Electric circuit, E.M.F & potential difference, international system of unit, abbreviation for multiples & sub- multiples.
Week 3	Quantities derived from SI units, units of force-energy-torque and power
Week 4	Relation between energy and heat, electric units, specific heat capacity.
Week 5	Efficiency and percentage efficiency, electromechanical equivalent of element.
Week 6	**Analysis of D.C circuits**: Ohms law, resistivity & conductivity, temperature effect, internal resistance of a source, open circuit & short circuit, equivalent resistance.
Week 7	Series – parallel – Series- parallel – delta and star connections, equivalent voltage source.
Week 8	Series – parallel – circulating current method, floating source method & grouping of E.M.F sources, double subscript, power calculation in D.C circuit, introduction to network theorems, types of sources
Week 9	Independent and dependent voltage and their transformation, Kirchhoff's laws, KVL –KCL.
Week 10	Maxwell's circulating current (mesh analysis), nodal analysis, superposition theorem, Thevenin's theorem, Norton's theorem.
Week 11	Maximum power transfer theorem, Mill man's theorem, substitution theorem, reciprocity theorem.
Week 12	**Alternation quantities:** Magnetic fields, magnetic fields due to electric current, magnetic fields in a coil, force in current carrying conductor across a magnetic field, left hand rule.
Week 13	Magnitude of the force, electromagnetic induction, Faraday 's law, right hand rule, magnitude of induced e.m.f magnitude of e.m.f in a coil.
Week 14	Generation of single-phase voltage, waveforms – instantaneous value and real value, relation between time and angle, max – average & r.m.s values of alternating and sinusoidal voltage and current, form factor and peak factor.
Week 15	Phasor quantities, voltage and current relations in pure resistive inductive and capacitive circuits.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Laboratory procedures and safety Laboratory regulations, laboratory safety practices measurement terms, error precision, resolution, and accuracy.
Week 2	Lab 2: Power supply, digital mustimeter Power supply, digital mustimeter, measuring voltage, measuring current.
Week 3	Lab 3: Resistors and Ohm's law Ohm's law, color codes, nominal value, actual value within tolerance.
Week 4	Lab 4: Kirchhoff's law Kirchhoff's voltage law (KVL), Kirchhoff's current law (KCL).
Week 5	Lab 5: Current and voltage divider rule Series connection, parallel connection, voltage divider rule (VDR), current divider rule (CDR).
Week 6	Lab 6: Equivalent Resistance circuits Series circuits, parallel circuits, series-parallel circuits.
Week 7	Lab 7: Simulation of a D.C. motor, Computer simulation of a D.C. circuit. design of ammeter, voltmeter and ohmmeter Voltage design, full-scale deflection current voltage divider, ammeter design, ohmmeter design, logarithmic scale.

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	**Basics of Electrical Engineering II and Lab II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12356**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	امجد يوسف		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**	Ph.D.	
Module Tutor	امجد يوسف		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems.

	6. To perform mesh and Nodal analysis. 7. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **<u>Part A - Circuit Theory</u>** 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, Introduction to mesh and nodal analysis. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs] Revision problem classes [6 hrs] **<u>Part B - Analogue Electronics</u>** Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs]

	Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	112	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation
تقييم المادة الدراسية

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Introduction to Analysis of single-phase A.C. circuits**
Week 2	**Resistance, reactance and impedance, conductance - susceptance and admittance,**
Week 3	**the phasor diagram series – parallel - and series / parallel circuits, power calculation in A.C. circuits**
Week 4	**power factor & power factor correction.**
Week 5	**Complex number & its application to A.C. circuit:**
Week 6	**Equivalent impedance: Series – parallel – Series/parallel – delta and star connections, introduction to network theorems, Kirchhoff 's law: KVL-KCL, Maxwell 's circulating currents (mesh analysis),**
Week 7	**Nodal analysis, super position theorem, thevenin's theorem, Norton 's theorem, maximum power transfer theorem,**
Week 8	**Mill man's theorem, substitution theorem, reciprocity theorem, power calculation (complex power).**
Week 9	**Resonance: Series resonance: quality factor – selectivity – half power – frequency and bandwidth. Parallel resonance quality factor – selectivity – half power – frequency and bandwidth, Series/ parallel resonance circuits.**
Week 10	**Magnetic circuit:** **Magnetic field, direction of magnetic field, characteristics of lines of magnetic field, magnetic field due to electric current,**
Week 11	**magnetic field in a coil, force in current carrying conductor across a magnetic field, left hand rule, magnitude of the force, electromagnetic induction,**
Week 12	**Faraday 's law, right hand rule, magnitude of induced e.m.f. magnitude of e.m.f. in a coil, mmf a magnetic field strength, Magnetic constants, reluctance, Magnetic leakage and fringing,**
Week 13	**Magnetic factors, Magnetic circuit: Series – parallel and Series/ parallel, Kirchhoff 's laws for magnetic circuit, hysteresis and factors effect on its loop, hysteresis loss and eddy current loss,**
Week 14	**Condition for minimum volume of a permanent magnet, load line of a permanent magnet, force between two magnetic poles, magnetic pull between two iron surfaces.**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1 ; Bridge circuit, balanced circuit, null detector device, Wheatstone bridge, and rheostat.
Week 2	Lab 2: Superposition and Thevenin/Norton theorem
Week 3	Lab 3: maximum power transfer theorem.
Week 4	Lab 4: Oscilloscope and function generator
Week 5	Lab 5: cathode-ray tube, setting up a function generator, measuring time, measuring frequency, measuring amplitude
Week 6	Lab 6: Frequency Domain Analysis Frequency domain,
Week 7	Lab 7: time shift, phase shift, magnitude.
Week 8	Lab 8 Average and R.M.S. value
Week 9	Lab 9 root mean square (r.m.s) value. Average value,
Week 10	Lab 10 Sinusoidal A. C. analysis
Week 11	Lab 11 Equation for sinusoidal current
Week 12	Lab 12 angular frequency, phase angle.
Week 13	Lab 13 Maximum power transfer in A.C. circuit.
Week 14	Lab 14 Maximum power transfer, ideal voltage source, gain.

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	**C++ & MATLAB Programming**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12360**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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	To understand C++ & MATLAB languages and main structure for C++ MATLAB programs. Data type in C++ MATLAB programs and variable. Entering function direct entering.

	• To understand Entering function indirect entering, Arithmetic operation and priority for processing. • To understand If statement, Arithmetic operation (use in condition) , Logic operation (use in condition) (If-else) statement, • To understand If statement entire (switch-case) statement (For-loop) statement, (For-loop) entire loop (while) statement, (Do-while) statement One dimension array , Two dimension array Using string for text, Function main structure Function without return value • To understand Recursively call for function, Function with array Pointer.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Recognize Entering function indirect entering, Arithmetic operation and priority for processing. • Recognize C++ & MATLAB If statement, Arithmetic operation (use in condition) , Logic operation (use in condition) (If-else) statement, • If statement entire (switch-case) statement (For-loop) statement, (For-loop) entire loop (while) statement, One dimension array , Two dimension array Using string for text, Function main structure Function without return value • Recursively call for function, Function with array Pointer.
Indicative Contents المحتويات الإرشادية	Part A – C++ Entering function indirect entering, Arithmetic operation and priority for processing. If statement, Arithmetic operation (use in condition) , Logic operation (use in condition) (If-else) statement, [65 hrs] Part B – Matlab If statement entire (switch-case) statement (For-loop) statement, (For-loop) entire loop (while) statement, (Do-while) statement One dimension array , Two dimension array Using string for text, Function main structure Function without return value Recursively call for function, Function with array Pointer. [60 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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	32	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of Computer component of computer, type of H/W, and S/W
Week 2	What is program and instruction and programming languages?
Week 3	Introduction of C++ & MATLAB languages and main structure for C++ MATLAB programs.
Week 4	Data type in C++ MATLAB programs and variable. Entering function direct entering.
Week 5	Entering function indirect entering. Arithmetic function and <math.h> Arithmetic operation and priority for processing
Week 6	If statement (the condition statement)
Week 7	Arithmetic operation (use in condition)
Week 8	Logic operation (use in condition) (If-else) statement,
Week 9	If statement entire (switch-case) statement (For-loop) statement ,

Week 10	(For-loop) entire loop (while) statement, (Do-while) statement One dimension array ,
Week 11	Two dimension array Using string for text,
Week 12	Function main structure Function without return value
Week 13	Exponential function Recursively call for function,
Week 14	Function with array
Week 15	Pointer, Review
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: C++ environment
Week 3	Lab 3: main structure for C++
Week 4	Lab 4: environment of MATLAB program
Week 5	Lab 5: Arithmetic operation and priority
Week 6	Lab 6: If statement
Week 7	Lab 7: Arithmetic operation
Week 8	Lab 8 Logic operation
Week 9	Lab 9 If statement entire (switch-case)
Week 10	Lab 10 (For-loop) entire loop (while) statement, (Do-while) statement
Week 11	Lab 11 Two dimension array
Week 12	Lab 12 Function main structure
Week 13	Lab 13 Recursively call for function,
Week 14	Lab 14 Function with array
Week 15	Lab 15 Pointer

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Bielajew, Alex F. *Introduction to Computers and Programming using C++ and MATLAB*. Department of	Yes

	Nuclear Engineering and Radiological Sciences, University of Michigan, 2002.	
Recommended Texts	Gschwind, Hans W. *Design of digital computers: an introduction*. Springer-Verlag, 2013.	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	**Digital Techniques I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12346**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	أ.د. مؤيد ستار ساجت علي		**e-mail**	E-mail	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	احمد عبد الامير ناصر حسين		**e-mail**	E-mail	
Peer Reviewer Name		م.د. رياض عبد ربه عباس عمير	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**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	To summarize the design and analysis of modern digital circuits by familiarizing students with modern hierarchy of digital hardware and introducing them the state-of-the-art computer hardware design methodologies.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• To understand the difference between digital and analogue systems/signals. • To learn conversions between various number systems . • To perform arithmetic operations in binary numbers • To learn basic and universal logic functions (NOT, AND, OR, and etc (. • To apply boolean algebra in simplification of logic functions . • To use Karnaugh map for digital function optimization . • To learn programmable logic basics, types, and programming. • To use pin-outs and data-sheets of IC packages to implement digital circuits
Indicative Contents المحتويات الإرشادية	Part A - Statics Theory [20 hrs] Part B – Dynamics. [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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Digital Techniques and Basic Definitions
Week 2	System of numbers and general number formula
Week 3	Binary, octal, decimal & hexadecimal numbers.
Week 4	Numbers base conversion
Week 5	Arithmetic operation in different number systems
Week 6	Complements and binary codes
Week 7	Logic functions
Week 8	Boolean algebra: Basic definitions, basic theorem & properties, Boolean functions
Week 9	Simplification of logic expression by using Boolean algebra
Week 10	Midterm exam
Week 11	Examples of simple logic circuits
Week 12	The Karnaugh Map: SOP Minimization
Week 13	Simple logic circuit designs
Week 14	**Canonical & standard forms digital logic gates**
Week 15	**Error detection circuits**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Basics: lab equipment and rules
Week 2	Lab 1: Basics: lab equipment and rules
Week 3	Lab 2: Basic logic gates by using ICs and VHDL
Week 4	Lab 2: Basic logic gates by using ICs and VHDL
Week 5	Lab 3: Boolean algebra
Week 6	Lab 3: Boolean algebra
Week 7	Midterm exam
Week 8	Lab 4: Simplification of logic functions using Boolean algebra
Week 9	Lab 4: Simplification of logic functions using Boolean algebra
Week 10	Lab 5: Universal gates
Week 11	Lab 5: Universal gates
Week 12	Lab 6: Karnaugh map
Week 13	Lab 6: Karnaugh map
Week 14	Lab 7: Demonstration of projects
Week 15	Review

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Digital Fundamentals, 11th Ed.by Thomas L. Floyd	Yes
Recommended Texts	Digital Design, with an Introduction to the Verilog HDL. 5th Ed. By M. Morris Mano & Michael D. Ciletti.	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	**Digital Techniques II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12354**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	امجد يوسف		**e-mail**	E-mail	
Module Leader's Acad. Title	امجد يوسف		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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	To enable the students to understand and formalize more complex topics in digital electronics design and to introduce the concept of multiple functionality circuits the ability to perform data manipulation and storage utilization.
Module Learning Outcomes	1. To understand the difference between combinational and sequential circuits 2. To perform basic arithmetic operations using combinational circuits 3. To use multiplexers and decoders as function generators 4. To construct simple storage units from basic logic gates

مخرجات التعلم للمادة الدراسية	5. To understand the uses of physical characteristics of electronic devices 6. To perform data movement and manipulation 7. To use flip-flops in the design of simple sequential circuits 8. To use VHDL to realize the designs 9. To implement VHDL designs on FPGA boards
Indicative Contents المحتويات الإرشادية	Class rules: 1- Class and lab attendance is mandatory. 2- Late submission of assignments/project is not allowed. 3- In-person and online lectures are all considered. 4- Quiz/Assignment solutions will be provided via class page. 5- Assignments are submitted through class page only. 6- Students work with their assigned group leader (TA) only. 7- Changing groups is prohibited. Basic combinational circuits 1. Design of half adder. 2. Distinguish between half-adders and full-adders 3. Cascading full-adders to implement multibit ripple binary adders 4. Use the comparator to determine the relationship between binary numbers 5. Use cascaded comparators to compare larger numbers 6. Implement a basic binary decoder, encoder, multiplexer, and demultiplexer 7. Implement BCD-to-7-segment by using decoder 8. Use multiplexers as a function generator 9. Explain the meaning of parity 10. Use parity generators and checkers to detect bit errors in digital systems 11. Describe a simple data communications system 12. basic data storage circuits: 13. Use logic gates to construct basic latches 14. Explain the difference between an S-R latch and a D latch 15. Recognize the difference between a latch and a flip-flop 16. Use propagation delay to design edge detector 17. Explain flip-flops types: J-K, D, and T flip-flops 18. Explain some basic flip-flops applications: frequency division, memory cell, etc. 19. Data movement: 20. Identify the basic forms of data movement in shift registers 21. Explain how serial in/serial out, serial in/parallel out, parallel in/serial out, and 22. parallel in/parallel out shift registers operate 23. Describe how a bidirectional shift register operates 24. Use a shift register as a time-delay device 25. Use a shift register to implement a serial-to-parallel data converter 26. Counter and sequential circuit design: 27. Explain the modulo-n up/down counters 28. Explain the use of state diagram 29. Explain the use of asynchronous inputs to modify state diagram 30. Design of asynchronous counters 31. Design of synchronous counters

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. This in addition to group assignments and mini projects.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	68	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	32	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Adders arithmetic operation
Week 2	Half & full adders & subtractors
Week 3	Binary ripple and cascade adders
Week 4	Decoders, encoders, comparator
Week 5	Multiplexers & DE multiplexers
Week 6	Even and odd party logic and code conversion.
Week 7	Midterm exam

Week 8	Latches: SR, D, etc
Week 9	Master slave FF and edge detector
Week 10	Flip flops (JK, D, T , etc.)
Week 11	Shift registers
Week 12	Asynchronous counters
Week 13	Sequential logic design
Week 14	**Synchronous counters**
Week 15	**Review of lectures**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: implementation of half adder from basic logic gates
Week 2	Lab 2: implementation of full adder from basic logic gates
Week 3	Lab 3: implementation of decoder from basic logic gates
Week 4	Lab 4: implementation of parity checker/generator
Week 5	Lab 5: implementation of full adder by using decoder as a function generator
Week 6	Lab 6: implementation of flip-flops
Week 7	Lab 7: implementation of shift register

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Digital Fundamentals, 11th Ed.by Thomas L. Floyd	Yes
Recommended Texts	Digital Design, with an Introduction to the Verilog HDL. 5thEd. By M. Morris Mano & Michael D. Ciletti.	Yes
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	**Electronic Physics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12349**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	م.د. باسم خلف جار الله سعيد		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**	Ph.D.	
Module Tutor	م.م. نور صباح محمد علي		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 an understanding of Electronic Physics, to understand the principle of Electronic Physics Energy levels and atomic structure: The atom, models, wave nature of light, dual nature of matter, wave function energy-band theory of metals. Insulators and semiconductors. 2. understanding Mobility and conductivity, energy distribution of electrons 3. understanding Semiconductors materials (Si, Ge and compound Semiconductors), Extrinsic Semiconductors, Fermi-level in semiconductor, diffusion and carrier life time, 4. understanding Rectifiers, zener diodes voltage regulators

	5. understanding principle and operation of semiconductor laser, metal electronic ballistics semiconductor diode. 6.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize basic of the Electronic Physics, to understand the principle of Electronic Physics Energy levels and atomic structure: The atom, models, wave nature of light, dual nature of matter, wave function energy-band theory of metals. Insulators and semiconductors. 2. Recognize basic of the Mobility and conductivity, energy distribution of electrons 3. Recognize basic of the Semiconductors materials (Si, Ge and compound Semiconductors), Extrinsic Semiconductors, Fermi-level in semiconductor, diffusion and carrier life time, 4. Recognize basic of the Rectifiers, zener diodes voltage regulators 5. Recognize basic, principle and operation of semiconductor laser, metal electronic ballistics semiconductor diode.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – Energy levels and atomic structure: The atom, models, wave nature of light, dual nature of matter, wave function energy-band theory of metals. Insulators and semiconductors, crystal structure, ionic, covalent and metallic bonding, energy band of crystals. Internal structure of materials cell, packing miller indices, crystal planes and directions, brag's law and x-ray diffraction, electronic ballistics. Electrical Conduction in metals: Mobility and conductivity, energy distribution of electrons, Fermi level, work function. [67 hrs] Part B – Semiconductors: Semiconductors materials (Si, Ge and compound Semiconductors), Extrinsic Semiconductors, Fermi-level in semiconductor, diffusion and carrier life time, Hall Semiconductor p-n Junction; P-n Junction in equilibrium, current-voltage characteristics, charge-control description of a diode transition and diffusion capacitances, diode switching times, diode models, small-signal model and load line concept introduction to heterojunctions and double heterojunctions. [54 hrs] Part C - Diode circuit application: Rectifiers, zener diodes voltage regulators clipping circuits, clamping circuits and wave form generation. Other types of Semiconductor diodes Varactor diode, tunnel diode, photodiode and photovoltaic (solar) cell, light emitting diode, principle and operation of semiconductor laser, metal electronic ballistics semiconductor diode. Preparatory week before the final Exam [54 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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	112	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Energy levels and atomic structure: The atom, models, wave nature of light, dual nature of matter, wave function
Week 2	energy-band theory of metals.
Week 3	Insulators and semiconductors, crystal structure, ionic, covalent and metallic bonding, energy band of crystals.
Week 4	Internal structure of materials cell, packing miller indices,
Week 5	crystal planes and directions, brag's law and x-ray diffraction, electronic ballistics.
Week 6	Electrical Conduction in metals: Mobility and conductivity, energy distribution of electrons, Fermi level, work function.
Week 7	Semiconductors: Semiconductors materials (Si, Ge and compound Semiconductors), Extrinsic Semiconductors, Fermi-level in semiconductor, diffusion and carrier life time, Hall effect.
Week 8	Semiconductor p-n Junction ; P-n Junction in equilibrium, current-voltage characteristics,
Week 9	charge-control description of a diode transition and diffusion capacitances, diode switching times,
Week 10	diode models, small-signal model and load line concept
Week 11	introduction to heterojunctions and double heterojunctions.
Week 12	Diode circuit application: Rectifiers, zener diodes voltage regulators
Week 13	clipping circuits, clamping circuits and wave form generation. Other types of Semiconductor diodes
Week 14	Varactor diode, tunnel diode, photodiode and photovoltaic (solar) cell, light emitting diode,
Week 15	principle and operation of semiconductor laser, metal electronic ballistics semiconductor diode.
Week 16	**Preparatory week before the final Exam**

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

Week 2	Lab 2:
Week 3	Lab 3;
Week 4	Lab 4:
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

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
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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	**Engineering Drawing & AutoCAD**			**Module Delivery**	
Module Type	**B basic**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12357**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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	• To develop problem solving skills and understanding of standards information Tools, sheets, sketching, ISO standards, lines, titles, scales, tables. • understanding of Geometrical constructions: Bisection line, Bisection an angle, pentagon, hexagon, polygon, Arc, Ellipse Projection: Introduction, First angle projection, • understanding of the production of engineering drawings, dimensions, sections. Isometric drawing (pictorial): Introduction, isometric projection, dimensions, sections. • understanding of Electrical drawing: Introduction, isometric projection, dimensions, sections. Menus toolbar, Zoom, grid, snap, limits, units, • Lines, circle, point, Arc, Ellipse, rectangles, ray, redraw, Copy, move, rotate, scale, erase, Break, mirror, array, trim, extend, Dimensions, hatch, blocks,Insert, layers, print, text.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Recognize of standards information Tools, sheets, sketching, ISO standards, lines, titles, scales, tables. • Recognize of Geometrical constructions: Bisection line, Bisection an angle, pentagon, hexagon, polygon, Arc, Ellipse Projection: Introduction, First angle projection, • Recognize of dimensions, sections. Isometric drawing (pictorial): Introduction, isometric projection, dimensions, sections. • Recognize of drawing: Introduction, isometric projection, dimensions, sections. Menus toolbar, Zoom, grid, snap, limits, units, Lines, circle, point, Arc, Ellipse, rectangles, ray, redraw, Copy, move, rotate, scale, erase, Break, mirror, array, trim, extend, Dimensions, hatch, blocks,Insert, layers, print, text.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Tools, sheets, sketching, ISO standards, lines, titles, scales, tables. Geometrical constructions: Bisection line, Bisection an angle, pentagon, hexagon, polygon, Arc Ellipse Projection: Introduction, First angle projection, the production of engineering drawings [33 hrs] Part B- dimensions, sections.Isometric drawing (pictorial): Introduction, isometric projection, dimensions, sections. Electrical drawing: Introduction, isometric projection, dimensions, sections. [33 hrs] Part C – Menus , toolbar, Zoom, grid, snap, limits, units, Lines, circle, point, Arc, Ellipse, rectangles, ray, redraw, Copy, move, rotate, scale, erase, Break, mirror, array, trim, extend, Dimensions, hatch, blocks,Insert, layers, print, text. [34 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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	22	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Introduction and standards information**
Week 2	**Tools, sheets, sketching, ISO standards, lines, titles, scales, tables.**
Week 3	**Geometrical constructions:** **Bisection line, Bisection an angle, pentagon, hexagon, polygon, Arc**
Week 4	**Ellipse Projection: Introduction, First angle projection,**
Week 5	**the production of engineering drawings, dimensions, sections.**
Week 6	**Isometric drawing (pictorial): Introduction, isometric projection,**
Week 7	**dimensions, sections. Electrical drawing:**
Week 8	**Introduction, isometric projection, dimensions, sections.**
Week 9	**Introduction, Menus**
Week 10	**toolbar, Zoom, grid, snap, limits, units,**
Week 11	**Lines, circle, point, Arc, Ellipse, rectangles, ray, redraw,**
Week 12	**Copy, move, rotate, scale, erase, Break,**
Week 13	**mirror, array, trim, extend,**
Week 14	**Dimensions, hatch, blocks,**
Week 15	**Insert, layers, print, text.**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: AutoCAD Overview
Week 2	Lab 2: ISO standards, lines, titles, scales, tables.
Week 3	Lab 3: Bisection line, Bisection an angle
Week 4	Lab 4: Ellipse Projection
Week 5	Lab 5: isometric projection
Week 6	Lab 6: Electrical drawing
Week 7	Lab 7: isometric projection, dimensions
Week 8	Lab 8 Menus
Week 9	Lab9 Zoom, grid
Week 10	Lab10, snap, limits
Week 11	Lab11 Lines, circle, point, Arc, Ellipse, rectangles, ray, redraw

Week 12	Lab12 Copy, move, rotate, scale, erase, Break,
Week 13	Lab13 mirror, array, trim, extend,
Week 14	Lab14 hatch, blocks,
Week 15	Lab15 layers, print, text.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Jeyapoovan, T. Engineering Graphics using AUTOCAD. Vikas Publishing House, 2006.	
Recommended Texts	KHAN, ZAHID A., and MUKHTAR AHMAD. *ENGINEERING DRAWING: WITH PRIMER ON AUTOCAD*. PHI Learning Pvt. Ltd., 2004.	
Websites	https://www.bing.com/search?q=Engineering+Graphics+Using+Autocad&form=ANNTH1&refig=b0a83f87d786447e89e97b3df5e86246	

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**			**Module Delivery**	
Module Type	**B basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12353**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	امجد يوسف		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**	Ph.D.	
Module Tutor	اسعد علي		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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	This module provides all the language and skills students need to improve their English, with grammar, vocabulary, and skills work in every unit. The aim is represented by the module's trusted methodology combines solid grammar and practice, vocabulary development, and integrated skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate understanding of academic texts and summarize them orally and in writing. 2. Demonstrate an ability to write with a fair degree of accuracy in a variety of genres. 3. cope effectively with everyday situations everywhere in English 4. Demonstrate learner independence and be aware of their own linguistic strengths and weaknesses. 5. Participate in discussions/seminars on a variety of subject related, academic and general topics.
Indicative Contents المحتويات الإرشادية	12.5 hrs : Reading Skills 12.5 hrs : Writing Skills 12.5 hrs : Listening Skills 12.5 hrs : Speaking Skills

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Reading a range of pre-intermediate level articles on selected general topics. Writing a topic (informal emails, e.g.,) to classmates to discuss group work. Writing and submitting an assignment to a lecturer, Writing slides for presentations. Listening to authentic material at the beginner level to develop listening skills and comprehension. For Speaking, students may self-select and discuss topics with classmates on a group project. Typical topics that could be used at this level in the teaching of vocabulary include The World Around Us (Countries, Nationality, Language, Physical world, Weather, etc.). It may be appropriate for students to select grammar points for discussion in class, or for the lecturer to select them as they arise in students' writing. Grammar points that typically arise at this level include present simple and past simple; present continuous; question forms and auxiliary verbs; comparison; word order; prepositions; basic phrasal verbs.

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	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	

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

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Unit.1 Hello!
Week 2	Unit.2 Your world
Week 3	Unit.3 All about you
Week 4	Unit.4 Family and friends
Week 5	Unit.5 The way I live
Week 6	Unit.6 Every day+ Quiz
Week 7	Unit.7 My favorites
Week 8	Unit.8 Where I live
Week 9	Unit.9 Times past
Week 10	Unit.10 We had a great time!+ Quiz
Week 11	Unit.11 I can do that!
Week 12	Unit.12 Please and thank you +Midterm exam
Week 13	Unit.13 Here and now
Week 14	Unit.14 It's time to go!
Week 15	Presentation (seminars)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	New headway beginner student book	yes
Recommended Texts	Murphy R (English Grammar in Use)	
Websites	https://apoyanblog.files.wordpress.com/2017/08/new_headway_beginner_-_student	

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	**Freedom and Human Rights**			**Module Delivery**	
Module Type	**B basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UWO4**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	اسماعيل شرهان باقر كرم		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**	PhD	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name	م.د. باسم خلف جار الله سعيد		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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	Cognitive goals 1- Acquiring the skill of distinguishing between states' relations with their citizens. 2- Dealing with the concept of human rights. 3- Acquisition of knowledge in dealing with problems affecting those rights. 4- Gaining knowledge of the origins and roots of human rights. 5- Reaching knowledge of the practical application of human rights. 6- Developing the student's ability to perform assignments and deliver them on time. 7- Logical thinking to find solutions to the problems facing students in society, especially with the increase in societal problems such as domestic violence, electronic extortion, and the spread of drug abuse. The Iraqi and the extent of his demand for the maintenance and preservation of those rights. 8- View the data on the Iraqi constitution and the extent to which it is required to maintain and preserve those rights.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Graduating a generation that is aware, educated, and aware of its duties as an individual in society and the state, and its rights in exchange for those duties. 2- Developing in society a culture of respect for the other, regardless of his beliefs, personal inclinations, attitudes, and societal behaviors. 3- Referring first and foremost to the law regarding any offensive phenomena that may prevail in the work environment. 4- Developing the student's ability to dialogue and discussion. 5- It has a major role in analyzing emerging problems in society. 6- It contributes to increasing students' knowledge of how to prepare scientific reports.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- Developing the student's ability to deal with societal problems. 2- Developing the student's ability to deal with the analysis of laws and the mechanisms of their application. 3- Developing the student's ability to deal with the multiple means available in the work environment. 4- Developing the student's ability to dialogue and discussion. 5- Developing the student's ability to employ his study tools as practical tools in the work environment. 6- Developing the ability to harmonize between the different conditions that prevail in the work atmosphere in proportion to the ability of the labor market to absorb the different conditions.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Managing the lecture in such a way that the student feels the importance of time. 2- Assigning the student some group activities and duties. 3- Allocate a percentage of the grade for group activities. 4- Developing the topic of group campaigns that shed light on negative societal phenomena and the role of students as active individuals in society. 5- Active participation in the classroom is evidence of the student's commitment and responsibility. 6 Commitment to the deadline for submitting the assignments and reports required of the student to submit them. 7- Quarterly

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	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The nature of human rights.
Week 2	Human rights in Islam.
Week 3	Human rights in modern political thought.
Week 4	Human rights in contemporary political thought.
Week 5	Human rights in international conventions
Week 6	Human rights in the Iraqi constitution in force

Week 7	Midterm exam +Human rights violations in multiple experiences with the Universal Declaration of Human Rights
Week 8	Legal rights in the International Covenant on Civil and Political Rights
Week 9	Types of rights mentioned in the Iraqi constitution in force with the provisions of the Iraqi constitution related to rights and freedoms
Week 10	The historical development of the concept of democracy in the civilization of the Mesopotamia Greek civilization and Roman civilization.
Week 11	The difference between freedom and democracy
Week 12	Islamic views in the democratic system of government
Week 13	Forms of democracy and conditions for the success of the democratic system
Week 14	Elements and pillars of the democratic system
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Human rights book, Dr. Taha Hamid Hassan	no
Recommended Texts	Human rights book, Dr. Hamid Hanoun	no
Websites	Human rights book by Dr. Riyad Al-Hadithi https://www.google.com/search?q=https%	

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	**Fundamentals of computer Science**			**Module Delivery**	
Module Type	**B basic**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**WUO3**				
ECTS Credits	**3**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	سالم محمد حسين سالم		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**	Ph.D.	
Module Tutor	علي خلف نوار		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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. Giving the student a general idea of computer material at a study environment, library, and at home.

	2. Understanding the basic rules for dealing with and managing computers (computer basics, computer components, computer and software licenses, operating systems, ...), With the aim of preparing the student to enter the programs he needs in the department. 3. Giving the student knowledge about the office applications as basic principles for students in the College of Engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowing computer peripherals, their connections and Windows system. 2. Distinguish between the important tabs in the Word program. 3. The ability to write an entire paragraph with formatting. 4. Understand the basics of power point program. 5. Understand the excel sheet program.
Indicative Contents المحتويات الإرشادية	Part A (9 hr) Introduction to computer principles. Part B (12 hr) MS Word program. Part C (12 hr) MS Excel program. Part D (12 hr) MS Power Point program.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Using computers and display screens to explain lectures to students to increase students' mental comprehension. 2. Practical applications in the computer lab of what was explained in the theoretical lecture. 3. Using direct questions in the classroom as brainstorming skills. 4. Encouraging students to solve class and homework assignments and to perform specialized reports.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Part1: Chapter One: Computer Fundamentals, Computer Components.
Week 2	Part1: Chapter Two: Computer Safety and software Licenses.
Week 3	Part1: Chapter Three: Main operating systems
Week 4	Part2: Chapter One: Introduction to Microsoft word + Quizzes1
Week 5	Part2: Chapter Two: Insert Objects to Microsoft word, Editing Documents
Week 6	Part2: Chapter Three: writing the equations
Week 7	Part2: Chapter Four: Formatting Pages
Week 8	Part3: Chapter One: Introduction to Microsoft Excel+ Quizzes
Week 9	Part3: Chapter Two: Additional Tasks in Microsoft word+ Midterm Exam
Week 10	Part3: Chapter Three: Additional Tasks in Microsoft word+ Assignments
Week 11	Part3: Chapter Four: Additional Tasks in Microsoft word
Week 12	Part4: Chapter One: Introduction to Power Point+ Quizzes3
Week 13	Part4: Chapter Two: Insert Objects and Add Animations in Microsoft Power Point+ Project
Week 14	Part4: Chapter Three: Additional Tasks in Microsoft Excel Cont.
Week 15	Part4: Chapter Four: Additional Tasks in Microsoft Excel Cont.

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	اساسات الحاسوب وتطبيقاته المكتبية	Yes
Recommended Texts		No
Websites	https://www.tutorialspoint.com/word/word_move_text.htm	

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	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**COE01**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	م.د. علي اسعد طيب لطيف		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	م.م. فراس ناجي عبيد ملاغي		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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	• Providing the students with a sufficient knowledge on doing calculations, interpreting results, and dealing with different mathematical functions and their graphs . • Providing the students with the necessary skills on dealing with transcendental functions (trigonometric, inverse trigonometric, exponential, and power, natural logarithm, hyperbolic, inverse hyperbolic functions). • Strengthen the students' knowledge on the principles of derivatives, their concept and applications in engineering. • Providing the students with a sufficient knowledge on the principles of integral (definite and indefinite), its meaning, mathematical techniques such as Trapezoidal and Simpson approximation of integrals and eventually the engineering applications of it. • Improvement of the students' skills on the dealing with complex equations and numbers in simple and different mathematical ways. • Awarding students the necessary skills of connecting the academic mathematics with real worlds engineering problems. • How to solve integrals and differentials equations with different coordinates. • Analyze equations using the matrix method. • Developing students' skills in the calculation of the area between curves, surface area of revolution, volume of revolution, length of curve.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Realize the importance of studying mathematics and its relationship to engineering sciences . • Defining and understanding functions such as the trigonometric and transcendental functions and their graph. • The students will have the ability for dealing with limits and how to check the continuity of the functions. • Define and find the relationship between Limits, Continuity and derivatives. • The students will be able to solve a wide variety of mathematical derivative problems using different mathematical methods and understand their applications. • The students will be able to solve a wide variety of mathematical integration problems using substitution and integration by parts. • To be able to use the fundamental theorem of calculus to evaluate definite integral and calculate the areas, volumes, lengths of plane curves. • Learn about mathematical analysis methods, mathematical equations and formulas, and how to apply them in engineering. • Solving complex functions. • Solving integrals and differentials equations with different coordinates. • Solving different equations using the matrix method. • Solving complex equations and numbers in simple and different mathematical ways.
Indicative Contents المحتويات الإرشادية	**Part A (16hr(** Functions: types (such as Algebraic, Trigonometry, Hyperbolic and their inverse ,(**Part A (16hr(** Functions: types (such as Algebraic, Trigonometry, Hyperbolic and their inverse), Domain and range, and Graphing of equations. **Part B (10 hr(** Limits and continuity of functions **Part C (20 hr(** Derivative: principles, their rules such as chain rule, its applications for different functions including Trigonometric, Inverse trigonometric, hyperbolic, and Logarithmic and exponential functions. **Part D (12 hr(** Integrals: its rules, methods of solve different functions (Trigonometric, Inverse trigonometric, hyperbolic, and Logarithmic and exponential functions), and its applications such as Areas between curves, Volumes of revolution, Length of the

	curve, Surface Area of revolution. Methods of Integration: Trigonometric Substitution, Quadratics, Partial Fractions, Integration by parts, Further Substitutions.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Class lectures with using illustration means. • Encouraging the students to participate in solving exercises in class to improve students' skills . • Training students on solving home works • Practicing in class questions and discussions • Doing quizzes and exams • In class questions and discussions to improve their understanding and critical thinking skills. • Supportive videos will also be available.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** 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)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Brief Review:
Week 2	Domain and range of functions
Week 3	Functions and their graphs.
Week 4	Functions and their graphs
Week 5	Limits and continuity of functions
Week 6	Limits and continuity of functions.
Week 7	Mid term
Week 8	Derivatives of functions - Rules of derivatives. - Chain rule. - Implicit derivatives. - Higher derivatives.
Week 9	Derivatives of functions - Rules of derivatives. - Chain rule. - Implicit derivatives. - Higher derivatives.
Week 10	Inverse trigonometric functions - Properties, Derivatives Rules.
Week 11	Hyperbolic functions - Properties, Derivatives Rules
Week 12	Application of Derivatives. - Velocity and acceleration. - Equation of tangent.
Week 13	Integrals - Integration formulas - Integration of logarithmic and exponential functions.
Week 14	Integration of Trigonometric, Inverse trigonometric, and Hyperbolic functions
Week 15	Integration of Trigonometric, Inverse trigonometric, and Hyperbolic functions
Week 16	**Preparatory week before the final Exam**

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

Required Texts	Thomas' Calculus: (George B. Thomas, Maurice D. Weir and Joel R. Hass , 2011, 12th Edition)	Yes
Recommended Texts	1. Matrix Methods and Differential Equations A Practical Introduction by Wynand S. Verwoerd. 2. Advanced Engineering Mathematics by Erwin Kreyszig 8th Edition. 3. Essential Engineering Mathematics by Michael Batty 2011.	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 II**			**Module Delivery**	
Module Type	**B basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12355**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	امجد يوسف		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**	Ph.D.	
Module Tutor	امجد يوسف		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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	• Understand Approximation Integral: Trapezoidal, Simpson. Vector Algebra: • Understand Vectors in space (i,j,k) unit vectors , • Understand Scalar Product, Vector Product. Complex numbers • Invented number systems, the Argand diagram, Addition, Subtraction, Product, Quotient, Power and Roots • Understand Demover's theorem. Polar Coordinates • Understand Polar Coordinate system, Graphs of polar equations, • Plane area in polar Coordinates • Understand Matrices and determinants: solution of Equations (Cramer's rule).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Integral: Trapezoidal, Simpson. Vector Algebra Recognize Vectors in space (i,j,k) unit vectors , Scalar Product, Vector Product. Complex numbers 2. Recognize Invented number systems, Addition, Subtraction, Product, Quotient, Power and Roots 3. Recognize Demover's theorem, Polar Coordinate system, Graphs of polar equations, Plane area in polar Coordinates 4. Matrices and determinants: solution of Equations (Cramer's rule).
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Understand Approximation Integral: Trapezoidal, Simpson. Vector Algebra: Understand Vectors in space (i,j,k) unit vectors , Understand Scalar Product, Vector Product. Complex numbers Invented number systems, the Argand diagram, Addition, Subtraction, Product, Quotient, Power and Roots . [62 hrs] Part B - Understand Demover's theorem. Polar Coordinates Understand Polar Coordinate system, Graphs of polar equations, Plane area in polar Coordinates Understand Matrices and determinants: solution of Equations (Cramer's rule). . [63 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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	32	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Approximation Integral: Trapezoidal,
Week 2	Simpson. Vector Algebra: Representation of Vectors in space (i, j, k) unit vectors ,
Week 3	Scalar Product, Vector Product . Complex numbers
Week 4	Invented number systems, the Argand diagram, Addition, Subtraction,
Week 5	Product, Quotient, Power and Roots

Week 6	Demover's theorem. Polar Coordinates
Week 7	The Polar Coordinate system
Week 8	Graphs of polar equations,
Week 9	Plane area in polar Coordinates
Week 10	Matrices and Determinants: Definitions,
Week 11	Properties, Inverse of a matrix,
Week 12	Solution of Equations (Cramer's rule).
Week 13	Solution of Equations (Cramer's rule).
Week 14	Review of lectures
Week 15	Review of lectures

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	calculus	Yes
Recommended Texts	calculus and solution	No
Websites	https://www.coursera.org/browse/physical-science-and-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	**Mechanical Engineering**			**Module Delivery**	
Module Type	**S support**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12358**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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	• To understand Principles of Statics: Force system, unit system, resultant of coplanar forces.components of force in space, moment of a force moment of couples, • To understand Principles of Free body diagram, coplanar system

	analysis of trusses, friction Nature of friction, theory of friction coefficient of friction, centroids & center of gravity _centroids of area centroids determined by integration • To understand moments of inertia, radius of gyration, moment of inertia of composite area • To understand Principles of Kinetics of particle, rectilinear motion curvilinear motion rectangular components of curvilinear motion, normal and tangential component of acceleration.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Force system, unit system, resultant of coplanar forces. Components of force in space, moment of a force moment of couples, 2. Recognize Principles of Free body diagram, coplanar system analysis of trusses, friction Nature of friction, theory of friction coefficient of friction, centroids & center of gravity _centroids of area centroids determined by integration 3. Recognize moments of inertia, radius of gyration, moment of inertia of composite area 4. Principles of Kinetics of particle, rectilinear motion curvilinear motion rectangular components of curvilinear motion.
Indicative Contents المحتويات الإرشادية	Part A - Statics Theory : Force system, unit system, resultant of coplanar forces. Components of force in space, moment of a force moment of couples, To understand Principles of Free body diagram, coplanar system, analysis of trusses, friction Nature of friction, theory of friction coefficient of friction, centroids & center of gravity _centroids of area centroids determined by integration [40 hrs] Part B – Dynamics moments of inertia, radius of gyration, moment of inertia of composite area To understand Principles of Kinetics of particle, rectilinear motion curvilinear motion rectangular components of curvilinear motion, normal and tangential component of acceleration. [35hrs]

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 محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Statics:** Force system, unit system, parallelogram law.
Week 2	forces and components, resultant of coplanar forces.
Week 3	components of force in space, moment of a force
Week 4	moment of couples, equilibrium
Week 5	Free body diagram, coplanar system
Week 6	analysis of trusses, friction

Week 7	Nature of friction, theory of friction
Week 8	coefficient of friction, centroids & center of gravity _centroids of area
Week 9	centroids determined by integration
Week 10	moments of inertia
Week 11	radius of gyration, moment of inertia of composite area
Week 12	**Dynamics:** Kinetics of particle, rectilinear motion
Week 13	curvilinear motion
Week 14	rectangular components of curvilinear motion,
Week 15	normal and tangential component of acceleration, kinetics (Force, mass, acceleration).
Week 16	**Preparatory week before the final Exam**

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

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

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	**B basic**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**WUO1**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	زينب دايخ مطر خباط		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**	MSc	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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	1- المهارة اللغوية للطلبة و تمكينهم من التعبير عن أفكارهم و مشاريعهم باللغة العربية و بطلاقة.

أهداف المادة الدراسية	Linguistic proficiency of students by enabling them to express their ideas and projects .in fluent Arabic 2- تجنب الطلبة التحدث باللغة الدارجة او الكلمات غير العربية .Students avoid speaking in colloquial and non-Arabic language in the simplest ways 3- كتابة التقارير و المقالات باللغة العربية و بشكل انسيابي و دقيق و منظم Writing reports and articles in fluent, concise and well-organized Arabic. 4- استخدام قواعد اللغة العربية بشكل صحيح لان اللغة هي الأداة الأساسية للتواصل بين افراد المجتمع. Use Arabic grammar correctly; Because language is the primary tool of communication between members of society. 5- قراءة و فهم النصوص الاكاديمية باللغة العربية. Reading and understanding academic texts in Arabic. 6- تطوير قابلية الطلبة على أداء المهام و تقديمها في الوقت المطلوب. Developing the student's ability to perform assignments and submit them on time.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	عند الانتهاء من هذا الفصل، سيكون الطلاب قادرين على: 1- إجادة القراءة والكتابة والتحدث باللغة العربية. 2- استخدام اللغة العربية للتواصل بفعالية في الأوساط الأكاديمية والمهنية. 3- التعرف على التعبيرات اللغوية والأدبية. 4- إظهار فهم لأهمية مهارات اللغة العربية للنجاح في الهندسة. 5- تطبيق مهارات التفكير النقدي وحل المشكلات في مواقف العالم الحقيقي. 6- يساهم في زيادة معرفة الطلاب بكيفية إعداد التقارير العلمية. Upon completion of this course, students will be able to: 1- Demonstrate proficiency in reading, writing, and speaking to Arabic. 2-Use Arabic to communicate effectively in academic and professional settings 3- Gain an understanding of linguistic and literary expressions 4-Demonstrate an understanding of the importance of Arabic language skills for success in engineering 5-Apply critical thinking and problem-solving skills to real-world situations 6- It contributes to increasing students' knowledge of how to prepare scientific reports.
Indicative Contents المحتويات الإرشادية	القواعد (12 ساعة) الاملاء (8 ساعة) الادب (6 ساعة) مهارات عامة (4ساعة)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	· تقديم المحاضرات النظرية وتحديد المعلومات الأكثر أهمية من خلال استخلاص الكلمات المفتاحية والأفكار. · يتم منح الطلاب فرصًا لإنتاج اللغة، وتلقي تعليقات مباشرة لتحسين مهاراتهم اللغوية. · Present theoretical lectures and determine the information that is most significant by extracting keywords and ideas. Students are given opportunities to produce language, and receive direct feedback to improve their language skills.

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

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Grammar: Speech and what it consists of: the noun, the verb, and the letter. First: the verb and its parts, its signs, and the past tense. القواعد:- الكلام وما يتكون منه: الاسم، والفعل، والحرف. أولاً: الفعل وأجزاؤه، وعلاماته، والفعل الماضي.
Week 2	Grammar: subject and the news, types of subject and its rulings, definition of the news and its types. القواعد: المبتدأ والخبر، أنواع المبتدأ وأحكامه، تعريف الخبر وأنواعه.
Week 3	Grammar: Inna and its sisters, the five verbs. القواعد: إن و أخواتها، الأفعال الخمسة.
Week 4	Grammar: Plural of the sound masculine and the attached to it. And Introducing the sources of the Arabic language. قواعد : جمع المذكر السالم والملحق به. التعريف بمصادر اللغة العربية..
Week 5	Grammar: the number قواعد: العدد.
Week 6	Grammar: the verbal sentence, the subject and its deputy القواعد: الجملة الفعلية والفاعل ونائبه

Week 7	Spelling: Rules for writing Hamza> الاملاء: قواعد كتابة الهمزة
Week 8	Spelling: Common linguistic errors. And punctuation marks. الاملاء: الأخطاء اللغوية الشائعة, وعلامات الترقيم
Week 9	Mid exam
Week 10	Spelling: The difference between ḍād, dha, sīn and sūf املاء: الفرق بين الضاد والظاء والسين وسوف
Week 11	Spelling: The rules for writing an alif at the end of a word. الاملاء: كتابة قواعد كتابة الالف في نهاية الكلمة
Week 12	Literature: The poet Badr Shaker Al-Sayyab, his life and collections, an analysis of the poem (Jikur and the City), and a reading and analysis of a prose text by Ibn Uyaynah the Sufi. الأدب: الشاعر بدر شاكر السياب, حياته ودواوينه, وتحليل قصيدة (جيكور والمدينة), وقراءة وتحليل نص نثري لابن عُيينه الصوفي
Week 13	Literature: The poet Nazik Al-Malaika, her life and poetry, an analysis of the poem (Strangers) and a reading of the prose text of the sermon of the pious by Imam Ali - peace be upon him - الأدب: الشاعرة نازك الملائكة, حياتها ودواوينها, وتحليل قصيدة (غرباء) وقراءة نص نثري خطبة المتقين للإمام علي – عليه السلام-
Week 14	**Qur'anic texts, lessons in Islamic education, interpretation and rhetorical miracles.** النصوص القرآنية دروس في التربية الإسلامية والتفسير والإعجاز البلاغي
Week 15	**Public lecture and discussions** محاضرة و مناقشات عامة

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Explanation of Ibn Aqeel on the Alfiyyah of Ibn Malik, edited by Muhyiddin Abdul Hamid شرح ابن عقيل على ألفية ابن مالك، تحقيق محيي الدين عبد الحميد.	Yes
Recommended Texts	Arabic language for non-specialization departments اللغة العربية للاقسام غيرالمختصة	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 Circuits I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12359**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**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 Principles of Electrical Circuits
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how Electrical Circuits work.
Indicative Contents المحتويات الإرشادية	Part A - Basic Definitions [20 hrs] Part B – Electrical Circuits I: [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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	37	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	A Review of Ac Waveforms and Analysis of AC- Circuits
Week 2	Definition of Ac quantities circuit analysis using mesh-Current method,
Week 3	analysis using node-voltage method
Week 4	Resonance in Ac circuits Series resonance, parallel resonance, resonant frequency
Week 5	Quality Factor, parallel resonance, series to parallel coversine and vice-versa.
Week 6	Admittance and Current Locus
Week 7	R,L with variable L locus , R,L with variable R Locus R,C with variable C locus , R,C with variable R locus ,
Week 8	Admittance locus for parallel circuits
Week 9	The Transient Circuits
Week 10	RC, RL, RLC circuits in series and parallel and their complete response in time and S-domain
Week 11	Periodic non-Sinusoidal Signals
Week 12	Effective value for non-Sinusoidal waves, power dissipated in circuits, response of series parallel circuits for periodic non-Sinusoidal waveforms.
Week 13	Two- Port Networks
Week 14	Two-port networks, Z-Y parameters, Analysis of the terminated two-port networks.
Week 15	Review
Week 16	Preparatory week before the final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts		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	**Electrical Circuits II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12365**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 Principles of Electrical Circuits
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how Electrical Circuits work.
Indicative Contents المحتويات الإرشادية	Part A - Basic Definitions [20 hrs] Part B – Electrical Circuits I: [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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	37	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Two- Port Networks
Week 2	Two-port networks, Z-Y parameters,
Week 3	Analysis of the terminated two-port networks
Week 4	Coupling circuits
Week 5	Mutual coupling, coefficient of coupling,
Week 6	equivalent circuits linear and ideal transformers.
Week 7	Polyphaser Circuits
Week 8	Single–phase three wire system, circle, diagram
Week 9	3- phase balance and unbalance system
Week 10	star and delta connections,
Week 11	power in 3- phase circuits.
Week 12	power measurement using wattmeter method Filters
Week 13	Constant k- filters, low pass and high pass filter design,
Week 14	Butterworth and Chebyshev filters, and active filters.
Week 15	Review
Week 16	Preparatory week before the final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts		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	**Electrical Machines I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12361**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	اسعد علي		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**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	To understand Principles of Electrical Machines
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how Electrical Machines work.
Indicative Contents المحتويات الإرشادية	Part A - D.C Machine [20 hrs] Part B – Motors : [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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	37	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	D.C Machine
Week 2	General principle of rotating electrical machines
Week 3	calculation of induced e.m.f.,
Week 4	energy, power and torque in D.C. machines,
Week 5	construction of D.C. machines and function of commutator.
Week 6	Type of armature windings of m.m.f. per pole.
Week 7	Type of excitation connections,
Week 8	armature reaction, commutation type
Week 9	characteristics of D.C. generators,
Week 10	parallel operation of D.C. generators,
Week 11	losses and efficiency of D.C. machines.
Week 12	Motors: Principle of operation of D.C. motors,
Week 13	calculation of speed
Week 14	calculation of torque.
Week 15	Review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Lab. **Material Covered**
Week 1	Exp-1: No-Load Characteristics of D.C. Shunt Generator
Week 2	Exp-2: Load Characteristics of D.C. Shunt Generator
Week 3	Exp-3: Magnetization and Load-Characteristics Of D.C Series Generator
Week 4	Exp-4: Load Test of D.C. Shunt-Wound Motor
Week 5	Exp-5: Speed Control of D.C. Shunt-Wound Motor
Week 6	Exp-6: No Load Test and Short Circuit Test of a Single-Phase Transformer
Week 7	
Week 8	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts		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	**Electrical Machines II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12367**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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	To understand Principles of Electrical Machines
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how Electrical Machines work.
Indicative Contents المحتويات الإرشادية	Part A - D.C Machine [20 hrs] Part B – Motors : [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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	37	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Motors: Starting of D.C. motors
Week 2	characteristics of D.C. motors and their type,
Week 3	speed control of D.C. motors
Week 4	electrical breaking,
Week 5	testing of D.C. machines.
Week 6	Transformer: Transformer type and constriction, transformer action, Faraday's and Lenz's low transformer general equation, voltage ratio, current ratio power rating equations, volt per turn from general equation volt per turn in terms of power rating.
Week 7	losses in transformer, equations of these losses relating to transformer variables as a functions of frequency and voltage (eddy current loss and hysteresis loss),
Week 8	tapping of transformer,
Week 9	regulation calculations using voltage values ,
Week 10	
Week 11	equivalent circuits of the transformer, leakage reactance, equivalent resistances, reactance and impedances , phasor diagram, short circuits- test and open – circuits test, regulation calculations using short and open circuit test,
Week 12	power rating related to window and core area of transformer, efficiency calculation using short and open circuit tests, max efficiency, all day efficiency, short circuit times as related current rating,

Week 13	**transformer polarity, parallel operation of transformers, three- phase transformers, connection of three - phase transformers, importance of connecting transformer neutral to the earth, phasor groups, zigzag transformer,**
Week 14	**voltage grading of transformer, harmonies in transformer, auto transformer and their types , calculation of power rating of auto transformer.**
Week 15	**Review**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Lab. **Material Covered**
Week 1	**To Determine the Efficiency of Three Phase Transformer by Open Delta Test**
Week 2	**Separation of a Single-Phase Transformer Core Losses**
Week 3	**Parallel Operation of Two Three Phase Transformers**
Week 4	**To Study the Effect of External Rotor Resistance on The Performance of Three Phase Wound Rotor Induction Motor**
Week 5	**Determination of Performance Characteristics of a three Phase Squirrel Cage Induction Motor By Load Test**
Week 6	**Performance Determination of a Three Phase Induction Motor from Circle Diagram**
Week 7	**To Control the Speed of Three Phase Induction Motor By Stator Voltage Variation And Variable Frequency Supply**
Week 8	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts		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	**Electromagnetic Fields I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12358**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 Electromagnetic Fields 2. To understand the basics of Electromagnetic Fields
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize the principle of Electromagnetic Fields
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A</u> Vector algebra: [15 hrs] Coulombs law and electric field intensity : [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] Gauss 's laws& divergence; [15 hrs] Revision problem classes [6 hrs] <u>Part B -</u> Energy density in electrostatic field [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type 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	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Vector algebra: The Cartesian coordinate system, vector components and unit,
Week 2	vector field, dot product, cross product, circular cylindrical coordinate system, spherical coordinate system.
Week 3	Coulombs law and electric field intensity
Week 4	Coulombs law, electric field intensity- field of a point charges,
Week 5	field due to a continuous volume charge distribution, field of line charge, field of sheet of charge,
Week 6	streamline and sketches of fields, electric flux density.
Week 7	Gauss ’s laws& divergence:

Week 8	Electric flux density, Gauss ’s law – application of Gauss ’s law,
Week 9	differential volume element- divergence, Maxwell ’s first equation.
Week 10	Vector operation& divergence theorem
Week 11	Energy & potential energy expended in moving a point charge,
Week 12	the line integral- definition of potential difference & potential, the potential field of point charge.
Week 13	The potential field of system charge, conservative property, potential gradient, the dipole.
Week 14	Energy density in electrostatic field Conductors, dielectrics& capacitance, current & current density
Week 15	, continuity of current metallic conductors, conductor properties & boundary condition, method of image semiconductors, nature of dielectric material.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts		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	**Electromagnetic Fields II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12364**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 Electromagnetic Fields 2. To understand the basics of Electromagnetic Fields
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize the principle of Electromagnetic Fields
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A</u> Vector algebra: [15 hrs] Coulombs law and electric field intensity : [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] Gauss 's laws& divergence; [15 hrs] Revision problem classes [6 hrs] <u>Part B -</u> Energy density in electrostatic field [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type 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	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Vector algebra: The Cartesian coordinate system, vector components and unit,
Week 2	vector field, dot product, cross product, circular cylindrical coordinate system, spherical coordinate system.
Week 3	Coulombs law and electric field intensity
Week 4	Coulombs law, electric field intensity- field of a point charges,
Week 5	field due to a continuous volume charge distribution, field of line charge, field of sheet of charge,
Week 6	streamline and sketches of fields, electric flux density.
Week 7	Gauss ’s laws& divergence:

Week 8	Electric flux density, Gauss ’s law – application of Gauss ’s law,
Week 9	differential volume element- divergence, Maxwell ’s first equation.
Week 10	Vector operation& divergence theorem
Week 11	Energy & potential energy expended in moving a point charge,
Week 12	the line integral- definition of potential difference & potential, the potential field of point charge.
Week 13	The potential field of system charge, conservative property, potential gradient, the dipole.
Week 14	Energy density in electrostatic field Conductors, dielectrics& capacitance, current & current density
Week 15	, continuity of current metallic conductors, conductor properties & boundary condition, method of image semiconductors, nature of dielectric material.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts		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	**Electronic Circuits I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12360**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 Principles of Electronic Circuits I
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how Electronic Circuits work.
Indicative Contents المحتويات الإرشادية	Part A - Basic Definitions [20 hrs] Part B – Electronic Circuits : [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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	37	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Bipolar Junction Transistors (BJTs)
Week 2	Basic transistor operation,
Week 3	volt-ampere equations for the BJT, regions of operation,
Week 4	BJT configuration (CB, CE, and CC) and the input and output characteristics.
Week 5	Dc biasing of BJT (fixed biased cct.
Week 6	Voltage feedback cct., circuit with emitter resister,
Week 7	voltage divider cct. and CB circuit
Week 8	using npn and pnp BJT.BJT as a switch.
Week 9	Stability factor of BJT & compensation techniques.
Week 10	AC analysis of BJT, as amplifier,
Week 11	small – signal models, (h model).
Week 12	Ac analysis of CE, CB, and CC configurations,
Week 13	AC analysis of BJT using re- model for the same configuration.
Week 14	Review
Week 15	Review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Lab. **Material Covered**
Week 1	Normal Diode characteristic
Week 2	Zener Diode characteristics
Week 3	HWR, FWR, Bridge, rectifier
Week 4	Clipper Diode Circuit
Week 5	Clamper Diode Circuit
Week 6	Differentiator and Integrator
Week 7	Common Base Characteristics
Week 8	Common Emitter Characteristics

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts		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	**Electronic Circuits II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12366**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**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 Principles of Electronic Circuits I
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how Electronic Circuits work.
Indicative Contents المحتويات الإرشادية	Part A - Basic Definitions [20 hrs] Part B – Electronic Circuits : [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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	37	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Field Effect Transistors (FETs)
Week 2	Junction field – effect transistor (JFET)
Week 3	physical operation and static characteristics.
Week 4	Metal – Oxide semiconductor FET (MOSFET),
Week 5	depletion MOSFET D-MOSFET, enhancement E- MOSFET.
Week 6	The main parameters of FET, the operation characteristics for different FET types.
Week 7	DC analysis of FET, the FET as an amplifier.
Week 8	AC analysis of FET,
Week 9	Small – signal FET models,
Week 10	analysis of CS, CD and CG configurations.
Week 11	Multistage Amplifiers
Week 12	Analysis of multistage amplifiers (voltage gain, current gain, etc….)
Week 13	types of multistage amplifiers (cascade, ….etc.).
Week 14	Review
Week 15	Review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Lab. **Material Covered**
Week 1	Common Collector Characteristics
Week 2	Common Base Amplifier
Week 3	Common Emitter Amplifier
Week 4	Common Collector Amplifier
Week 5	Transistor as Inverter
Week 6	FET-Transistor Characteristics
Week 7	FET Amplifier
Week 8	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts		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	**Embedded Systems**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12373**				
ECTS Credits	**4**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Assist Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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. Advice the student to understand the purpose of studying the Embedded Systems in general. 2. Urging the student to think about how to develop himself in the field of Embedded Systems. 3. Making the student able to deal with the Embedded Systems and how to use their programs.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The student learns the basics of embedded systems. 2. Understand the basics of the hardware and software components of embedded systems. 3. Learn how complex embedded systems work.
Indicative Contents المحتويات الإرشادية	Part A – embedded systems [20 hrs] Part B – PLC [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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
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, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Embedded Systems Overview**
Week 2	Characteristics of an Embedded System
Week 3	Basic Structure of an Embedded System
Week 4	**Embedded system hardware,** Processors in a System, Types of Processors, Types of Embedded Systems, Real Time Embedded Systems, Networked Embedded Systems
Week 5	**System software**
Week 6	**System software**
Week 7	Design of Embedded Systems, Serial Communication, Parallel Communication, Memory Mapped I/O,
Week 8	Direct Memory Access, Synchronous, Asynchronous and Iso-Synchronous Communication, Serial Communication Protocols
Week 9	Programmable Interface Controllers, Architecture of PIC Microcontroller
Week 10	General Purpose Registers (GPR), Special Function Registers
Week 11	Real Time Operating System
Week 12	VLSI Design and Reconfigurable Architecture
Week 13	**Complex Embedded Systems, Microcontroller Based System Design**

Week 14	**Complex Embedded Systems, Microcontroller Based System Design**
Week 15	Review
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to PIC trainer - PIC Trainer Hardware -PIC Trainer Software
Week 2	Lab 2: 7-segment display & simple control
Week 3	Lab 3: Traffic lights & sound generator
Week 4	Lab 4: Two-digit counter & logic gates
Week 5	Lab 5: Display and keypad scanner & LCD control
Week 6	Lab 6: Interrupts & timer keypad and display
Week 7	Lab 7: Pic EEPROM access, A-D conversion, & D-A conversion
Week 8-14	Lab 8: Robot Structure

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Peter Marwedel, "Embedded System Design", Springer, Second Edition 2011.	No
Recommended Texts	Tim Wilmshurst, "Designing Embedded Systems with PIC Microcontrollers Principles and applications", Second Edition 2010.	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	**Engineering Mathematics I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12357**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 **Engineering Mathematics II**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Engineering Mathematics II
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Brief Review of Algebraic and Trigonometric [15 hrs] Part B - . [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type 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	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem)	175		

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Sequences and Series: i) Sequences
Week 2	Convergence, test of monotone.
Week 3	ii) Series: Geometric Series, nth partial sum, test of convergence, alternating Series.
Week 4	iii) Power series and Tayler´s series Fourier Series:
Week 5	i) Periodic Function.,
Week 6	ii) Fourier series – Euler Formulas.
Week 7	iii) Even and Odd Function, (Half Range Expansion).
Week 8	iv) Application of Electrical Engineering. Partial Differentiation:
Week 9	i) Function of two or more variable.
Week 10	ii) Partial derivatives
Week 11	iii) Directional derivative,
Week 12	iv) Gradient, divergence and curl.
Week 13	v) Tangent plane and normal line.,
Week 14	vi) Maxima, minima and saddle point, Review
Week 15	Review
Week 16	**Preparatory week before the final Exam**

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

اسم مسؤول المقرر الدراسي: **م.م. نبراس حازم عباس**

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Mathematics II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12363**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**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 **Engineering Mathematics II**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Engineering Mathematics II
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Brief Review of Algebraic and Trigonometric [15 hrs] Part B - . [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type 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	109	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem)	175		

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Ordinary Differential Equations:
Week 2	i) First order (variables separable, homogeneous, linear – Bernoulli and exact).
Week 3	ii) Second order (homogeneous and non – homogeneous).
Week 4	iii) Higher order differential equation. Laplace Transform (L.T.):
Week 5	A)Laplace Transform (L.T.):
Week 6	i) Unit step function, ii) Gamma function,
Week 7	iii) Definition of LT, iv) Properties.
Week 8	B) Inverse Laplace Transform:
Week 9	i) Properties, ii) Partial fraction iii) Solution of differential equation using Laplace Transform.
Week 10	C) Applications (Orthogonal Trajectories and Electric Circuit). Multiple Integrals:
Week 11	i) Double integral, ii) Areas and volumes.
Week 12	ii) Double integral in polar coordinates.
Week 13	iii) Evaluation of volume and triple integral.
Week 14	iv) Evaluation of volume and triple integral) Evaluation of surface and surface integrals.

Week 15	Vectors; i) Equations of lines and planes. ii) Product of three or more vectors. iii) Vector function & motion: velocity and acceleration. iv) Tangential vectors, v) curvature and normal vector.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		Yes
Recommended Texts		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	**Computer Architecture**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UoW12362**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**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 Computer Architecture
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Computer Architecture.
Indicative Contents المحتويات الإرشادية	Part A – Computer Architecture [20 hrs] Part B – PLC [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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	37	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Processors Architecture,** Internal Microprocessor organization, RISC vs CISC Instruction Cycle, Single Cycle Data Path and Control, Instruction-Level Parallelism (Pipelining),
Week 2	Pipelined Data path and Control, Data Hazards, Control Hazards and Exceptions, Processor-Level Parallelism.
Week 3	**Memory Organization and I/O Systems,** Memory Hierarchy, Basic principles of the cache, Virtual Memory, Real Mode Memory Addressing.
Week 4	Protected Mode Memory Addressing, Program-Invisible Registers
Week 5	The Memory Paging Mechanism, Memory Address decoding, Memory Interface (8-bit, 16-bit, 32-bit and 64-bit),
Week 6	Multiprocessor Memory Architectures, I/O Address decoding, I/O Interface (8-bit, 16-bit, 32-bit and 64-bit), Serial and Parallel I/O
Week 7	**Field-Programmable Gate Arrays (FPGAs)**
Week 8	**Interrupts, Bus Interface,** the Peripheral Component Interconnect Express (PCIe) bus, The Universal bus (USB)
Week 9	**Parallel Processors,** SISD, MIMD, SIMD, SPMD, and Vector Multiprocessor vs Multicomputer, Hardware Multithreading, Multicore and Other Shared Memory Multiprocessors.

Week 10	Introduction to Graphics Processing Units, Introduction to Multiprocessor Network Topologies, Cluster Computing, Grid Computing, Cloud Computing
Week 11	**8086 Microprocessor,** Internal architecture of 8086, CPU register, Status flag, ALU buffers, addressing modes,
Week 12	Assembly language, Microprocessor 8086 types of assembler's opcodes,
Week 13	Instruction format 8086 introduction sets, Data transfer group,
Week 14	Arithmetic & logical group, branching group, Stack I /O group, Interrupts and Interrupt control.
Week 15	Review
Week 16	**Preparatory week before the final Exam**

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

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

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Lab. **Material Covered**
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	

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