وزارة التعليم العالي والبحث العلمي

جـــهاز الإشـــراف والتقـويم العلـمي

دائرة ضمان الجودة والاعتماد الأكاديمي

وصف البرنامج الأكاديمي لقسم هندسة الالكترونيك

للعام الدراسي ٢٠٢٣ – ٢٠٢٤

نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة: نينوى

الكلية/ المعهد: كلية هندسة الالكترونيات

القسم العلمي: قسم هندسة الالكترونيك

اسم البرنامج الأكاديمي او المهني: بكالوريوس علوم هندسة الالكترونيك

اسم الشهادة النهائية: بكالوريوس علوم هندسة الالكترونيك

النظام الدراسي: سنوي مع نظام بولونيا للصف الاول والثاني

تاريخ اعداد الوصف: ٢٤-٥-٢٠٢٤

تاريخ ملء الملف: ٢٤-٥-٢٠٢٤

التوقيع

اسم رئيس القسم: أ.م.د. حارث احمد محمد

التاريخ

التوقيع

اسم المعاون العلمي: أ.م.د. بلال علاء الدين جبر

التاريخ ١٧ / ١٠ / ٢٠٢٤

دقق الملف من قبل شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: ياسر محمد حسين

التاريخ ١٦ / ١٠ / ٢٠٢٤

التوقيع

مصادقة السيد العميد

أ.د. خالد خليل محمد

١٧ / ١٠ / ٢٠٢٤

١. رؤية البرنامج

ان يكون قسم هندسة الالكترونيك متخصصا في علوم هندسة الالكترونيات وأن يتميز بتعليمه الهندسي والبحث العلمي المؤدي الى تقدم المعرفة وتطوير المهنة وخدمة المجتمع من خلال الشراكة مع الصناعات والمؤسسات الهندسية والخدمية وتخريج الكوادر لرفد المجتمع بكوادر عالية الكفاءة.

٢. رسالة البرنامج

١. التعليم: توفير برامج هندسية تعليمية متخصصة ذات تخصص دقيق للدراسات الأولية والعليا. وتوفير بيئة تعليمية متميزة معترف بها بحيث يمتلك خريجوها خبرة مهنية عالية وتعليم هندسي اساسي تمكنهم من المساهمة بفعالية في خدمة مجتمعهم ورفع مستوى وتقدم مهنتهم. كل ذلك يقع ضمن المواصفات العالمية القياسية ويتم تنفيذه باعتماد نظام الجودة ABET في مجال التعليم الهندسي

٢. البحث: توفير بيئة بحثية عالية المستوى بحيث يتمكن اساتذته وباحثوه وطلابه من قيامهم بالبحوث في المجالات الهندسية الاساسية والتطبيقية والاستكشافية ونشر وتطبيق المعرفة المتوافرة والجديدة بما يخدم المجتمع والمنطقة ويتفاعل مع العالم.

٣. القيادة: توفير بيئة بحثية عالية المستوى بحيث يتمكن اساتذته وباحثوه وطلابه من قيامهم بالبحوث في المجالات الهندسية الاساسية والتطبيقية والاستكشافية ونشر وتطبيق المعرفة المتوافرة والجديدة بما يخدم المجتمع والمنطقة ويتفاعل مع العالم.

٤. خدمة المجتمع: التفاعل مع المجتمع والانخراط في مجال تطوير صناعة البلاد والمؤسسات الهندسية الذي يؤدي الى التطوير الاجتماعي والاقتصادي للبلد من خلال الاستشارات والتعليم المستمر والتزام المشاكل الصناعية كبحوث لتقديم الحلول لها.

٣. اهداف البرنامج

أ. تخريج مهندسين مختصين في مجال علوم هندسة الإلكترونيك وتطبيقاتها وبمواصفات عاليه ويمتلكون القدرة على العمل في القطاع العام والخاص.

ب. المساهمة الفعالة في نهضة وتقدم المجتمع من خلال عقد الندوات والموتمرات والتعليم المستمر
ج.انتاج بحوث علمية رصينة تطبيقية في تخصص الهندسة الالكترونيه لغرض حل المشاكل الصناعية والخدمية في المجتمع
د. تعزيز جانب القيادة لدى المنتسبين والخريجين وبث روح التعاون بينهم
ه- منح شهادات عليا في تخصصات القسم المختلفة وبمواصفات عالية
و- اعتماد منهج التحديث في المناهج الدراس وتحسين الاداء في الفعاليات والانشطة لضمان تحقيق الاهداف المنشودة للقسم وحسب معايير الجودة (معاييرABET)

٤. الاعتماد البرامجي				
لا يوجد				
٥. المؤثرات الخارجية الأخرى				
لا يوجد				
٦. هيكلية البرنامج				
هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات *
متطلبات المؤسسة	٤	١٢	٧.٨٪	مقرر اساسي
متطلبات الكلية	٨	٣٦	٢٣.٤٪	مقرر أساسي
متطلبات القسم	٢٥	١٠٦	٦٨.٨٪	مقرر أساسي
التدريب الصيفي	في المرحلة الثالثة			أساسي
أخرى				

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

٧. وصف البرنامج				
المرحلة الدراسية	رمز المقرر أو المساق	اسم المقرر أو المساق	الساعات المعتمدة	
			نظري	عملي
الاول / الفصل الدراسي١	NVEE206	Mathematics I	٣	-

٣	٣	DC Circuits Analysis	NVEE215	الاول / الفصل الدراسي١
-	٢	Physical Electronics	NVEE218	الاول / الفصل الدراسي١
٢	2	Computer science	NVEEEL114	الاول / الفصل الدراسي١
-	٢	Mechanical engineering principles	NVEE203	الاول / الفصل الدراسي١
-	٢	Democracy and Human Rights	NV12	الاول / الفصل الدراسي١
٣	٣	AC Circuits Analysis	NVEE216	الاول / الفصل الدراسي٢
	٣	Mathematics II	NVEE207	الاول / الفصل الدراسي٢
-	٢	Physics Of Semiconductor	NVEE219	الاول / الفصل الدراسي٢
٢	٢	Digital Techniques	NVEE217	الاول / الفصل الدراسي٢
٣	-	Engineering Drawing	NVEE201	الاول / الفصل الدراسي٢
	٢	English	NVU11	الاول / الفصل الدراسي٢
				الثاني /الكترونيات الاجهزة الطبيه
-	٢	Engineering Analysis I	NVEE208	الثاني / الفصل الدراسي١
٢	٢	Signal Analysis	NVEEELM211	الثاني / الفصل الدراسي١
٣	٢	Electronic I	NVEEELM212	الثاني / الفصل الدراسي١
-	٣	Digital design	NVEE223	الثاني / الفصل الدراسي١
٢	٢	Electromagnetic fields I	NVEE215	الثاني / الفصل الدراسي١
-	٢	Human Physiology	NVEEELM 213	الثاني / الفصل الدراسي١
٢	٢	signals and systems	NVEE210	الثاني / الفصل الدراسي٢
-	٢	Engineering Analysis II	NVEE209	الثاني / الفصل الدراسي٢
-	٢	Electronic II	NVEEELM221	الثاني / الفصل الدراسي٢
٢	٢	programming	NVEEELM222	الثاني / الفصل الدراسي٢
	٢	Electromagnetics FieldsII	NVEE221	الثاني / الفصل الدراسي٢
-	٢	The Crimes of the Defunt Baath Party	NVU13	الثاني / الفصل الدراسي٢
				الثاني /صناعي
-	٢	Engineering Analysis I	NVEE208	الثاني / الفصل الدراسي١
٣	٢	Electronic I	NVEEELI212	الثاني / الفصل الدراسي١
٢	٢	DC Machines	NVEEELI213	الثاني / الفصل الدراسي١
٢	٢	Computer Programming	NVEEELI214	الثاني / الفصل الدراسي١
-	٢	The crimes of the defunct Baath Party	NVU13	الثاني / الفصل الدراسي١
-	٢	Fundamentals of Electromagnetics	NVEE221	الثاني / الفصل الدراسي١
-	٢	Engineering Analysis II	NVEE209	الثاني / الفصل الدراسي٢
٢	٢	Electronics II	NVEEELI222	الثاني / الفصل الدراسي٢
٢	٢	AC Machines	NVEEELI223	الثاني / الفصل الدراسي٢
٢	٢	Computer Languages	NVEEELI224	الثاني / الفصل الدراسي٢
-	٣	Digital Design	NVEE223	الثاني / الفصل الدراسي٢
٢	٢	Signals and Systems	NVEE210	الثاني / الفصل الدراسي٢
-	3	Electronic II	EE3301	الثالث

الثالث	EE3201	Digital Signal Processing	٣	-
الثالث	EE3302	Control Engineering	3	-
الثالث	EE3303	Microprocessors	٣	-
	EE3304A	Digital System Design I		
الثالث	EE3304B	Digital System Design II	٣	-
الثالث	EE3305	Communications	٣	-
الثالث	EE3306	ELECTRONIC INSTRUMINTATION	٣	-
الثالث	EE3307	Laboratory	-	٦
الرابع	EE4301	Industrial Electronic	٣	-
الرابع	EE4302	DATA TRANSMISSION& COMPUTER ETWORKS	٣	-
الرابع	EE4303	Microprocessor & Micro Controller	٣	-
الرابع	EE4304	Microelectronics	٣	-
الرابع	EE4305	Radiation	٣	-
	٨EE430	Antenna and Propogation		
الرابع	EE4306	Computer aided design	٣	-
الرابع	EE4307	Engineering Project	1	٣
الرابع	EE408	Laboratory	-	٦

٨. مخرجات التعلم المتوقعه للبرنامج

أ - الاهداف المعرفية

أ١.تمكين الطلبة الخريجين من الحصول على المعرفة والفهم والمبادئ والنظريات الأساسية في مجال هندسة الإلكترونيك

أ٢.تمكين الطلبة الخريجين من فهم واستيعاب المواضيع العلمية الحديثة المتقدمة في مجال الاختصاص الدقيق في هندسة الإلكترونيك.

أ٣.تمكين الطلبة الخريجين من فهم المبادئ والأساسيات الرياضية لتمثيل الانظمة وتحليلها ودراستها وكيفية تصميم أنظمة الكترونية مختلفة

أ٤ .مساعدة الطالب على الاطلاع على اهم البرامجيات الحاسوبية التي تستخدم في مجال حل المشاكل الهندسية و ان يكون قادرا على فهم اسس عمل الانظمة الالكترونية وكيفية برمجتها ليقوم بمهام عملية معينة.

ب- الاهداف المهاراتية الخاصة بالبرنامج

ب١ القدرة على تصميم وتنفيذ المكونات التجميعية للانظمة الالكترونيه

ب٢ القابلية على تصميم وتنفيذ برامجيات مختلفة ، بالاضافة الى تلك التي تخص نظم التشغيل ألاساسية ونظم المعلومات والقدرة على استخدام التقنيات المتقدمه والمتنوعة وتوظيفها في التطبيقات المختلفة.

ب٣ التمكن من فهم اسس تصميم وعمل أجهزة الالكترونيه ومواكبة التكنلوجيا الحديثه

ب٤ التمكن من وضع المواصفات المناسبة للاجهزة الالكترونيه والبرامج الأساسية اللازمة لتشغيلها ، اضافة الى التجهيزات الفنية اللازمة لتنفيذ عمليات الاتمتة والحكومات الالكترونية.

استراتيجيات التعليم والتعلم

- المتابعه من خلال سير تنفيذ الواجبات والدقة في التعامل معها
- تشكيل مجاميع صغية من الطلبه لحل معضلة معينه وتبادل الاراء مع الزملاء بخصوصها
- فتح باب النقاش في بعض المسائل وبالشكل الذي يضمن مشاركة الجميع والتعود على سماع اراء مختلفه

طرائق التقييم

١الامتحانات الفصلية والنهائية

-٢الامتحانات اليومية القصيرة

-٣اجراء التجارب المختبرية وكتابة التقارير ومناقشة النتائج المختبرية

-٤المشاركة في مؤتمرات علمية والنشاطات الصفية التي تتضمن تصميم بعض انظمة الالكترونية

-٥امتحانات الكترونية وتكليفات ضمن وقت محدد على المنصات التعليمية

ج- الاهداف الوجدانيه والقيمية

ج١ تطوير قدرة الطالب للعمل على أداء الاعمال المناطة له وانجازها في الموعد المحدد بدقة واخلاص.

ج٢ لتفكير التحليلي العلمي المبني على قواعد اساسية علمية ومنطقية.

ج٣ تمكين الطالب من الحوار والمناقشة بالمسائل المتعلقة بتخصصه بشكل مثمر.

ج٤ تبادل الاراء وافساح المجال للاخرين لتوضيح وجهات النظر المختلفة في المسائل المطروحة.

طرائق التقييم

- ✓ تقييم وتصحيح الاعمال المشتركة للطلبة (اساسية وتطبيقية).
- ✓ تمييز اصحاب الاراء البناءة والمنهج العلمي في حل المشاكل المختلفة.
- ✓ اعتماد آراء الطلبة والتغذية الراجعة من خلال الاستبيانات الالكترونية واخذ الآراء حسب الاكثرية

د- المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي)

١. القدرة على التحليل العلمي والمنطقي المبني على حقائق اساسية او الخبرة التطبيقية عند التوظيف.
٢. امكانية استخدام االتكنلوجيا المتقدمه على اختلاف انواعها للقيام يتطبيقات مهمة في مجال هندسه الالكترونيات المختلفه
٣. القدرة على العمل ضمن فريق واحد والتعاون لانجاز مهمة معينة من خلال المشاركة الفاعلة وتبادل مختلف الآراء للوصول إلى الحل الأمثل.
٤. القابلية على التطوير الذاتي وطرق ابواب التكنلوجيا الحديثة والتطبيقات المتطورة والاستفادة من المعلومات والمهارات المكتسبة في البرنامج الاكاديمي.

طرائق التعليم والتعلم

- ✓ المتابعة المستمرة لسير البرنامج االكاديمي وبكافة فعالياته.
- ✓ تشكيل مجاميع من الطلبة واشراكهم في حل مشكلة واقعية ومناقشة الحلول المقترحة.
- ✓ فتح باب التحاور لبعض المسائل وسماع اراء مختلفة حول البرنامج وتطويره بشكل مستمر.
- ✓ التركيز على طبيعة المشاكل التي تعالجها مشاريع التخرج للسنة المنتهية والتاكيد على التطبيقية منها والتي تكسب الطالب خبرات اضافية تفيده لاحقا في مجال العمل عند التوظيف.

طرائق التقييم

- ✓ تقديرات الطلبة عند التخرج.
- ✓ نسبة المشاركة في الأنشطة والأعمال المختلفة.
- ✓ التقدير الذاتي والمقارنة مع تقدير الزملاء والأساتذة.
- ✓ المقابلات الشخصية مع الطلبة المقبلين على التخرج.
- ✓ المقابلات مع الجهات المستفيدة وشركات التوظيف.

٩. طرائق التقييم
• المشاركة في قاعة الدرس الحضورية او الالكترونية. • تقديم التقارير المختبرية. • تقييم التنفيذ العملي للتجارب. • تقديم الانشطة المختلفة. • اختبارات يومية وفصلية ونهائية حضوريا والكترونيا.

١٠. الهيئة التدريسية

ت	الاسم الكامل واللقب	اللقب العلمي	الشهادة	الاختصاص العام	الاختصاص الدقيق
1	خالد خليل محمد جاسم	أستاذ	هندسة كهرباء	الكترونيك واتصالات	دكتوراه
2	قيس ذنون نجم عبد الله ال احمد جاسم	أستاذ	علوم فيزياء	بلازما	دكتوراه
3	احمد ذنون يونس حسين النقيب	أستاذ مساعد	هندسة كهرباء	الالكترونيات الدقيقة	دكتوراه
4	مجاهد فهمي إبراهيم إسماعيل العزو	أستاذ مساعد	هندسة كهرباء	اتصالات	دكتوراه
5	اوس زهير يونس سليمان	أستاذ مساعد	هندسة حاسوب	اتصالات	دكتوراه
6	حارث احمد محمد احمد البدراني	أستاذ مساعد	هندسة كهرباء	الكترونيات القدرة	دكتوراه
7	احمد محمد احمد سلامة	أستاذ مساعد	هندسة كهرباء	اتصالات	دكتوراه
٨	هشام سوادي هاشم	أستاذ مساعد	دكتوراه	تاريخ	تاريخ حديث
9	عمر بدر محمد خضر النعيمي	مدرس	هندسة كهرباء	الالكترونيات الدقيقة	دكتوراه
10	إيهاب عصام داؤد سليمان الراوجي	مدرس	هندسة حاسبات	اتصالات	دكتوراه
11	سحر لازم قدوري خضير الدليمي	مدرس	هندسة حاسبات	حاسوب ومعلوماتيه	دكتوراه
12	سرمد فخرالدين إسماعيل جاسم المولى	مدرس	هندسة حاسبات	تحليل ومعالجة الصورة الرقميه	دكتوراه
13	سنان خالد محمد حسن شنشل	مدرس	هندسة كهرباء	الكترونيك و اتصالات	ماجستير
14	نور طلال محمود عزيز كداوي	مدرس	هندسة كهرباء	الكترونيك واتصالات	ماجستير
15	خالد فزع محمود محمد	مدرس	هندسة كهرباء	الكترونيك واتصالات	ماجستير
16	عماد عبد الحليم عبدوعلي ال ملا خضر	مدرس	هندسة الكترونيك	الكترونيك	ماجستير
17	عبد الحميد محمد جاسم محمد الجبوري	مدرس	هندسة الكترونيك	الكترونيك	ماجستير
18	همسة فواز ذنون محمد الرحو	مدرس	هندسة كهرباء	حاله صلبه	ماجستير
19	هبة عبد الخالق حمدون عبد الصواف	مدرس	هندسة كهرباء	الكترونيك واتصالات	ماجستير
20	شوكت محمد يونس مال الله	مدرس مساعد	هندسة كهرباء	الكترونيات القدرة	ماجستير
21	زهراء صديق يحيى احمد الصائغ	مدرس مساعد	هندسة كهرباء	الكترونيك واتصالات	ماجستير
22	أمنة إدريس كنعان سليمان حيو	مدرس مساعد	هندسة كهرباء	الكترونيك واتصالات	ماجستير
23	أسماء نبيل خليل عمر	مدرس مساعد	هندسة حاسبات	حاسوب ومعلوماتيه	ماجستير
24	محمد إبراهيم محمد احمد	مدرس مساعد	هندسة كهرباء	الكترونيات القدرة	ماجستير
25	همام ماهر عبد شاهين الحمداني	مدرس مساعد	هندسة الكترونيك	الكترونيك	ماجستير
26	يونس صابر عثمان خطاب الرفاعي	مدرس مساعد	هندسة حاسبات	حاسبات	ماجستير
27	حارث حازم ذنون يونس	مدرس مساعد	هندسة الكترونيك	الكترونيك	ماجستير
28	يعرب عبد المحسن احمد حسين الشلاوي	مدرس مساعد	هندسة كهرباء	الكترونيك	ماجستير
29	سنان محمود أيوب محمود الرحو	مدرس مساعد	هندسة الكترونيك	الكترونيك	ماجستير
30	محمد صالح سفر رسول	مدرس مساعد	هندسة ميكانيك	هندسة الحراريات	ماجستير
31	عامر طلال علي أحمد	مدرس مساعد	هندسة الكترونيك	حاسوب ومعلوماتيه	ماجستير
32	هاني محمد صالح سلمان	مدرس مساعد	هندسة ميكانيك	هندسة الحراريات	ماجستير
33	رشا وليد حمد	مدرس مساعد	هندسة كهرباء	الكترونيك واتصالات	ماجستير
34	عمر نجيب سعدي	مدرس مساعد	هندسة كهرباء	الكترونيك واتصالات	ماجستير
35	ميسرة عبدالجبار قاسم	مدرس مساعد	هندسة كهرباء	قدرة ومكائن	ماجستير
36	هشام محمد محمود	مدرس مساعد	هندسة كهرباء	الكترونيات القدرة	ماجستير
37	هاجر خليل ابراهيم أحمد	مدرس مساعد	هندسة الكترونيك	ألكترونيك	ماجستير

38	محمد صالح سفر رسول	مدرس مساعد	هندسة ميكانيك	هندسة الحراريات	ماجستير
39	نجم عبيد ضحوي	لايوجد	هندسة	هندسة	بكلوريوس
40	طارق حسين خضر	لايوجد	هندسة	هندسة	بكلوريوس
41	مروه عصام احمد	لايوجد	هندسة	هندسة	دبلوم عالي
42	عادل غازي شريف	لايوجد	هندسة	هندسة	بكلوريوس
43	محمد موفق هادي	لايوجد	هندسة	هندسة	بكلوريوس
44	أسعد عبد الغني صالح	لايوجد	هندسة	هندسة	بكلوريوس
45	يثرب وليد قاسم خليل	لايوجد	هندسة	هندسة	بكلوريوس
46	سيف الدين كمال	لايوجد	هندسة	هندسة	بكلوريوس
47	عمار احمد عبد الله	لايوجد	هندسة	هندسة	بكلوريوس
48	لؤلؤه حازم فتح الله	لايوجد	إدارة واقتصاد	إدارة واقتصاد	بكلوريوس
49	ادريس محمد يونس احمد	لايوجد	معهد	معهد	دبلوم

١١. معيار القبول

ان خطة القبول المعتمدة للطلبة الجدد في برامج القسم تتبع بطبيعة الحال خطة القبول المركزي لوزارة التعليم العالي والبحث العلمي وتنفذ من قبل الجامعة والكلية. يمكن القول بان الطلبة الملتحقين ببرامج القسم يمثلون المستويات العليا بمعدلاتهم من المتقدمين الى كلية هندسة الالكترونيات، حيث يعتمد مبدأ المفاضلة على المعدل للدراسة الاعدادية ورغبة الطالب في تحديد البرنامج الدراسي ضمن برامج كلية هندسة الالكترونيات. لذا فان طبيعة من يقبل من الطلبة في برامج القسم هم متميزون بمستوياتهم الدراسية والفكرية وعطائهم طوال فترة البرنامج .

١٢. أهم مصادر المعلومات عن البرنامج

يمكن الحصول على بيانات وافية عن برامج القسم من خلال زيارة الموقع الالكتروني الرسمي لجامعة نينوى وتصفح موقع كلية هندسة الالكترونيات:

www.uoninevah.edu.iq

تقرير التقييم الذاتي ودليل القسم السنوي ضمن دليل الجامعة والكلية..

١٣. خطة تطوير البرنامج

تحديث المقرر سنويا حسب احدث الكتب العلمية ذات الصلة ومتطلبات سوق العمل بالإضافة الى استخدام شبكة المعلومات الدولية للاطلاع على مفردات مناهج المادة في الجامعات العالمية الأخرى والرائدة في هذا المجال.

مخطط مهارات المنهج

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

السنة / المستوى	رمز المقرر	اسم المقرر	أساسي أم اختياري	مخرجات التعلم المطلوبة من البرنامج															
				الاهداف المعرفية				الاهداف المهاراتية الخاصة بالبرنامج				الاهداف الوجدانية والقيمية				المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي)			
				أ١	أ٢	أ٣	أ٤	ب١	ب٢	ب٣	ب٤	ج١	ج٢	ج٣	ج٤	د١	د٢	د٣	د٤
الاول	NVEE206	Mathematics I	أساسي	※	※	※	※	※		※		※	※	※	※	※	※	※	※
	NVEE215	DC Circuits Analysis	أساسي	※	※	※	※	※	※	※	※	※		※	※	※	※	※	※
	NVEE218	Physical Electronics	أساسي	※	※	※		※	※	※	※	※	※	※	※	※		※	※
	NVEEELM111	Computer science	أساسي	※	※	※	※	※	※	※	※	※	※	※		※		※	※
	NVEE203	Mechanical engineering principles	ثانوي	※		※		※	※	※	※	※	※	※		※			※
	NVU12	Democracy and Human Rights	ثانوي	※			※					※	※		※		※	※	※
	NVEE216	AC Circuits Analysis	أساسي	※	※	※	※	※		※	※	※	※	※	※	※			※
	NVEE207	Mathematics II	أساسي	※	※		※	※	※		※	※	※	※	※	※	※	※	※
	NVEE219	Physics Of Semiconductor	أساسي	※		※	※	※	※	※	※			※	※	※		※	※
	NVEE217	Digital Techniques	أساسي	※	※	※	※	※	※		※	※	※	※	※	※	※	※	※
	NVEE201	Engineering Drawing	ثانوي	※	※		※	※	※	※	※	※	※	※	※	※	※	※	※
	NVU11	English	ثانوي	※	※		※	※		※	※	※	※	※	※		※	※	※
الثاني/ طبي	NVEE208	Engineering Analysis I	أساسي	※	※	※	※	※	※	※	※	※	※	※		※			※
	NVEEELM211	Signal Analysis	أساسي	※	※	※	※	※	※	※	※	※		※	※			※	
	NVEEELM212	Electronic I	أساسي	※	※	※	※	※	※	※	※		※	※	※		※	※	
	NVEE223	Digital design	أساسي	※	※	※	※	※	※	※	※	※	※	※		※	※	※	
	NVEE215	Electromagnetic fields I	أساسي	※	※		※	※	※		※	※	※	※	※		※	※	
	NVEEELM 213	Human Physiology	أساسي	※	※		※	※		※		※			※	※	※	※	
	NVEE210	signals and systems	أساسي	※		※	※	※	※	※	※	※	※	※	※	※	※	※	※
	NVEE209	Engineering Analysis II	أساسي	※	※	※	※		※	※		※	※	※		※		※	

※	※	※	※	※	※	※	※	※	※	※	※	※	※	※	※	أساسي	Electronic II	NVEEELM221	الثاني/ صناعي
	※	※			※		※	※	※	※	※	※	※	※	※	أساسي	programming	NVEEELM222	
	※	※			※		※	※		※	※	※	※	※	※	أساسي	Electromagnetics FieldsII	NVEE221	
	※	※			※		※		※	※			※	※		ثانوي	The Crimes of the Defunt Baath Part	NVU13	
※	※	※			※		※	※		※	※	※	※	※	※	أساسي	Engineering Analysis I	NVEE208	
※	※	※	※	※	※	※	※	※	※	※	※	※	※	※	※	أساسي	Electronic I	NVEEELI212	
	※	※			※		※	※	※	※		※	※	※	※	أساسي	DC Machines	NVEEELI213	
※	※	※	*	※	※	※	※		※	※	※		※	※	※	أساسي	Computer Programming	NVEEELI214	
*	※	※	*	*	※	※	※	※	※	※	※	※		※		ثانوي	The crimes of the defunct Baath Party	NVU13	
※	※	※	*	※	※	※	※	※	※	※	※	※		※	※	أساسي	Fundamentals of Electromagnetics	NVEE221	
	※	※	*		※	※	※	※	※	※	※	※	※	※	※	أساسي	Engineering Analysis II	NVEE209	
※	※		※	※	※	※	※	※	※		※	※	※		※	أساسي	Electronics II	NVEEELI222	
	※	※			※	※	※	※	※	※	※	※	※	※	※	أساسي	AC Machines	NVEEELI223	
※	※	※	※	※	※	※	※	※	※	※		※	※	※	※	أساسي	Computer Languages	NVEEELI224	
	※	※	※	※	※	※	※	※	※	※	※	※	※	※	※	أساسي	Digital Design	NVEE223	
※	*	※	*	※	※	※	※	※	※	※	※	※	※	※	※	أساسي	Signals and Systems	NVEE210	
	※	*	※	※	※	※	※	※		※	※		※	※	※	أساسي	Electronic II	EE3301	الثالث
※	※	*	※	※	※	※	※	※	※	※	※	※	※	※	※	أساسي	Digital Signal Processing	EE3201	
※	※	※	※	※	※	※	※	※	※	※	※	※	※	※	※	أساسي	Control Engineering	EE3302	
※	※	※	※	※	※	※	※	※	※	※	※		※	※	※	أساسي	Microprocessors	EE3303	
※			※	※	※	※		※	※			※	※		※	أساسي	DIGITAL SYSTEM DESIGN	EE3304	
※		※	※	※	※	※	※	※	※		※	※		※	※	أساسي	Communications	EE3305	
※	※	※	※	※	※	※	※	※	※	※	※	※	※	※	※	أساسي	ELECTRONIC INSTRUMINTATION	EE3306	
	※	※		※	※	※		※	※	※	※	※	※	※	※	أساسي	Laboratory	EE3307	
※	※	※	※	※	※	※	※	※		※	※	※	※		※	أساسي	Industrial Electronic	EE4301	الرابع
※	※		※	*	※	※	※		※	※	※		※	※	※	أساسي	DATA TRANSMISSION& COMPUTER ETWORKS	EE4302	
※		※	※	*	※	※	※	※	※	※		※	※		※	أساسي	Microprocessor & Micro Controller	EE4303	
※	※	※	※	*	※	※	※	※	※	※	※	※	※	※	※	أساسي	Microelectronics	EE4304	

※	※	※		*	※	※	※	※	※	※	※	※	※	※	※	أساسي	Microwave Engineering	EE405	
※	※	※	※	※	※	※	※	※		※		※	※	※	※	أساسي	Computer aided design	EE4306	
※	※	※	※	*	※	※	※	※	※	※	※	※	※	※	※	أساسي	Engineering Project	EE4201	
※	※	※	※	*	※	※	※	※	※	※		※	※	※	※	أساسي	Laboratory	EE4307	

وصف المقررات

Courses specification

للعام الدراسي ٢٠٢٣ ـ ٢٠٢٤

جامعة نينوى

كلية هندسة الالكترونيات

قسم هندسة الالكترونيك

Courses specification for first class (First Course)

Module Information					
Module Title	**D.C Circuits Analysis**			**Module Delivery**	
Module Type	**Base**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEE215				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	1		**Semester of Delivery**	1	
Administering Department			**College**		
Module Leader	Zahraa Siddiq Yahya		**e-mail**		
Module Leader's Acad. Title	Lecturer assistant		**Module Leader's Qualification**		
Module Tutor	Zahraa Siddiq Yahya		**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			
Prerequisite module		**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	1. To identify the basic concepts of DC Electrical Eng. circuits.

	2. To understand how is the calculation of current, voltage, and power. 3. To understand and cover the basic DC circuit analysis methods and theorems.
Module Learning Outcomes	1. Explain the function of each element in DC Electrical circuits. 2. Use the basic circuit analysis methods and theorems to simplified the DC Electrical circuits. 3. Explain the different between transformation methods. 4. Applying the appropriate analysis method to reach the aim in its simplest form.
Indicative Contents	Indicative content includes the following. Part A – BASIC CONCEPTS: Voltage & current; Power & Energy; Dependent and Independent sources; Ohm's laws series & parallel connections; Delta- star connections and transformations. [15 hrs] Part B - D.C. Network Theorems: Source transformation; Linearity & superposition; Thevenin's & Norton's Theorems; Source transportation; source superposition; Nodal analysis; Mesh analysis. [35 hrs]

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

Student Workload (SWL)			
Structured SWL (h/sem)ل	30	**Structured SWL (h/w)** ا	4
Unstructured SWL (h/sem)	30	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	**60**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	20% (20)	[3,6,9,12]	LO (#1- #12)
	Assignments	1	10% (10)	14	LO #4, #7, #(10-13)
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	12	LO #11
Summative assessment	**Midterm Exam**	1.5 hr	10% (10)	10	LO #(1-8)
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Voltage & current
Week 2	Power & Energy
Week 3	Dependent and Independent sources
Week 4	Ohm's laws
Week 5	series & parallel connections
Week 6	Delta- star connections and transformations
Week 7	Kirchhoff's Current & Voltage Laws (KCL), (KVL)
Week 8	Source transformation
Week 9	Linearity & superposition
Week 10	Nodal analysis
Week 11	Mesh analysis
Week 12	Thevenin's Theorem
Week 13	Norton's Theorem
Week 14	Max. power transfer
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	**" Engineering Circuit Analysis"** By W. Hayt	Yes
Recommended Texts	**“Introductory Circuit Analysis”** By Boylested	Yes

Grading Scheme

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 Information

Module Title	**Computer science**	**Module Delivery**	
Module Type	**Core**		☐ **Theory**
Module Code	**NVEEELM114**		☒ **Lecture**
ECTS Credits	٤		X **Lab**
SWL (hr/sem)	**100**		**Tutorial**
			Practical
			☐ **Seminar**

Module Level	1	**Semester of Delivery**	1
Administering Department	ELM	**College**	NE
Module Leader	Asmaa Nabeel	**e-mail**	**asmaa.khaleel@uoninevah.edu.iq**
Module Leader's Acad. Title	Lecturer Assist	**Module Leader's Qualification**	M.Sc.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	4/7/2023	**Version Number**	1.0

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	**General overview of personal computer architecture** **Computer peripherals, keyboard, screen, mouse, and storage media** **Computer busses, ports, interfaces** **Overview of MSDOS operating system** **MSDOS internal commands** **MSDOS external commands** **Introduction to computer languages** **Overview of windows operating system** **Windows desktop, changing settings, starting programs** **Creating, deleting, copying, moving, searching for files and folders** **Using my computer, my document, and help facility** **Using windows control panel** **Using the windows accessories paint, notepad, word pad, …..etc** **Setup applications to windows, remove applications from windows** **Connecting to the internet, using the windows explorer** **Using the Microsoft Word** **Using the Microsoft Excel** **Using the Matlab**
Module Learning Outcomes	1.Understanding the important components of the computer and its operating system. 2. Understanding the meaning of MSDOS operating system and its commands. 3. Understanding the windows operating system 4. Understanding the Microsoft office (word, power point, excel). 5. Understanding the high and low level languages 6. Learn about how the strings represented in C language. 7. introduction to matlab
Indicative Contents	1. explain the components of computer hardware and software 2.introduction to the types of computers 3. storage media 4. computer ports 5. computer networks and the types of it 6. the internal and external MSDOS commands 7. windows operating system 8. word office program 9.power point office program 10. Excel program 11. Matlab

Learning and Teaching Strategies

Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)

Structured SWL (h/sem)	125	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	65	**Unstructured SWL (h/w)**	2
Total SWL (h/sem)	190		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10% (10)	٢, 4, 5,6	LO #1, 2, 10 and 11
	Assignments	1	10% (10)	14	LO # 3, 4, 6 and 7
	Projects / Lab.	٠	٠	٠	LO # 3, 4, 6 and 7, 5, 8 and 10
	Report	١	٢٠	١٤	
Summative assessment	**Midterm Exam**	١.5hr	30% (20)	10	LO # 1-4
	Final Exam	3hr	50% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	**Introduction to** the part of computers in hardware and software ,computer types, storage media
Week 2	**Explain the computer ports , computer networks**
Week 3	**Introduction to MSDOS operating system and the internal commands of it**

Week 4	**External Ms DOS command , file and folder related commands and the editor**
Week 5	Windows operating system
Week 6	Windows orders(change the background, screen saver, resolution), change the status of files, printing files, copy and save of files, backups, Recycle bin ,compressing files, viruses
Week 7	Microsoft office word (creating new word file, bars , types and styles of fonts, copy and select of texts ,save of word file)
Week 8	MS WORD: spell checking, inserting symbols, add borders, change the document setup , insert table, page numbering, insert equations and effects)
Week 9	MS Power point:(how to design professional presentation, change the layout of presentation and background of it, numbering slides, insert charts , insert table and audio)
Week 10	MS Power point(insert an effect to the object in slide, transition between slides , grouping of objects, insert equation, copy ,save and printing the slides then how to start the presentation)
Week 11	MS EXCEL (getting started with excel, how to create a spreadsheet, copy and rename the work book, entering and deleting of data in sheet, insert and delete of rows& columns, selecting cells, adding border to sheet)
Week 12	MS EXCEL:how to write a formule in sheet, functions, summation of data in row or column ,average function, max& min functions, count& counta, round function, save and print the spread sheet
Week 13	Overview of High &Low level languages
Week 14	**Matlab**
Week 15	
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1-15	The application of each part of the covered drawing subject theoretically and according to the weekly sequence of the curriculum in the AutoCAD laboratory **Note: By two hours a week**

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	1.“**Computer Science”**	No
Recommended Texts	**2.''MATLAB Handbook”**	No
Websites	https://www.tutorialsmate.com/2021/12/parts-of-computer https://www.koenig-solutions.com/matlab-programming	

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

Module Title	Mathmatics1	**Module Delivery**	
Module Type	Base	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NVEE206**		
ECTS Credits	٦		
SWL (hr/sem)	**150**		

Module Level	1	**Semester of Delivery**	1
Administering Department	Electronic Eng. Dep.	**College**	Electronics Engineering
Module Leader	Hani M. S. Salman	**e-mail**	hani.mohamed@uoninevah.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	**Module Leader's Qualification**	MSc
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date		**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

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

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

Module Objectives أهداف المادة الدراسية	4. Gain proficiency in differentiating trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function. 5. Master differentiation techniques for various types of functions. 6. To learn how to sketch curves and to deal with the transcendental functions. 7. To increase the skills related to differentiation applications. 8. Develop a strong foundation in Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function.

	9. Understand the concept of Application of the definite integral, including finding volumes of revolution, lengths of curves, and surface areas of revolution. 10. To learn the methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. 11. Apply calculus principles to solve real-world engineering problems, developing problem-solving skills and the ability to apply calculus concepts to practical situations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the concept of differentiation as a rate of change and slope of the curve. 2. Understand the basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions. 3. Learn the applications of differentiation. 4. Solve Maximum and Minimum problems. 5. Learn how to Plot the Curve. 6. Learn Transcendental functions: graphs, and derivative. 7. Understand the concept of integration: types of integrals. definite integrals, infinite Integrals. Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function. 8. Apply definite integration to as areas between curves, volumes of revolution, length of the curve and surface area of revolution. 9. Learn Methods of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. 10. Develop critical thinking and problem-solving skills by applying calculus.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Differentiation:</u> Definitions and notations, basic differentiation rules, chain rule, implicit differentiation, higher order differentiation, partial differentiation, Differentiation of trigonometric functions and Hyperbolic Functions: . Applications of differentiation – slope tangents and normal, rate of change, velocity and acceleration, maxima and minima and inflexion points, and Curve plotting. [16 hrs] Transcendental Functions – definitions, properties, graphs, derivative. [4 hrs] <u>Part B – Integration:</u> Definitions and notations, types of integrals: definite integrals, infinite Integrals. Integration of trigonometric function, inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function. [12 hrs]

	Application of the definite integral – areas between curves, volumes of revolution, length of the curve and surface area of revolution. [12 hrs] Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions. [16 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This module's major aim is to foster student engagement, improve critical thinking abilities, and promote collaborative learning. Interactive seminars, interesting tutorials, and exercises encourage active participation, allowing students to hone their critical thinking skills and apply engineering mathematics principles to problem solving. Furthermore, students collaborate on engineering mathematics issues, examine real-world scenarios, and explore the practical applications of the principles acquired through group activities, projects, and conversations. This method not only increases students' comprehension of engineering mathematical concepts, but it also fosters cooperation, communication, and key interpersonal skills that will be useful in their future engineering activities.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	30% (30)	5 and 10	LO #1 #2 #3 and #4, #7, #8
	Assignments	1	10% (10)	12	LO #7 - #9
	Projects / Lab.	-	-	-	-
	Report	-	-	-	-
	Midterm Exam	2hr	10% (10)	7	LO #1 - #6

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction – Differentiation definitions and notations, review of basic differentiation rules, chain rule, and Implicit differentiation.
Week 2	Partial differentiation and higher order differentiation.
Week 3	Differentiation of trigonometric functions and Hyperbolic Functions. Applications of differentiation; slope, tangents and normal.
Week 4	Rate of change, velocity and acceleration, maxima and minima, inflexion points and Curve plotting
Week 5	Transcendental Functions – definitions, properties, and graphs, derivative.
Week 6	Definitions and notations of integration, Types of integrals: definite integrals and infinite integrals. Integration of trigonometric function.
Week 7	Integration of inverse trigonometric function, hyperbolic function. Mid-term Exam
Week 8	Integration of inverse trigonometric function, hyperbolic function, natural logarithm, exponential function, and general exponential function.
Week 9	Application of the definite integral – areas between curves, volumes of revolution, length of the curve and surface area of revolution.
Week 10	
Week 11	
Week 12	Methods Of Integration – Trigonometric Substitutions, Quadratics, Partial fractions, Integration by parts, and Further Substitutions.
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	G. B. Thomas Jr., M. D. Weir, J. Hass, and F. R. Giordano, "Thomas' Calculus," 12th ed., Pearson, 2019.	Yes
Recommended Texts		
Websites	https://www.coursera.org/learn/introduction-to-calculus#syllabus https://www.edx.org/learn/calculus https://www.khanacademy.org/math/calculus-1	

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

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 Information

Module Title	**Physical Electronics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEE218				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Electronic		**College**	Ninevah university	
Module Leader	Hamsa Fawaz Thanoon		**e-mail**	hamsa.thanoon@uoninevah.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	M.Sc	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date	04/07/2023		**Version Number**	1.0	

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	1. To develop problem solving skills and understanding of Atomic Structure 2. To understand Energy band structure of metal, insulator, and semiconductor.

	3. To understand Properties of intrinsic P and N type semiconductors. 4. To understand Electrical conduction in intrinsic semiconductor. 5. To understand Properties of extrinsic semiconductors. 6. To understand Electrical conduction in extrinsic semiconductor
Module Learning Outcomes	1. Recognize how semiconductors works in electronics circuits. 2. List the various terms associated with electronics circuits. 3. Summarize what is meant by a basic of semiconductors. 4. Discuss the reaction and involvement of semiconductors in generate the currents. 5. Describe mobility of electrons and conductivity in metals. 6. Define Ohm's law. 7. Identify the pure semiconductors. 8. Identify the impure semiconductors 9. Discuss the impure semiconductors N and P types 10. Explain the type of electronic emission.
Indicative Contents	Indicative content includes the following. Part A - Energy Bands in Solids Describe the structure of an atom ◆ Discuss insulators, conductors, and semiconductors and how they differ. [9 hrs] Revision problem classes [3 hrs] Part B - Transport Phenomena in Semiconductor Describe how current is produced in a semiconductor ◆ Describe the properties of n-type and p-type semiconductors. [30 hrs]

Learning and Teaching Strategies	
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.

Student Workload (SWL)

Structured SWL (h/sem)	111	**Structured SWL (h/w)**	3
Unstructured SWL (h/sem)	65	**Unstructured SWL (h/w)**	2
Total SWL (h/sem)	**176**		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10	[2,4,5,6]	LO (#1- #12)
	Assignments	2	10	14	LO #4, #7, #(10-13)
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	12	LO #11
Summative assessment	**Midterm Exam**	1.5 hr	20% (20)	10	LO #(1-8)
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Energy Bands in Solids
Week 2	Fermi-Dirac distribution function
Week 3	Properties of intrinsic P and N type semiconductors
Week 4	Mobility and conductivity
Week 5	Electrical conduction in intrinsic semiconductor
Week 6	Hall Effect
Week 7	Generation and recombination of charges
Week 8	Diffusion current continuity equation
Week 9	Injection minority carrier charges
Week 10	N-type semiconductor
Week 11	Solved problems
Week 12	P-type semiconductor
Week 13	Solved problems
Week 14	Photo-conductivity
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1.“NTEGRATEDELECTRONICS"ByMILLMAN&HALKIES 2. “SEMICONDUCTOR DEVICES & CIRCUITS" ،JOHN WILEY & SONS	Yes
Recommended Texts	1. (Floyed) 2. ثيراجا فصل ٥١	Yes

Grading Scheme

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 Information

Module Title	**Mechanical Engineering Principle**	**Module Delivery**	
Module Type	**Base**	☐ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEE203		
ECTS Credits	6		
SWL (hr/sem)	**150**		

Module Level	1	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader		**e-mail**	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	2/07/2023	**Version Number**	1.0

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	Students will be able to: 1. Students will be able to: 2. Knowing the different methods of making calculations related to forces and their effects on two- and three-dimensional systems 3. Clarify that the subject represents a very important introduction to other subjects for the later stages of the student's study and building a scientific base for the student to ensure the possibility of understanding the relevant subjects in the later stages. 4. The student will learn different applications of commonly used Mechanical machinery. 5. The student will learn strong basics of Mechanical Engineering fundamentals.
Module Learning Outcomes	1. Have understood and overcome any misconceptions about basic concepts in physics (force, energy, work etc). 2. Restate existing problem solving skills in a form more suitable for engineering applications. 3. Interpret basic engineering applications of mechanics in more detail. 4. Acquire four basic thinking skills: 1. Perceive, or resolve, contradictions involving their preconceptions about mechanics. 2. Organize the basic ideas of mechanics in a form suitable for problem solving. 3. Apply basic principles in mechanics to realistic engineering situations. 4. Solve realistic engineering problems.
Indicative Contents	**Indicative content includes the following:-** **Statics – Introduction [25 hrs]** ○ Vectors ○ Newton's Laws ○ Fundamental Units ○ Types of force ○ Parallelogram law ○ Resultant forces ○ Moments and couples ○ Moment of couples ○ Eequilibriums ○ Free body diagram ○ Coplanar system ○ Friction: Nature of friction; Theory of friction; Coefficient of friction **Dynamics – Introduction [20 hrs]** ○ Basic concepts ○ Newton's Laws ○ Formulation and solution of problems ○ Kinematics of Particles ○ Rectilinear motion

	○ Curvilinear motion ○ Relative motion ○ Kinetics of Particles ○ Newton's second Law ○ Work and energy -

Learning and Teaching Strategies

Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)

Structured SWL (h/sem)	25	**Structured SWL (h/w)**	2
Unstructured SWL (h/sem)	20	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	45		

Module Evaluation

As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	6	5% (5)	٢, ٥, ٩١٥,13,12,	LO #1, 2, 10 and 11
	Assignments	6	5% (5)	٢, ٥, ٩١٥,13,12,	LO # 3, 4, 6 and 7
	Projects / Lab.	0	0%		
	Report	0	0%	0	
Summative assessment	**Midterm Exam**	3hr	30% (30)	10	LO # 1-7
	Final Exam	3hr	60% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	**Material Covered**
Week 1	Force system; Units system;

Week 2	Parallelogram law; Forces + components
Week 3	Resultant of coplanar forces
Week 4	Components of force in space
Week 5	Moment of a force
Week 6	Moment of a force
Week 7	Moment of a force
Week 8	Free body diagram; Coplanar system
Week 9	Friction: Nature of friction; Theory of friction
Week 10	Coefficient of friction
Week 11	Coefficient of friction
Week 12	Coefficient of friction
Week 13	Normal and tangential components of acceleration
Week 14	Normal and tangential components of acceleration
Week 15	
Week 16	Normal and tangential components of acceleration

Learning and Teaching Resources

	Text	**Available in the Library?**
Required Texts	1. Engineering Mechanics (statics) By: J.L. MERIAM 2. Engineering Mechanics (Dynamics) By: J.L. MERIAM	Yes
Recommended Texts	➢	No
Websites		

Grading Scheme

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

Module Title	**Democracy and Human Rights**		**Module Delivery**	
Module Type	**Basic**		☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NV12**			
ECTS Credits	**2**			
SWL (hr/sem)	**50**			
Module Level	1	**Semester of Delivery**	1	
Administering Department	Dept. of Electronic	**College**	EE	
Module Leader	Husham swadi hashim	**e-mail**	Husham.hashim@uoninevah.edu.iq	
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	PHD	
Module Tutor		**e-mail**		
Peer Reviewer Name		**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	١ – شرح مفهومي حقوق الانسان والديمقراطية ٢ – بيان اهمية حقوق الانسان في حياتنا العامة وعلى جميع الصعد (الدراسية و الوظيفية و الاجتماعية ..الخ) ٣ – بيان اهمية ايجاد مفهوم واعي لمصطلح الديمقراطية ضمن انظمة الحكم وتاثيرها على الاستقرار السياسي ٤ – ضرورة فهم الترابط الوثيق مابين حقوق وبناء مجتمع ديمقراطي يضمن حرية افرادة وضمان مصالحهم ٥– ضرورة التركيز على ان بناء مفهوم حفيفي لحقوق الانسان ومجتمع ديمقراطي لا يكون الا من خلال ين قوانين تضمن ذلك واهمية هذه القوانين في بناء مجتمع مستقر يضمن لجميع افرادة حقوقهم ضمن نظام سياسي ديمقراطي
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١ – ترسيخ قيم الحرية والمساواة في اسس المشاركة الفعلية في بناء المجتمع ٢ – العمل على بناء بيءة حقيية مستقرة من خلال تطبيق القوانين ضمن مجتمع ديمقراطي ٣ – والسعي لتوفير اسس لحماية الافراد ضمن المجتمعات الديمقراطية
Indicative Contents المحتويات الإرشادية	-القسم الأول:– التطور التاريخي لحقوق الإنسان أولا:– المجتمعات البدائية - مرحلة ما قبل التاريخ

- الحضارات الشرقية (بلاد وادي الرافدين والحضارة الفرعونية نموذجاً) (نموذجاً – الحضارات الغربية (اليونانية والرومانية ثانيا:– الشرائع السماوية - الديانة اليهودية - الديانة المسيحية - الديانة الإسلامية(بصوره أكثر تفصيلاً) ثالثاً:– تطور حقوق الانسان في القوانين الوضعية نظرية العقد الاجتماعي - -الحروب العالمية وأثرها في حقوق الانسان - التنظيم الدولي القسم الثاني :– حقوق الإنسان التعريف بها وأنواعها أولا– التحديد والتعريف - الحق في الفقه الإسلامي - الحق في الفقه القانوني - تعريف حقوق الإنسان ثانياً– تقسيمات حقوق الإنسان (وتتم بدراسة مفصلة ومقارنة بين القانون والشريعة الإسلامية) الحقوق الجماعية(حق تقرير المصير, حق التنمية, الحق في بيئة مناسبة, حق الإنسان في العيش بسلام)- الحقوق الفردية (الحقوق الاقتصادية والثقافية, الحقوق المدنية والسياسية الحقوق الصيغة بالشخصية)- القسم الثالث:– ضمانات احترام وحماية حقوق الإنسان أولا – الضمانات في الشريعة الإسلامية ثانياً:– الضمانات على الصعيد الوطني ثالثا:– الضمانات على الصعيد الدولي مفردات ماده الديمقراطية الكورس الأول:– يتضمن ماده الحريات العامة بين الشريعة والقانون الكورس الثاني:– يتضمن ماده نظم إدارة الدولة بين الشريعة والقانون الحريات العامة (بين الشريعة والقانون) أولا:– المقدمة ثانياً:– التعريف بالحريات العامة - الأصل اللغوي	

- الأصل التاريخي - الأساس القانوني - الأساس الشرعي ثالثا:- أسس الحريات العامة - العدالة - المساواة - الحرية رابعاً:- الحريات العامة الو صفية - حرية الرأي - حرية الفكر - حرية الأعلام - المسا واه خامساً:- الشريعة الإسلامية والحريات العامة - موقف الإسلام من المرأة (الميراث, الزواج, تولي الوظائف) - موقف الإسلام من حرية العقيدة نظم إدارة الدولة أولا:- في تحديد النظم السياسية - فكره النظام السياسي - شرعية النظم السياسية - أنواع النظم السياسية ثانياً:- في النظام الديمقراطي - مقدمة تأصيلية - تعريف الديمقراطية -أركان ومرتكزات النظام الديمقراطي ثالثاً:- نماذج الديمقراطية - الديمقراطية المباشرة	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
اتباع طريقة التعليم المباشر من خلال عرض المادة وشرحها والاستعانة بالادوات التعليمية لشرحها من خلال توضيح اليات المفهوم العلمي لمصطلحي الديمقراطية و حقوق الانسان	**Strategies**

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	16	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	9	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	25		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	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	التطور التاريخي لحقوق الانسان
Week 2	الشرائع السماوية
Week 3	تطور حقوق الانسان في القوانين الوضعية
Week 4	حقوق الانسان التعريف بها وانواعها
Week 5	ضمانات احترام وحماية حقوق الانسان
Week 6	الضمانات في الشريعة وعلى الصعيدين الوطني والدولي
Week 7	Mid-term Exam
Week 8	مفهوم الديمقراطية
Week 9	الحريات العامة بين الشريعة و القانون
Week 10	التعريف بالحريات العامة و اسس الحريات
Week 11	الشريعة الاسلامية والحريات العامة
Week 12	نظم ادارة الدولة
Week 13	الديمقراطية مقدمة تأصيلية
Week 14	اركان ومرتكزات النظام الديمقراطية

Week 15	نماذج الديمقراطية
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		

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.

Courses specification for first class (Second Course)

Module Information					
Module Title	**Digital Techniques**			**Module Delivery**	
Module Type	**Base**			☒ **Theory**	
Module Code	**NVEE217**			☒ **Lecture**	
ECTS Credits	**5**			☐ **Lab**	
SWL (hr/sem)	**125**			☒ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Level	1		**Semester of Delivery**	2	
Administering Department			**College**	Type College Code	
Module Leader	(Younis Saber Othman), (Noor Alhuda Saad Abbas)		**e-mail**		
Module Leader's Acad. Title	Lecturer Assistant		**Module Leader's Qualification**	M.Sc.	
Module Tutor			**e-mail**		

Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	4/7/2023	**Version Number**	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	1. To learn new number systems and how to convert between them 2. To identify and learn the logic gates and Boolean algebra 3. How to minimize the Boolean functions using Boolean algebra and Karnaugh maps 4. To understand, draw, and identify the combinational logic circuits using the discrete logic 5. To understand, draw, and identify the combinational logic circuits using the MSI integrated circuits 6. To use the 3-varaiables and 4-varaiables Karnaugh map for Boolean minimization
Module Learning Outcomes	Students will be able to: 1. Learning new number systems and how to convert between them 2. Identify the logic gates and learn the Boolean algebra 3. Minimize the Boolean functions 4. Understand, draw, and identify the combinational logic circuits using the discrete logic and MSI integrated circuits 5. Identify and use the 3-varaiables and 4-varaiables Karnaugh map
Indicative Contents	**Indicative content includes the following:-** **NUMBER SYSTEMS:- [10 Hrs]** Decimal number system; Binary; Octal and hexadecimal number systems; Conversion from one number to another number system; Addition; Subtraction; Multiplication and division using different number system; Representation of binary number insignia-magnitude; Sign 1's Complement and align 2's complement notation; Rules for addition and subtraction with complement Representation; BCD; EBCDIC; ASCII; Extended ASCII; Gray and other codes. **LOGIC GATES AND BOOLEAN ALGEBRA:- [10 Hrs]** AND; OR; NOT; NAND; NOR; Ex-OR logic gates; Positive and negative logic; Fundamental concepts of Boolean algebra; De-murrage's laws; Principles of duality; Simplification of Boolean expressions; Canonical and standard forms for Boolean function; SOP and POS, forms; Realization of Boolean functions using only NAND and NOR gates. **BOOLEAN FUNCTION MINIMIZATION:- [10 Hrs]** Objectives of the minimization procedures; Karnaugh map method; The 3-Variable Karnaugh Map; The 4-Variable Karnaugh Map; Karnaugh Map SOP Minimization; Don't care conditions; Karnaugh Map POS Minimization; Converting Between POS and SOP Using the Karnaugh Map. **COMBINATIONAL LOGIC CIRCUITS USING DISCRETE LOGIC GATES:- [5 Hrs]** Parity generator and checker; Code converters; Majority circuits; magnitude comparator.

	COMBINATIONAL LOGIC CIRCUIT USING MSI INTEGRATED CIRCUITS:- [10 Hrs] Encoder; priority encoder; decoder; Multiplexer and demultiplexer circuits; Implementation of Boolean functions using decoder and Multiplexer; BCD to 7-segment decoder; Common anode and common cathode 7-segment displays; Random access memory; Read only memory and erasable programmable ROMS

Learning and Teaching Strategies

Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)

Structured SWL (h/sem)	45	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	45	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	90		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	1-14	LO #1-14
	Assignments	1	5% (5)	6	LO # 1-6
	Projects / Lab.	10 Lab	10% (10)	5-14	LO # 5-14
	Report	3	5% (5)	5-14	LO # 5-14
Summative assessment	**Midterm Exam**	1.5hr	20% (20)	10	LO # 1-10
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered

Week 1	**NUMBER SYSTEMS:-** Decimal number system; Binary; Octal and hexadecimal number systems; Conversion from one number to another number system; Addition; Subtraction; Multiplication and division using different number system; Representation of binary number insignia-magnitude; Sign 1's Complement and align 2's complement notation; Rules for addition and subtraction with complement Representation; BCD; EBCDIC; ASCII; Extended ASCII; Gray and other codes.
Week 2	
Week 3	
Week 4	**LOGIC GATES AND BOOLEAN ALGEBRA:-** AND; OR; NOT; NAND; NOR; Ex-OR logic gates; Positive and negative logic; Fundamental concepts of Boolean algebra; De-murrage's laws; Principles of duality; Simplification of Boolean expressions; Canonical and standard forms for Boolean function; SOP and POS, forms; Realization of Boolean functions using only NAND and NOR gates.
Week 5	
Week 6	
Week 7	**BOOLEAN FUNCTION MINIMIZATION:-** Objectives of the minimization procedures; Karnaugh map method; The 3-Variable Karnaugh Map; The 4-Variable Karnaugh Map; Karnaugh Map SOP Minimization; Don't care conditions; Karnaugh Map POS Minimization; Converting Between POS and SOP Using the Karnaugh Map.
Week 8	
Week 9	
Week 10	
Week 11	**COMBINATIONAL LOGIC CIRCUITS USING DISCRETE LOGIC GATES:-** Parity generator and checker; Code converters; Majority circuits; magnitude comparator.
Week 12	
Week 13	**COMBINATIONAL LOGIC CIRCUIT USING MSI INTEGRATED CIRCUITS:-** Encoder; priority encoder; decoder; Multiplexer and demultiplexer circuits; Implementation of Boolean functions using decoder and Multiplexer; BCD to 7-segment decoder; Common anode and common cathode 7-segment displays; Random access memory; Read only memory and erasable programmable ROMS
Week 14	
Week 15	
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 5-14	Introduction to KL-31001 DIGITAL LOGIC LAB Exp. 1: Logic Gates Exp. 2: NAND, NOR, XOR Gates Exp. 3: AND-OR-INVERTER(A-O-I) Circuits Exp. 4: Bit Parity Generator Circuits Exp. 5: Comparator Circuits Exp. 6: Decoder Exp. 7: Encoder Exp. 8: Multiplexer Exp. 9: Demultiplexer

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	**Digital Fundamentals** | Eleventh Edition Global Edition | by Thomas L. Floyd | Pearson Education 2015	PDF
Recommended Texts	**Logic and Computer Design Fundamentals** | Fifth Edition Global Edition | by Morris Mano • Charles R. Kime • Tom Martin | Pearson Education 2016	PDF
Websites	(Telegram Group and Google classroom)	

Grading Scheme

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

Module Title	**A.C circuits Analysis**	**Module Delivery**	
Module Type	**Base**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEE216		
ECTS Credits	5		
SWL (hr/sem)	125		

Module Level	1	**Semester of Delivery**	2
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Zahraa Siddiq Yahya	**e-mail**	
Module Leader's Acad. Title	Lecturer assistant	**Module Leader's Qualification**	
Module Tutor	Zahraa Siddiq Yahya	**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

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

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	12. To identify the basic concepts of energy storage elements. 13. To identify the basic of Alternating Current AC. 14. To understand and cover the basic AC circuit analysis methods and theorems.

Module Learning Outcomes	11. Explain the function of each element in AC Electrical circuits. 12. Use the basic circuit analysis methods to simplified the AC Electrical circuits. 13. Applying the appropriate analysis method to reach the aim in its simplest form.
Indicative Contents	Indicative content includes the following. Part A – energy storage elements: The capacitor; The Inductor; Analysis of RC-transient circuits; Analysis of RL-transient circuits; RLC transient circuits. [15 hrs] Part B - A.C. circuit analysis: the basic of Alternating Current AC; The Phasor equivalent circuit; series & parallel connections and equivalent impedance; Methods of Ac-circuit Analysis; superposition; Nodal & Mesh analysis; Thevenin's Theorem; Norton's Theorem; Power factor and average power in the sinusoidal Ac-circuits; Complex power; Series & parallel resonance. [35 hrs]

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

Student Workload (SWL)

Structured SWL (h/sem)ل	30	**Structured SWL (h/w)** ا	4
Unstructured SWL (h/sem)	30	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	**60**		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	[3,6,9,12]	LO (#1- #12)
	Assignments	1	10% (10)	14	LO #4, #7, #(10-13)
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	12	LO #11
Summative assessment	**Midterm Exam**	1.5 hr	10% (10)	10	LO #(1-8)
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered

Week 1	The capacitor & The inductor
Week 2	Analysis of RC & RL -transient circuits
Week 3	Analysis of RLC transient circuits
Week 4	The basic of Alternating Current AC
Week 5	The Phasor equivalent circuit
Week 6	series & parallel connections and equivalent impedance
Week 7	Methods of Ac-circuit Analysis
Week 8	superposition
Week 9	Nodal & Mesh analysis
Week 10	Thevenin's Theorem
Week 11	Norton's Theorem
Week 12	Power factor and average power in the sinusoidal Ac-circuits
Week 13	Complex power
Week 14	Series & parallel resonance
Week 15	**Preparatory week before the final Exam**

Learning and Teaching Resources

	Text	**Available in the Library?**

Required Texts	**" Engineering Circuit Analysis"** By W. Hayt	Yes
Recommended Texts	**"Introductory Circuit Analysis"** By Boylested	Yes

Grading Scheme				
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 Information
معلومات المادة الدراسية

Module Title	**Engineering Drawing**	**Module Delivery**	
Module Type	Core	☐ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	NVEE201		
ECTS Credits	5		
SWL (hr/sem)	125		

Module Level	1	**Semester of Delivery**	2
Administering Department		**College**	
Module Leader	Noor Yassar	**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 Objectives أهداف المادة الدراسية	Students will be able to: 6. Drawing engineering shapes manually and clearly, including the effective use of the computer-aided drawing program (AutoCAD). 7. Develop a solid understanding of the basic principles of engineering drawing, Included the ability to work with concepts, analytically, and

	visualize them and a functional understanding of how these ideas will manifest in the real world. 8. Determine the strategies to be used and the assumptions to be made. 9. Use both manual and computer approaches in drawing figures. 10. Develop the ability to use engineering tools flexibly and creatively. 11. Develop an integrated understanding of the AutoCAD module. 12. Developing their ability to communicate scientific ideas. 13. Develop expertise in experimental methodologies.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	14. Understand and apply the basics of drawing types of lines. 15. Define, explain and apply engineering drawing operations. 16. Understand the basics of drawing an ogee curves 17. Understand and apply the basic idea of central projection theory. 18. Explanation of the central and parallel projection theory to understand the projection process. 19. Explain Different Views are Front View (FV), Top View (TV) and Side View (SV) FV is a view projected on VP. TV is a view projected on HP. SV is a view projected on PP. 20. Ability to draw using AutoCAD.
Indicative Contents المحتويات الإرشادية	**Introduction to engineering drawing and its tools** Introduction and introducing students to the subject of engineering drawing, which includes Identification of engineering tools and how to use them. **Engineering shapes and the arcs , lamina. , Dimensions:** - Various engineering operations: - - Drawing a straight line parallel to a known straight line - The division of the rectum into two halves - Angle division is known. - Drawing a straight line parallel to a known straight line from a point that does not belong to the known straight line. - Draw a tangent to a circle from a point that does not belong to it. - Draw a tangent to two contiguous circles from the outside. - Draw a tangent to two contiguous circles from the inside **Multi view projection** - Perpendicular Projection Theory of Objects: - Types of projections resulting from vertical projection and approved in the projection of various engineering objects - Front view - Side view. - Top view **Using AutoCAD** - Apply everything that has been explained in the manual engineering drawing on the AutoCAD program and drawing the three-dimensional models

Learning and Teaching Strategies استراتيجيات التعلم والتعليم

Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	55	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.7
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**	6	20% (20)	5 and 10	LO #1, 2, 10 and 11
	Assignments	3	10% (10)	2 and 12	LO # 3, 4, 6 and 7
	Projects / Lab.	3	10% (10)	Continuous	All
	Report	0	0% (0)	0	
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO # 1-4
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction and introducing students to the subject of engineering drawing, which includes identification of engineering tools and how to use them.
Week 2	Teach students how to apply and draw the following engineering operations:

	Drawing a straight line parallel to a known straight line, the division of the rectum into two halves, angle division and drawing a straight line parallel to a known straight line.
Week 3	Teach students how to draw a tangent to two contiguous circles from the outside, Draw a tangent to two contiguous circles from the inside
Week 4	Draw a tangent to one circle from the inside and the other from the outside and draw a tangent to a circle passing through a straight line.
Week 5	Multi view projection Perpendicular Projection Theory of Objects: • Types of projection in drawing and its practical importance
Week 6	Types of projections resulting from vertical projection and approved in the projection of various engineering objects: Front view, Side view ,Top view
Week 7	Mid-term Exam + Introduction to AutoCAD
Week 8	Apply everything that has been explained in the manual engineering drawing on the AutoCAD program and drawing the three-dimensional models
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1-15	The application of each part of the covered drawing subject theoretically and according to the weekly sequence of the curriculum in the AutoCAD laboratory

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	EGINEERING DRAWING AND GRAPHIC TECHNOLOGY", Fourteenth Edition, By: THOMAS E.FRENCH, CHARLES .VIERCK, ROBERT J.FOSTER,McGRAW-HILL	Yes

Recommended Texts	➢ William D.CallisterJr.&David D.Rethwisch.(2010)"Material Science and Engineering An introduction", eightEdition.	No
Websites	ENGINEERING DRAWING Any edition	

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 Information معلومات المادة الدراسية					
Module Title	**MathematicsII**			**Module Delivery**	
Module Type	**Base**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NVEE 207**				
ECTS Credits	٦				
SWL (hr/sem)	١٥٠				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Electronic Eng. Dep.		**College**	Electronics Engineering	
Module Leader	Hani M. S. Salman		**e-mail**	hani.mohamed@uoninevah.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	MSc	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NEEM1211	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To obtain a good knowledge of dealing with complex numbers. 2. Establish a strong foundation in matrices and their operations, determinants, and inverse matrices. This includes covering definitions, notations, properties, types, and basic operations on matrices, enabling effective application in problem-solving. 3. enhancing students' proficiency in matrix-based solutions for linear systems of equations using Cramer's rule, the inverse method, and the Gauss elimination method 4. To provide the students with the knowledge to deal with vectors and their mathematical operations. 5. To Learn about the polar coordinates, and the graphs of polar equations. 6. Apply calculus principles to solve real-world engineering problems, developing problem-solving skills and the ability to apply calculus concepts to practical situations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	21. Comprehend and utilize complex numbers within the Argand diagram, and 22. master complex number operations (Addition, subtraction, product, quotient, power, and roots) and De Moivre's Theorem. 23. Understand the concept of linear algebra and matrices. 24. Identify the types of matrices such as square matrices, zero matrix and identity. 25. Perform the common matrix operations such as addition, subtraction, scalar multiplication, and multiplication. 26. Find the transpose of a matrix. 27. Compute the determinants. 28. Compute the inverse of the matrix. 29. Identify whether the matrix is invertible or singular. 30. Relate a matrix to a homogenous system of linear equation. 31. Solve a system of linear equations by matrices: using Cramer's rule. 32. Solve a system of linear equations by matrices: using the inverse method. 33. Solve a system of linear equations by matrices: using Gauss Elimination Method. 34. Identify the rank of the matrix and its relation to the solution of linear equations. 35. Find the eigenvalues and eigenvectors of a matrix. 36. Represent a vector in space. 37. Compute dot and cross products in vectors. 38. Understand the meaning of del operator, gradient, divergence, and curl and to compute the del operation, gradient, divergence, and curl. 39. Learn about the vector functions.

	40. Convert from Cartesian to Polar coordinates and vice versa. 41. Sketch in polar system. 42. Utilize mathematical reasoning and critical thinking skills to analyze and interpret mathematical concepts and their applications in Electronics engineering. 43. Develop proficiency in mathematical problem-solving, both independently and collaboratively, and communicate solutions effectively.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Review of Complex Numbers:</u> The Argand diagram, Addition, Subtraction; Product, Quotient, power and roots, and Demoiver's Theorem. [4hrs] <u>Part B – Matrices and Determinants:</u> Matrices and Determinants: Definitions and notations, Properties, types of matrices, basic operations on matrices, computation of the determinants of matrices, properties of determinants. [8 hrs] Inverse of the Matrices. [4 hrs] Solution of the system of linear equations-solution of the system of linear equation using Cramer's rule, solution of the system of linear equation using the inverse method. [12 hrs] Revision problem classes [4 hrs] solution of the system of linear equation using Gauss Elimination Method. [4 hrs] Eigenvalues and eigenvector. [4 hrs] <u>Part C – Review of Vectors:</u> Representation of vectors in space (i;j;k), unit vectors, Scalar product, and Vector product. [8 hrs] <u>Part D – Vector Calculus:</u> Vectors – del operator, Parametric Equations of Lines in Space, the distance from a Point to a line in Space, plane equation in space, the Distance from the Point to a Plane, Angles Between Planes, vector function versus Scalar function, del operator, Gradient, Divergence and Curl. [12 hrs] <u>Part E – Polar Coordinates:</u> Polar coordinates – polar coordinate system, transformation between polar and Cartesian coordinates, graphs of polar equations. [4 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	This module's major aim is to foster student engagement, improve critical thinking abilities, and promote collaborative learning. Interactive seminars, interesting tutorials, and exercises encourage active participation, allowing students to hone their critical thinking skills and apply engineering mathematics principles to problem solving. Furthermore, students collaborate on engineering mathematics issues, examine real-world scenarios, and explore the practical applications of the principles acquired through group activities, projects, and conversations. This method not only increases students' comprehension of engineering mathematical concepts, but it also fosters cooperation, communication, and key interpersonal skills that will be useful in their future engineering activities.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.9
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	30% (30)	6 and 14	LO #1 - #11, #16- #19
	Assignments	1	10% (10)	13	LO #12-#15
	Projects / Lab.	-	-	-	-
	Report	-	-	-	-
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #11
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The Argand diagram, Addition, Subtraction; Product, Quotient, power and roots, and Demoiver's Theorem.
Week 2	Matrices and Determinants: Definitions and notations, Properties, types of matrices, basic operations on matrices, computation of the determinants of matrices, properties of determinants.
Week 3	
Week 4	Inverse of the Matrices.
Week 5	Solution of the system of linear equations-solution of the system of linear equation using Cramer's rule.
Week 6	solution of the system of linear equation using the inverse method.
Week 7	solution of the system of linear equation using Gauss Elimination Method.
Week 8	Revision problem classes, Mid-term Exam
Week 9	Eigenvalues and eigenvector. [4 hrs]
Week 10	Representation of vectors in space (i;j;k), unit vectors, Scalar product, and Vector product.
Week 11	
Week 12	Vectors – del operator, Parametric Equations of Lines in Space, the distance from a Point to a line in Space, plane equation in space, the Distance from the Point to a Plane, Angles Between Planes, vector function versus Scalar function, del operator, Gradient, Divergence and Curl.
Week 13	
Week 14	
Week 15	Polar coordinates – polar coordinate system, transformation between polar and Cartesian coordinates, graphs of polar equations.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**"Higher Engineering Mathematics", 7th edition by John Bird**	No
	G. B. Thomas Jr., M. D. Weir, J. Hass, and F. R. Giordano, "Thomas' Calculus," 12th ed., Pearson, 2019.	Yes
Recommended Texts	**"Introduction to Linear Algebra". 4th edition by Strang, Gilbert** **"Linear Algebra for Everyone". 2020 by Strang, Gilbert**	No

	Zill, D. G., Wright, W. S., & Cullen, M. R. (2011). Advanced Engineering Mathematics. Jones & Bartlett Publishers.	
Websites	https://ocw.mit.edu/courses/18-06-linear-algebra-spring-2010 https://www.khanacademy.org/math/linear-algebra https://www.ohio.edu/mechanical-faculty/williams/html/PDF/MatricesLinearAlgebra.pdf	

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

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

Module Information

Module Title	**Physical of semiconductors**	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEE219		
ECTS Credits	6		
SWL (hr/sem)	150		

Module Level	1	**Semester of Delivery**	2
Administering Department	EI	**College**	NE
Module Leader	Hamsa Fawaz Thanoon	**e-mail**	hamsa.thanoon@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc
Module Tutor		**e-mail**	E-mail
Peer Reviewer Name		**e-mail**	E-mail
Scientific Committee Approval Date	04/07/2023	**Version Number**	1.0

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	1. To develop problem solving skills and understanding of Atomic Structure

	2. To understand Energy band structure of metal, insulator, and semiconductor. 3. To understand Properties of intrinsic P and N type semiconductors. 4. To understand Electrical conduction in intrinsic semiconductor. 5. To understand Properties of extrinsic semiconductors. 6. To understand Electrical conduction in extrinsic semiconductor
Module Learning Outcomes	1. Recognize how semiconductors works in electronics circuits. 2. List the various terms associated with electronics circuits. 3. Summarize what is meant by a basic of semiconductors. 4. Discuss the reaction and involvement of semiconductors in generate the currents. 5. Describe mobility of electrons and conductivity in metals. 6. Define Ohm's law. 7. Identify the pure semiconductors. 8. Identify the impure semiconductors 9. Discuss the impure semiconductors N and P types 10. Explain the type of electronic emission.
Indicative Contents	Indicative content includes the following. Part A - Energy Bands in Solids Describe the structure of an atom ◆ Discuss insulators, conductors, and semiconductors and how they differ. [9 hrs] Revision problem classes [3 hrs] Part B - Transport Phenomena in Semiconductor Describe how current is produced in a semiconductor ◆ Describe the properties of n-type and p-type semiconductors. [30 hrs]

Learning and Teaching Strategies	
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.

Student Workload (SWL)

Structured SWL (h/sem)	111	**Structured SWL (h/w)**	3
Unstructured SWL (h/sem)	65	**Unstructured SWL (h/w)**	2
Total SWL (h/sem)	**176**		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	10	[2,4,5,6]	LO (#1- #12)
	Assignments	2	10	14	LO #4, #7, #(10-13)
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	12	LO #11
Summative assessment	**Midterm Exam**	1.5 hr	20% (20)	10	LO #(1-8)
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered

Week 1	PN junction in equilibrium
Week 2	Volt Ampere characteristics; Temperature dependence
Week 3	diffusion capacitance
Week 4	Non-linear properties; Ideal diode; Basic theory and analysis of simple diode circuit; DC load line; Small signal analysis and concept of dynamic resistance; AC load line
Week 5	Diode capacitance ;Temperature effects of diode
Week 6	Different types of diodes (Zener; schottckey);
Week 7	(Varactor diode; Tunnel and negative resistance diodes).
Week 8	Circuit analysis of half wave and full wave rectifiers
Week 9	Bridge rectifier; Ripple and form factor calculations
Week 10	Types of filters; C filters , L filter ,L .C. filter, PIE filter; Analysis of filter and calculation of ripple and regulation.
Week 11	Solved problems
Week 12	Clipping and Clam Ping Circuit:
Week 13	Transistors: PNP; NPN
Week 14	The BJT as an Amplifier
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1: " SOLID STATE DIVICES" ،PHI; 4TH EDITION ،1995.By STREETMAN ، 2: "SEMICONDUCTOR DEVICES & CIRCUITS" ،JOHN WILEY & SONS ،1992.By : M.S. TYAGI 3: " ELECTRONICS DEVICES & CIRCUITS THEORY" ،HI; By BOYLSTED & NASHELSKY	Yes
Recommended Texts	3. (Floyed) 4. ثيراجا فصل ٥١	Yes

Grading Scheme

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 Information
معلومات المادة الدراسية

Module Title	**English**	**Module Delivery**	
Module Type	**Basic**	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NVU11**		
ECTS Credits	**2**		
SWL (hr/sem)	**50**		

Module Level	1	**Semester of Delivery**	2
Administering Department	Dept. of Computer and Information	**College**	College of Electronics Engineering
Module Leader	Noor Mothafar Hamid	**e-mail**	noorm.hame@duoninevah.edu.iq
Module Leader's Acad. Title		**Module Leader's Qualification**	MA
Module Tutor		**e-mail**	
Peer Reviewer Name		**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	7. To develop skills, reading, writing and understanding of English language through the application of teaching techniques. 8. To understand scientific subjects and technical terms through reading and comprehension. 9. This course deals with the basic concepts of scientific subjects. 10. This course handles how to write simple research and how to make a successful presentation. 11. To understand the scientific language in English.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	5. Recognize parts of speech and tenses in English language. 6. List the various terms associated with scientific texts. 7. Summarize what is meant by a basic electric circuit. 8. Discuss Electric currents, series and parallel circuits. 9. Describe electrical power, charge, and current. 10. Discuss computers, communication and the future of computers.. 11. Identify the basic circuit elements and their applications. 12. Explain energy types and forms. 13. Discuss the various properties of radio waves and vacuum tubes. 14. Explain modulation. 15. Discuss Electromagnetism.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1.parts of speech _verb _ noun _ pronoun 2.Tenses _Past _Present _future 3.Electric currents and circuit _AC/DC _parallel, serious _Grounding, fuse, short circuit 4.Radio waves and vacuum tubes 5. Electromagnetism. 6. The future of computers, communication applications. _fiber optics. 7. Induction. _Electric generator _Electric transformer _self-induction _servomechanism 8. Incandescent lamp. 9. Energy. _types of energy _forms of energy 10. Introduction to electron and electricity. 11.Electricity and electronics.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation by reading, writing and comprehension in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, presentation, interactive tutorials, by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Parts of speech
Week 2	Tenses
Week 3	Electric currents and circuit
Week 4	Radio waves and vacuum tubes
Week 5	The future of computers, communication applications.
Week 6	Induction -Electric generator -Electric transformer
Week 7	Mid-term Exam
Week 8	Induction -Self-induction -Servomechanism
Week 9	Incandescent lamp.

Week 10	Energy. -types of energy -forms of energy
Week 11	Introduction to electron and electricity.
Week 12	Electricity and electronics
Week 13	The cathode ray tube
Week 14	Propagation
Week 15	Modulation
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	English in electrical engineering and electronics. The language of electrical and electronic engineering in English.	Yes
Recommended Texts	English for electrical engineering and computing.	No
Websites	https://www.askoxford.com/betterwriting/succesfulcv/application/?view=uk	

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.

Courses specification for Second class Medical Engineering (First Course)

Module Information					
Module Title	Engineering analysisI			**Module Delivery**	
Module Type	Base			☐ **Theory**	
Module Code	NVEE208			☒ **Lecture**	
ECTS Credits	6			☐ **Lab**	
SWL (hr/sem)	150			☒ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	2	**Semester of Delivery**	1		
Administering Department	Electronics dept	**College**	Electronics engineering college		
Module Leader	Dr. Omar B Mohammed	**e-mail**	omar.mohammed@uoninevah.edu.iq		
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date		**Version Number**			

Relation with other Modules			
Prerequisite module	Mathematics II	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	This course covers the following topics: Multiple Integrals, Vectors Functions, Numerical Analysis, Statistics and Probability. Those areas of mathematics which are most important in connection with practical problems for modeling different areas of science, computer can be easily utilized to find the properties of such systems.
Module Learning Outcomes	Upon successful completion, students will: 1. Improve their problem-solving skills. 2. Apply that knowledge toward practical problems in different areas of science. 3. Utilize the computer capabilities to solve such problems using proper methods. 4. Learn how to deal with geometry in 3D; find areas and volumes. 5. Solve ordinary and differential equations numerically. 6. Learn the importance of probability and statistics in everyday use.
Indicative Contents	Vectors Functions Multiple Integrals Numerical Analysis Statistics Probability

Learning and Teaching Strategies	
Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills.

Student Workload (SWL)

Structured SWL (h/sem)		**Structured SWL (h/w)**	
Unstructured SWL (h/sem)		**Unstructured SWL (h/w)**	
Total SWL (h/sem)			

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**				
	Assignments				
	Projects / Lab.				
	Report				
Summative assessment	**Midterm Exam**				
	Final Exam				
Total assessment					

	This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Vectors: Vector in space, dot and cross product. Lines and planes in space. Vector valued functions and motion in space: position, velocity and acceleration, tangential vectors, curvature and normal vector.
Week 2	
Week 3	
Week 4	
Week 5	Multiple Integrals: Double Integral in rectangular coordinates, areas and volumes. Double Integral in Polar Coordinates, areas and volumes. Triple Integrals in rectangular, cylindrical, and spherical coordinates, volumes.
Week 6	
Week 7	
Week 8	
Week 9	Numerical Analysis: Solution of non-linear equations by iteration; bisection and Newton-Raphson. Numerical Integration; trapezoidal rule.
Week 10	
Week 11	

Week 12	Numerical solution of 1st order ordinary differential equations; Euler's method.
Week 13	Statistics and Probability: Definitions, mutually exclusive and conditional probability, permutations and combinations Probability distribution: binomial, normal and Poisson distributions.
Week 14	
Week 15	
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Advanced Engineering Mathematics By KREYSIK	Yes
Recommended Texts	Calculus By Finney& Thomas	Yes
Websites		

Grading Scheme

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

Module Title	Signal Analysis	**Module Delivery**	
Module Type	Core	**Theory** **☒ Lecture** **Lab** **☐ Tutorial** **☐X Practical** **☐ Seminar**	
Module Code	NVEEELM211		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader		**e-mail**	
Module Leader's Acad. Title	Assistant 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	25/06/2023	**Version Number**	1.0

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	Student will be able to: 15. identify signals concepts . 16. understand the classification of signals . 17. understand the different operations on signals.

	18. perform Fourier and Laplace transformations of signals.
Module Learning Outcomes	44. Definition of the signal concept. 45. Introduction of mathematical models. 46. Explain Continuous time signals. Discrete time signals. 47. Categorize the signals. 48. Achieve operations on signals. 49. Introduction of basic signals. 50. Define convolution operation between two signals. 51. Introduction of frequency domain and Fourier analysis. 52. Laplace Transformation.
Indicative Contents	Indicative content includes the following. Introduction to signals: - Definition and mathematical models. - Categorization of signals. - Operation on signals. - Basic types of signals. Convolution operation: - Introduction of convolution. - Convolution properties. Signal transformation: - Fourier series and transform. - Laplace Transform.

Learning and Teaching Strategies	
Strategies	To make students interesting with both types of signals: continuous and discrete. Also with classifications of signals and operations on them. To make them familiar with time and frequency domain and analysis of a signal . Also to make them familiar with different types of transforms of signals. Also to make them have an experience with solving different problems and examples .

Student Workload (SWL)

Structured SWL (h/sem)ل	64	**Structured SWL (h/w)** ا	4
Unstructured SWL (h/sem)	86	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	**150**		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	6	10% (10)	٢, ٥, ٩,12,13,15	LO #1, 2, 10 and 11
	Assignments	6	10% (10)	٢, ٥, ٩,12,13,15	LO # 3, 4, 6 and 7
	Projects / Lab.	6	20% (20)	٢, ٥, ٩,12,13,15	LO # 3, 4, 6 and 7, 5, 8 and 10
	Report	0	0% (0)	0	
Summative assessment	**Midterm Exam**	1.5hr	20% (20)	10	LO # 1-4
	Final Exam	3hr	40% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Basic definitions. Mathematical models.
Week 2	Continuous time signals
Week 3	Discrete time signals
Week 4	Signal classifications
Week 5	Energy and power of signals
Week 6	Basic operations on continuous signals.

Week 7	Basic operations on discrete signals.
Week 8	Time domain representation of continuous signals; sinusoidal and complex exponential signals
Week 9	singularity function signals
Week 10	Convolution definition and operation
Week 11	Convolution properties
Week 12	Frequency domain representation of continuous signals. Spectra and bandwidth of the signal
Week 13	Fourier series representations of periodic signals.
Week 14	Fourier transform representations of non periodic signals.
Week 15	Laplace Transform of continuous signals. Laplace properties.

Learning and Teaching Resources

	Text	**Available in the Library?**
Required Texts	**Signals and Systems. Simon S. Haykin**	Yes
Recommended Texts	**Signals and linear Systems. G. E. Carlson**	

Grading Scheme

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 Information

Module Title	**Electronic I**	**Module Delivery**	
Module Type	**core**		☐ **Theory**
Module Code	**NVEEELM212**		☒ **Lecture**
ECTS Credits	**5**		☐ **Lab**
SWL (hr/sem)	**125**		☒ **Tutorial** ☒ **Practical** ☐ **Seminar**

Module Level	1	**Semester of Delivery**	1
Administering Department	Electronics	**College**	Electronic Engineering college
Module Leader		**e-mail**	
Module Leader's Acad. Title	Assistant Prof.	**Module Leader's Qualification**	PhD
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	Ahmad.younis@uoninevah,edu,iq
Scientific Committee Approval Date	12/06/2023	**Version Number**	1.0

Relation with other Modules

Prerequisite module	NEEI2212	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	12. To understand the basic analysis of bipolar transistor amplifier 13. To be familiar with the dc and ac analysis of transistor amplifier 14. To understand the dc and ac analysis of FET amplifier 15. To illustrate and to understand the frequency response of amplifier 16. To understand the basic concept of feedback concept 17. To be able to deal with different feedback amplifier topologies 18. To study the advantages of negative feedback on amplifier performance 19. To be familiar with feedback amplifier ac analysis 20. To understand the construction and ideal characteristic of operational amplifier 21. To study and analyze op-amp equivalent circuit 22. To be familiar with basic op-amp applications 23. To start with studying power electronic devices
Module Learning Outcomes	16. Understand and apply the basic theory and operation of transistor amplifiers 17. Define and explain the frequency response of bipolar transistor amplifier 18. Understand the basic concept of negative feedback 19. Understand and analyze the feedback amplifier 20. Understanding the operation of ideal operational amplifier 21. Dealing with dc and ac op-amp equivalent circuit 22. Understanding the basic application of op-amp 23. Power electronic devices principle overview

Indicative Contents	**Transistor and FET amplifier analysis:** Small signal model analysis, low frequency and high frequency analysis, hybrid model, hybrid -Pi model analysis. **Amplifier with negative feedback:** Basic concept, feedback analysis, feedback configurations, Feedback effects on gain , bandwidth, input and output resistances **Operational amplifier:** Ideal Op-amp equivalent circuit; Operational Amplifier Specification; Circuit analysis of an Op-amp; Closed loop Op-amp Circuit (Inverting and Non-Inverting Circuit). **Op-amp Applications:** Summation & subtraction Circuit, Differential circuit Buffer circu Ideal and practical Integrator circuits, ideal and practical Differentiator circuits, Examples. **Power electronic devices:** UJT Construction, Operation and characterises; Thyrsistor Equivalent Circuit ; Thyrsistor Characteristics and operation ; Application of the devices.

Learning and Teaching Strategies	
Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)

Structured SWL (h/sem)	74	**Structured SWL (h/w)**	3
Unstructured SWL (h/sem)	101	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	175		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	6	10% (10)	٢, ٥, ٩,12,13,15	LO #1, 2, 10 and 11
	Assignments	6	10% (10)	٢, ٥, ٩,12,13,15	LO # 3, 4, 6 and 7
	Projects / Lab.	6	20% (20)	٢, ٥, ٩,12,13,15	LO # 3, 4, 6 and 7, 5, 8 and 10
	Report	0	0% (0)	0	
Summative assessment	**Midterm Exam**	1:30hr	20% (20)	10	LO # 1-4
	Final Exam	3hr	40% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Small signal model analysis
Week 2	Low and high frequency response of transistor amplifier
Week 3	Hybrid and hybrid-Pie equivalent circuit analysis
Week 4	Negative feedback concept and analysis
Week 5	Advantages of negative feedback on amplifier
Week 6	Amplifier feedback topologies Feedback effect on amplifier gain, bandwidth, and on input-output resistances operational amplifier construction and operation ideal and practical op-amp equivalent circuit
Week 7	
Week 8	
Week 9	
Week 10	Inverting and non inverting closed loop amplifier Integration and differentiation active circuits
Week 11	

Week 12	Summation and subtraction op-amp circuits
Week 13	UJT transistor construction
Week 14	Thyristor equivalent circuit and characteristics
Week 15	Subject review
Week 16	**Subject review**

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1-15	**Practical experiments in transistor amplifier frequency response at lo and high frequency** **To measure the effect of feedback on amplifier performance** **To measure the performance of different op-amp circuits.**

Learning and Teaching Resources

	Text	**Available in the Library?**
Required Texts	Electronic Devices By Millmann Electronic Devices By Floyd	yes
Recommended Texts	**SOLID STATE DIVICES", PHI; 4TH EDITION**, 1995.By STREETMAN, **SEMICONDUCTOR DEVICES & CIRCUITS", JOHN WILEY & SONS, 1992**.By : M.S. TYAGI	Yes
Websites	Electronic circuits	

Grading Scheme

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

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

معلومات المادة الدراسية

Module Title	Digital Design	**Module Delivery**	
Module Type	**Core**		☒ **Theory**
Module Code	**NVEE223**		☒ **Lecture**
ECTS Credits	4		☐ **Lab**
SWL (hr/sem)	100		☒ **Tutorial**
			☐ **Practical**
			☐ **Seminar**

Module Level	2	**Semester of Delivery**	1
Administering Department	Electronic Eng. Dep.	**College**	Electronics Engineering
Module Leader	Amer Talal Ali	**e-mail**	
Module Leader's Acad. Title	Lecturer assistant	**Module Leader's Qualification**	
Module Tutor	Amer Talal Ali	**e-mail**	
Peer Reviewer Name	Name	**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	19. To understand Advanced Minimization techniques for large number of bits to simplify the large designs. 20. Understand how to Design an Arithmetic and Logic unit. 21. Understand how to Design using programmable logic device. 22. To understand the sequential Logic Circuits. 23. To understand how to Design synchronous and asynchronous counters. 24. To understand the Design of Registers.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Using Advanced Minimization techniques for large number of bits to simplify the large designs. 2. Design an Arithmetic and Logic unit. 3. Design using programmable logic device. 4. Design sequential Logic Circuits synchronous and asynchronous. 5. Design Registers. 6. Design synchronous and asynchronous counters.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – minimization techniques for large number of bits [14 hrs] Part B – Initialization to design and Design an Arithmetic and Logic unit. [14 hrs] Part C – Design using programmable logic device. [6 hrs] Part D – sequential Logic Circuits. [18 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 and digital designing skills. This will be achieved through classes and interactive tutorials.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	60	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**120**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	[3,6,9,12]	LO (#1- #12)
	Assignments	1	10% (10)	14	LO #4, #7, #(10-13)
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	12	LO #11
Summative assessment	**Midterm Exam**	1.5 hr	10% (10)	10	LO #(1-8)
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Digital Design
Week 2	The 5-Variable Karnaugh Map; The 5-Variable Karnaugh Map with don't care conditions
Week 3	Map Entered variable Karnaugh Map
Week 4	ADDITIONAL MINIMAZATION TECNHNIQUES: Tabular method; Quine-McCluskey
Week 5	Design using multiplexer: - Shannon Expansion
Week 6	top-down desigin of combainaonal CIRCUITS: - Gate Level: Adders; Subtractor
Week 7	Design an Arithmetic and Logic unit
Week 8	memory and type of memories
Week 9	Design using programmable logic device (PLD): - PROM; PAL; PLA;
Week 10	sequential LOGIC: - Type of flip-flops; Timing Diagram; Basic concepts of counters; Binary counters; BCD counters; Up down counter
Week 11	sequential LOGIC: -Design of counters using state diagrams and tables;
Week 12	sequential LOGIC: -Mealy and Moore Circuits;
Week 13	synchrous CIRCUITS: Shift left and right register; Registers with parallel load; Serial –in arallel-out (SIPO) and parallel-in-serial-out (PISO).
Week 14	synchrous CIRCUITS: Shift Registers; Twisted Ring Counter; Maximum Length Shift Counter.
Week 15	Preparatory week before the final Exam

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

Required Texts	"Digital and analog communication" 2001 By L. W. Couch Sixth Edition	Yes
Recommended Texts	- Digital Communications Fifth Edition, 2008, John G. Proakis, and Masoud Salehi. Introduction to Communication Systems" 1992 By F. Stremler. -ELEMENTS OF INFORMATION THEORY" 2006 By THOMAS M. COVER and JOY A. THOMAS -Digital Communication, 2004 by Abbas Kattoush.	Yes
Websites		

Grading Scheme

مخطط الدرجات

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

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

Module Information

Module Title	Electromagnetic Fields I	**Module Delivery**	
Module Type	Core		☐ **Theory**
Module Code	NVEE215		☒ **Lecture**
ECTS Credits	4		☐ **Lab**
SWL (hr/sem)	100		☒ **Tutorial** ☐ **Practical** ☐ **Seminar**

Module Level	2	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	SINAN KHALID SHANSHAL	**e-mail**	**sinan.mohammed@uoninevah.edu.iq**
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	02/07/2023	**Version Number**	1.0

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	To develop knowledge of the laws governing the behavior of electric fields, and to relate the laws governing the fields to applications in a range of electrical and electronic engineering application.
Module Learning Outcomes	On completion of the course the students should be able: • to have detailed knowledge of the physical background and terminology of the electrostatic field theory for electrical engineering problems • to understand the electrostatic field behavior • to select and use appropriate theoretical models for analysis, problem solving and finding solutions related to the electrostatic fields • to understand how laws of electrostatic can be applied to problems arising in engineering.
Indicative Contents	Electric charge and the electric field Electric flux density and Gauss's Law Electric potential Electric field in matter and boundary conditions Capacitance

Learning and Teaching Strategies	
Strategies	Through the presentation of a theoretical explanation with the aid of white board and 'Data Show', to illustrate syllabus (examples and exercises) and using text books.

Student Workload (SWL)			
Structured SWL (h/sem)	45	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	?	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	?		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	15% (10)	5,8,10,12	LO #1-5, 9 and 11
	Assignments	4	15% (10)	6,9,11,13	LO # 1-5, 6, 10 and 12
	Projects	0	0% (0)		
	Report	0	0% (0)		
Summative assessment	**Midterm Exam**	1.5hr	20% (20)	10	LO # 1-8
	Final Exam	3hr	50% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Review of Vector Calculus
Week 2	Review of Vector Calculus
Week 3	Experimental law of coulomb; Electric field intensity;
Week 4	Field of a continuous and volume charge distributions; line charge and sheet charge;
Week 5	Field of a continuous and volume charge distributions; line charge and sheet charge;
Week 6	Electric flux density; Gauss's law;
Week 7	Application of Gauss's law; some symmetrical charge distributions.
Week 8	Energy expended in moving a point charge in an electric field;
Week 9	Definition of potential difference and potential;
Week 10	Potential field of a point charge and system of charges; Potential gradient.
Week 11	Conductor Properties and boundary conditions;
Week 12	Nature of Dielectric Materials; Boundary Conditions for Perfect dielectric Materials;
Week 13	Capacitance; Several Capacitance Examples.
Week 14	Poisson and Laplace 's equations; Examples of the solution of Laplace equation
Week 15	Examples of the solution of Laplace equation; Examples of the solution of Poisson's equation.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1-15	

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1-ENGINEERING ELECTROSTATICES, Mc- Graw Hill, By WILLAIM H. HAYT. 2-Elements of engineering electrostatic, Prentice Hall, By Matthew N. O. SADIKU	No
Recommended Texts	1-Electrostatics (Schaum's Outlines), McGraw-Hill Education By Edminister, Joseph_ Nahvi, Mahmood.	No
Websites		

Grading Scheme

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

Module Title	Human Physiology	**Module Delivery**	
Module Type	Support	☐ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVEEELM 213		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	**Semester of Delivery**	1
Administering Department	Electronics dept	**College**	Electronics engineering college
Module Leader		**e-mail**	
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	This subject introduces engineering students to human anatomy and physiology, with direct application of the knowledge to considerations for designing and manufacturing medical devices and equipment to assist in overcoming physical disabilities.
Module Learning Outcomes	Upon completion this unit, the student should be able to: 1. Demonstrate correct usage of the terminology used to describe anatomical structures. 2. Describe the organization of cells and tissues. 3. Describe the principles relating to the structure of connective tissues, skeletal muscle, bones and joints. 4. Describe the principles of excitable tissues. 5. Describe the structure and function of the human eye and ear and the mechanisms of vision and hearing. 6. Describe the principles of sensorimotor control. 7. Describe cardiac mechanics and cardiac biophysics. 8. Describe the application of technologies and techniques for investigating the structure and function of the body.
Indicative Contents	Anatomical terminology. The structure and appearance of cells and tissues. The appearance of bone and cartilage, the organization of dense connective tissues. Skeletal muscle structure and function. Principles of excitable tissues. The structure and function of sensory systems, including the eye and vision and the ear and hearing. Principles of sensory motor control. Cardiac mechanics and cardiac biophysics. Technologies, quantitative measurements and experimental techniques used to investigate the structure and function of different tissues, organs and organ systems.

Learning and Teaching Strategies

Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)

Structured SWL (h/sem)		**Structured SWL (h/w)**	
Unstructured SWL (h/sem)		**Unstructured SWL (h/w)**	
Total SWL (h/sem)			

Module Evaluation

		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**				
	Assignments				
	Projects / Lab.				
	Report				
Summative assessment	**Midterm Exam**				
	Final Exam				
Total assessment					

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Cells and their function
Week 2	Tissues, glands & membranes
Week 3	Muscle tissue
Week 4	The skeleton
Week 5	Nervous system

Week 6	Sensory
Week 7	Respiration
Week 8	The eye
Week 9	The joints
Week 10	The skin
Week 11	Digestive system
Week 12	The urinary system and body fluids
Week 13	The heart
Week 14	Blood
Week 15	Blood vessels Blood clotting
Week 16	Preparatory week before the final exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts		
Recommended Texts		
Websites		

Grading Scheme

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

Courses specification for Second class Medical Engineering (Second Course)

Module Information					
Module Title	Signals and Systems			**Module Delivery**	
Module Type	Core			☐ **Theory**	
Module Code	NEEM210			☒ **Lecture**	
ECTS Credits	6			☐ **Lab**	
SWL (hr/sem)	150			☐ **Tutorial**	
				☐**X Practical**	
				☐ **Seminar**	
Module Level	1		**Semester of Delivery**	4	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Assistant 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	25/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	Student will be able to: 25. identify systems concepts . 26. understand the properties of systems . 27. understand the mathematical relation between input and output of a system. 28. deal with Fourier and Laplace analysis of systems. 29. perform z-transform of discrete signals .
Module Learning Outcomes	53. Definition of the system concept. 54. Introduction of mathematical models. 55. Explain Continuous time systems. Discrete time systems. 56. Introduction of frequency response of systems. 57. Definition of filters. 58. Explain Ideal filters, Non ideal filters, and Butterworth filter design. 59. Define Z-transform of discrete signals. 60. Analyze of continuous system using Laplace Transform. System transfer function. 61. Definition of transfer function of a discrete system.
Indicative Contents	Indicative content includes the following. Introduction to systems: - Definition and mathematical models. - Properties of systems. Transformation used with continuous systems - Fourier transforms. - Filters. - Laplace transform. Z-transform: - Introduction of z- transform of discrete time signal. - Z-transform used with discrete systems.

	Convolution used for - Continuous systems. - Discrete systems

Learning and Teaching Strategies	
Strategies	To make students interesting with both types of systems: continuous and discrete. Also with properties of systems and operations . To make them familiar with time and frequency domain and analysis of a system. Also to make them familiar with different types of transforms of systems. Also to make them have an experience with solving different problems and examples.

Student Workload (SWL)			
Structured SWL (h/sem)ل	62	**Structured SWL (h/w)** ا	4
Unstructured SWL (h/sem)	88	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	**150**		

Module Evaluation				
	Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**

Formative assessment	**Quizzes**	6	10% (10)	٢, ٥, ٩,12,13,15	LO #1, 2, 10 and 11
	Assignments	6	10% (10)	٢, ٥, ٩,12,13,15	LO # 3, 4, 6 and 7
	Projects / Lab.	6	20% (20)	٢, ٥, ٩,12,13,15	LO # 3, 4, 6 and 7, 5, 8 and 10
	Report	0	0% (0)	0	
Summative assessment	**Midterm Exam**	1.5hr	20% (20)	10	LO # 1-4
	Final Exam	3hr	40% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Basic definitions. Mathematical models.
Week 2	Continuous time systems.
Week 3	Discrete time systems.
Week 4	System properties.
Weeks 5	Mathematical system representation in time domain: Convolution representation.
Week 6	Convolution properties.
Week 7	System description by linear constant coefficient differential equations.
Week 8	Frequency domain analysis of continuous system.
Week 9	Frequency response of a system.
Week 10	Frequency response of electrical circuits.
Week 11	Ffilters. Distortion less transmission.
Week 12	Ideal filters. Non ideal filters. Butterworth filter design.

Week 13	Analysis of continuous system using Laplace Transform.
Week 14	System transfer function.
Week 15	Analysis of discrete system using z-Transform. System transfer function.

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	**Signals and Systems. Simon S. Haykin**	Yes
Recommended Texts	**Signals and linear Systems. G. E. Carlson**	

Grading Scheme

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 Information

Module Title	Engineering Analysis II		**Module Delivery**	
Module Type	Core		☐ **Theory**	
Module Code	NVEE209		☒ **Lecture**	
ECTS Credits	3		☐ **Lab**	
SWL (hr/sem)	75		☒ **Tutorial**	
			☐ **Practical**	
			☐ **Seminar**	
Module Level	2	**Semester of Delivery**	2	
Administering Department	Electronics dept	**College**	Electronics engineering college	
Module Leader	Dr. Omar B Mohammed	**e-mail**	omar.mohammed@uoninevah.edu.iq	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name		**e-mail**		
Scientific Committee Approval Date		**Version Number**		

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	This course covers the following topics: ordinary differential equations, sequences and series, solution of differential equations by power series, and matrix analysis. Those areas of mathematics which are most important in connection with practical problems for modeling different areas of science, computer can be easily utilized to find the properties of such systems.
Module Learning Outcomes	Upon successful completion, students will: 7. Improve their problem-solving skills. 8. Apply that knowledge toward practical problems in different areas of science. 9. Utilize the computer capabilities to solve such problems using proper methods. 10. Learn how to represent any function as a power series, then use computer to solve it. 11. Learn the importance of differential equations for modeling almost any system, and how to solve it to find the properties of that system. 12. Learn the linear algebra and its importance in science.
Indicative Contents	Ordinary Differential Equations. Sequences and Series. Solution of Differential Equations by Power Series. Matrix Analysis.

Learning and Teaching Strategies	
Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)			
Structured SWL (h/sem)		**Structured SWL (h/w)**	
Unstructured SWL (h/sem)		**Unstructured SWL (h/w)**	

Total SWL (h/sem)			

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**				
	Assignments				
	Projects / Lab.				
	Report				
Summative assessment	**Midterm Exam**				
	Final Exam				
Total assessment					

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Ordinary Differential Equations: 1. First order (variables separable, homogeneous, linear and exact). 2. Second order homogeneous. 3. Second order nonhomogeneous; indeterminant coefficients, variation of parameters.
Week 2	
Week 3	
Week 4	
Week 5	Infinite Sequences and Series: 1. Limit laws, indeterminate forms and L'hospital rule. 2. Infinite series; convergence test. 3. Power series; Taylor and Maclaurin series.
Week 6	
Week 7	
Week 8	
Week 9	Solution of Differential Equations by Power Series: Power series method, Legendre's equation; Legendre s polynomials.
Week 10	
Week 11	
Week 12	
Week 13	Matrix Analysis: 1. Review of matrix theory, solving system of equations; Cramer's rule, inverse of the matrix method, Gauss elimination. 2. Eigen values and eigen vectors. 3. Diagonalization of matrices
Week 14	
Week 15	

	4. Application of matrices to electric circuits.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Advanced Engineering Mathematics By KREYSIK	Yes
Recommended Texts	Calculus By Finney& Thomas	Yes
Websites		

Grading Scheme

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

Module Title	**Electronic II**	**Module Delivery**	
Module Type	**Core**	☐ **Theory**	
Module Code	**NVEEELM221**	☒ **Lecture**	
ECTS Credits	**6**	☐ **Lab**	
SWL (hr/sem)	**150**	☒ **Tutorial**	
		☒ **Practical**	
		☐ **Seminar**	

Module Level	1	**Semester of Delivery**	2
Administering Department	Electronics	**College**	Electronic Engineering college
Module Leader		**e-mail**	
Module Leader's Acad. Title	Assistant Prof.	**Module Leader's Qualification**	PhD
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	Ahmad.younis@uoninevah,edu,iq
Scientific Committee Approval Date	12/06/2023	**Version Number**	1.0

Relation with other Modules

Prerequisite module	Electronic I	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	24. To understand the basic theory and operation of bipolar transistor 25. To be familiar with current mechanism in an npn and pnp transistors 26. To concentrate transistor physical and electrical characteristics 27. To illustrate and design different dc biasing circuits 28. To understand the biasing stability conditions 29. To be able to deal with the mathematical behavior of transistor model 30. To understand small signal analysis of transistor amplifier 31. To deal with different transistor amplifier configuration 32. To be able to deal with the frequency response of transistor amplifier 33. To understand the basic operation of field effect transistor and MOS device 34. To understand the dc and ac behavior of FET and MOS amplifiers
Module Learning Outcomes	24. Understand and apply the basic theory and operation of transistor amplifiers 25. Define and explain the electrical characteristic of bipolar transistor 26. Understand the basic structure of npn and pnp transistors 27. Understand and analyze the electrical transistor model 28. Understanding the dc and ac analysis of transistor amplifier 29. Dealing with dc biasing and ac amplifiers 30. Understanding the effect of frequency on amplifier response 31. Familiar with other FET and MOS circuits

Indicative Contents	**Bipolar junction transistors,** Transistor construction, transistor operation, NPN & PNP Bipolar Transistor; Current Flow Mechanism in Transistor Junctions; Transistor configurations; Current Gain Calculation [Alpha] and [Beta]; Transistor input/ output characteri DC Load line ; Operating point; Different DC circuit biasing. Bias circuit, voltage divider circu bias with feedback **DC biasing,** Operating point, fixed bias circuit, emitter bias circuit, voltage divider circuit, dc bias with feed **Biasing stability** Stability factor analysis due to temperature variation (Effect of Ico, Vbe and Beta); Temperat compensation using diode biasing. **Small signal analysis,** Small signal equivalent circuit for CB, CE and CC configuration; Input/Output resistance; Calculation of current and voltage Gain in small signal amplifier; Graphical Analysis for vol gain; Hybrid parameters to analyze transistor circuits. **Field Effect Transistor (FET) and MOS transistor :** **FET biasing configurations, Depletion and Enhanced mode operation,** Introduction to the theory and operations of JFFT & MOSFET; FET Transistor configura Transistors transfer characteristics; Amplifier Circuit Biasing; transistor Equivalent circuit; signal analysis of FET transistor. **FREQUENCY RESPONSE:** Definition and Concepts; Gain in decibel; Bode plot for the gain; The effect of the Coupling capacitor; Low frequency analysis due to the R-C Coupled amplifier in BJTs; the Effect of emit bypass capacitor**;** Calculation of the Low cut-off frequency. Transistor amplifier at high frequer Hybrid PIE equivalent circuit at high frequency; High frequency behavior of CB & CE amplifi High cut-off frequency; Gain Band-Width products for the above circuits; FET at high frequenc CD and CS amplifier at high frequency; .

Learning and Teaching Strategies	
Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)

Structured SWL (h/sem)	88	**Structured SWL (h/w)**	3
Unstructured SWL (h/sem)	76	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	164		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	6	10% (10)	٢, ٥, ٩,12,13,15	LO #1, 2, 10 and 11
	Assignments	6	10% (10)	٢, ٥, ٩,12,13,15	LO # 3, 4, 6 and 7
	Projects / Lab.	6	20% (20)	٢, ٥, ٩,12,13,15	LO # 3, 4, 6 and 7, 5, 8 and 10
	Report	0	0% (0)	0	
Summative assessment	**Midterm Exam**	1:30hr	20% (20)	10	LO # 1-4
	Final Exam	3hr	40% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Transistor construction and operation
Week 2	Bipolar transistor current flow mechanism
Week 3	Transistor configurations, current gain calculation, and input and output resistances
Week 4	Dc biasing circuits, operating point calculation
Week 5	Biasing stability, stability factor calculation
Week 6	Temperature compensation using diode biasing
Week 7	Small signal equivalent circuit for CB, CC, CE configurations
Week 8	Calculation of voltage and current gains
Week 9	Hybrid model ac analysis of transistor amplifier
Week 10	FET and MOS transistors operation

Week 11	FET biasing configurations
Week 12	Depletion and enhancement mode operation
Week 13	Definition and analysis of amplifier frequency response
Week 14	Low frequency and high frequency analysis
Week 15	Hybrid-Pie equivalent circuit at high frequency
Week 16	**Subject review**

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1-15	**Practical experiments in transistor amplifiers to measure the current and voltage gains.** **To measure the input and output amplifier resistances** **To measure the amplifier frequency response.**

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	**Textbook1:INTEGRATEDELECTRONICS"MCGRAWHILL;9THREPRINT,1995**.ByMILLMAN&HALKIES **2: " ELECTRONICS DEVICES AND COMPONENTS", PITMAN,** 1995 By MOTTERSHED,. ,	yes
Recommended Texts	**3: " SOLID STATE DIVICES", PHI; 4TH EDITION**, 1995.By STREETMAN, **4" SEMICONDUCTOR DEVICES & CIRCUITS", JOHN WILEY & SONS, 1992**.By : M.S. TYAGI	Yes
Websites	Electronic circuits	

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

Module Title	Programming	**Module Delivery**	
Module Type	Core	☒ **Theory**	
Module Code	NVEEELM222	☒ **Lecture**	
ECTS Credits	6	☒ **Lab**	
SWL (hr/sem)	150	☐ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	

Module Level	UGx11 2	**Semester of Delivery**	2
Administering Department	Dept. of Electronic Eng. (Med. Ele)	**College**	College of Electronic Engineering
Module Leader	Qais Thanon	**e-mail**	Qais.najim@uoninevah.edu.iq
Module Leader's Acad. Title	Porf.	**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	20/06/2023	**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 Objectives أهداف المادة الدراسية	1. Learning about the algorithms types and how building the algorithms. 2. Learning how to command computers to perform tasks using C++ language (Programming/coding). 3. Become acquainted with the designed programming including sequencing, condition and iteration. 4. Learn about the 1d and 2d arrays in C++ language. 5. Learn about the functions in C++ language.

	6. Learn about the strings in C++ language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the meaning of the algorithms in programming languages. 2. Understanding the basics concepts of C language programming such as variables, data types, operators, control 3. Understanding the utilities of each one of sequencing, condition, and loops, and basic input/output operations. 4. Understanding how represent the data in 1d arrays and 2d arrays. 5. Learn about how the strings represented in C language. 6. Learn about divide any problem in sub-program and execute this problem by using function. 7. In advance practical experience by working on programming exercises and projects.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Visualization via flowchart and Pseudocode [4 hrs] • Keyworks, identifier, format specifier, and naming variables and constants [8 hrs] • Use standard libraries to take input and display output [8 hrs] • Operators in C++ programming [10 hrs] • Priorities in C++ programming [4 hrs] • Math functions [4 hrs] • Conditional operations [8 hrs] • Iterations (Loop operators) [10 hrs] • Arrays [10 hrs] • Functions [8 hours] • Review classes and problem solving [8 hrs]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy being focused on is developing conceptual programming thinking, meanwhile refining and expanding their mathematical thinking skills. This will be achieved through classes, online lectures, interactive tutorials. Additionally, working on complex projects that challenge students' skills and require to apply advanced concepts. Such projects would help students exploring various aspects of C++ programming and gain hands-on experience in solving complex problems. 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	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation
تقييم المادة الدراسية

As	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to computer languages and the structure of C program
Week 2	Flowchart and Pseudo-code
Week 3	Introduction to C++ programming: Declare variables and constants
Week 4	Take input and print output
Week 5	Assignment and Increment ,Decrement, Arithmetic, Logical, and Bitwise operators
Week 6	Standard math functions in math header <math.h>
Week 7	Priorities of operators in C++ programming
Week 8	Relational and conditional operators
Week 9	Mid-term Exam
Week 10	If statement versus switch case statement
Week 11	Examples of structured programming (sequencing and condition)
Week 12	Loop operators (For, while, do-while)
Week 13	Arrays
Week 14	Functions
Week 15	String of characters
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1-2	Learn the C++ language program complier.
Week 3-4	Declare variables and constants and <iostream.h> including standard functions
Week 5-6	Arithmetic, logical, and bitwise operators
Week 7-8	Math header for math functions <math.h> and Assignment and increment & decrement operators
Week 9-10	Relational and conditional operators and Loop operators
Week 11-12	Examples about the Arrays
Week 13-14	Examples about Functions and string

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	C Programming Absolute Beginner's Guide, 3rd Edition 2014. BY: Greg Perry and Dean Miller.	Yes
Recommended Texts	C How to Program with an introduction to C++, 8th Edition 2016. *BY: Paul Deitel and Harvey Deitel.* Global Edition contribution by Piyali Sengupta	No
Websites	1- https://www.programiz.com/c-programming 2- https://www.coursera.org/specializations/c-programming	

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 Information

Module Title	Electromagnetic Fields II	**Module Delivery**	
Module Type	**Core**		☐ **Theory**
Module Code	NVEE221		☒ **Lecture**
ECTS Credits	**6**		☐ **Lab**
SWL (hr/sem)	**150**		☒ **Tutorial**
			☐ **Practical**
			☐ **Seminar**

Module Level	2	**Semester of Delivery**	2
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	SINAN KHALID SHANSHAL	**e-mail**	**sinan.mohammed@uoninevah.edu.iq**
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	02/07/2023	**Version Number**	1.0

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	To develop knowledge of the laws governing the behavior of magnetic and electro-magnetic fields, and to relate the laws governing the fields to applications in a range of electrical and electronic engineering application.
Module Learning Outcomes	On completion of the course the students should be able: • to have detailed knowledge of the physical background and terminology of the electromagnetic field theory for electrical engineering problems • to understand the electromagnetic field behavior • to select and use appropriate theoretical models for analysis, problem solving and finding solutions related to the electrostatic, magnetostatic and electromagnetic fields • to understand how laws of electromagnetism can be applied to problems arising in engineering.
Indicative Contents	Magnetic field and Ampere's Law Magnetic flux and Gauss's Law for magnetic fields Faraday's Law Inductance Maxwell's equations Applications of Electromagnetics

Learning and Teaching Strategies	
Strategies	Through the presentation of a theoretical explanation with the aid of white board and 'Data Show', to illustrate syllabus (examples and exercises) and using text books.

Student Workload (SWL)			
Structured SWL (h/sem)	45	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	?	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	?		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	4	15% (10)	5,8,10,12	LO #1-5,6-7, 9 and 11
	Assignments	4	15% (10)	6,9,11,13	LO # 1-5, 6, 10 and 12
	Projects	0	0% (0)		
	Report	0	0% (0)		
Summative assessment	**Midterm Exam**	1.5hr	20% (20)	10	LO # 1-8
	Final Exam	3hr	50% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Review of Vector Calculus
Week 2	Review of Vector Calculus
Week 3	Boit – Savart law
Week 4	Amperes law; Magnetic Flux & Magnetic Flux Density
Week 5	Inductance
Week 6	Force on Moving Charge; Force on Differential Current. Elements
Week 7	Force and Torque on a Closed Circuit
Week 8	Magnetization and Permeability; Magnetic Boundary Conditions; Magnetic Circuit.
Week 9	Faraday's Law;
Week 10	Maxwell's Equations
Week 11	Example of Maxwell's Equations
Week 12	Wave Equations; Wave Propagation in Lossy Dielectrics
Week 13	Plane Waves in Lossless Dielectrics; Plane Waves in Free Space
Week 14	Plane Waves in Good Conductors;
Week 15	Power and the Poynting Vector.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1-15	

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	1-ENGINEERING ELECTROMAGNETICES, Mc- Graw Hill, By WILLAIM H. HAYT. 2-Elements of engineering electromagnetic, Prentice Hall, By Matthew N. O. SADIKU	No
Recommended Texts	1-Electromagnetics (Schaum's Outlines), McGraw-Hill Education, By Edminister, Joseph_ Nahvi, Mahmood.	No
Websites		

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

Module Title	English	**Module Delivery**	
Module Type	Support	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	NVU11		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGx11 1	**Semester of Delivery**	1
Administering Department		**College**	NV
Module Leader		**e-mail**	
Module Leader's Acad. Title	Noor Mothafar Hamid	**Module Leader's Qualification**	MS.D.
Module Tutor	Name (if available)	**e-mail**	noorm.hame@duoninevah.edu.iq
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	35. To develop skills, reading, writing and understanding of English language through the application of teaching techniques. 36. To understand scientific subjects and technical terms through reading and comprehension. 37. This course deals with the basic concepts of scientific subjects. 38. This course handles how to write simple research and how to make a successful presentation. 39. To understand the scientific language in English.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	32. Recognize parts of speech and tenses in English language. 33. List the various terms associated with scientific texts. 34. Summarize what is meant by a basic electric circuit. 35. Discuss Electric currents, series and parallel circuits. 36. Describe electrical power, charge, and current. 37. Discuss computers, communication and the future of computers.. 38. Identify the basic circuit elements and their applications. 39. Explain energy types and forms. 40. Discuss the various properties of radio waves and vacuum tubes. 41. Explain modulation. 42. Discuss Electromagnetism.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1.parts of speech _verb _ noun _ pronoun 2.Tenses _Past _Present _future 3.Electric currents and circuit _AC/DC _parallel, serious _Grounding, fuse, short circuit 4.Radio waves and vacuum tubes 5. Electromagnetism. 6. The future of computers, communication applications. _fiber optics. 7. Induction. _Electric generator _Electric transformer _self-induction _servomechanism 8. Incandescent lamp. 9. Energy. _types of energy _forms of energy 10. Introduction to electron and electricity. 11.Electricity and electronics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	70	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Parts of speech
Week 2	Tenses
Week 3	Electric currents and circuit

Week 4	Radio waves and vacuum tubes
Week 5	The future of computers, communication applications.
Week 6	Induction -Electric generator -Electric transformer
Week 7	Mid-term Exam
Week 8	Induction -Self-induction -Servomechanism
Week 9	Incandescent lamp.
Week 10	Energy. -types of energy -forms of energy
Week 11	Introduction to electron and electricity.
Week 12	Electricity and electronics
Week 13	The cathode ray tube
Week 14	Propagation
Week 15	Modulation
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	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	English in electrical engineering and electronics. The language of electrical and electronic engineering in English.	Yes

Recommended Texts	English for electrical engineering and computing.	No
Websites	https://www.askoxford.com/betterwriting/succesfulcv/application/?view=uk	

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.

Courses specification for Second class Industrial Electronic Engineering (Second Course)

Module Information					
Module Title	**DC Machines**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NEEI2313**				
ECTS Credits	**6**				
SWL (hr/sem)	**114**				
Module Level	2 2		**Semester of Delivery**	1	
Administering Department	Electronic Dept.		**College**	Electronics collage	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**		

Relation with other Modules			
Prerequisite module	DC Circuit Analysis	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	40. Understanding DC Machine Principles 41. Analyzing DC Machine Behavior 42. Control Strategies 43. System Integration 44. Practical Applications 45. Problem-Solving Skills 46. Laboratory Skills 47. Teamwork and Communication 48. Professional Development
Module Learning Outcomes	43. Understand how voltage is induced in a rotating loop 44. Understand how curved pole faces contribute to a constant flux, and thus 45. more constant output voltages. 46. Understand how curved pole faces contribute to a constant flux, and thus more constant output voltages. 47. Understand the power flow diagram for de machines 48. Know the types of de motors in general use. 49. Understand the equivalent circuit of a de motor. 50. Understand how to derive the torque-speed characteristics of separately excited, shunt, series, and compounded de motors. 51. Understand how to control the speed of different types of de motors. 52. Understand the special characteristics of series de motors, and the applications. 53. Understand the methods of starting dc motors safely. 54. Understand the equivalent circuit of a dc generator. 55. Understand the purpose of a transformer in a power system. 56. Understand how real transformers approximate the operation of an ideal transformer. 57. Be able to explain how copper losses, leakage flux, hysteresis, and eddy currents are modeled in transformer equivalent circuits.
Indicative Contents	Introduction - A Simple Rotating Loop between Curved Pole Faces. The Voltage Induced in a Rotating Loop / Getting DC Voltage Out of the Rotating Loop / The Induced Torque in the rotating loop.(12 hrs.).
	Commutation and Armature Construction in Real DC Machine. .(8 hrs.).
	Power Flow and Losses in DC Machines. .(6 hrs.).

	Introduction to DC Motors. The Equivalent Circuit of a DC Motor. The Magnetization Curve of a DC Machine. Separately Excited and Shunt DC Motors.(10 hrs.).
	Permanent-Magnet DC Motor. The Series DC Motor. The Compounded DC Motor. .(6 hrs.).
	Motor Starters. Solid-State Speed Controllers. .(12 hrs.).
	DC Motor Efficiency Calculations. .(4 hrs.).
	Mid-term Exam. .(3 hrs.).
	Introduction to DC Generators. The Separately Excited Generator. .(12 hrs.).
	The Shunt DC Generator. The Series DC Generator.(4 hrs.).
	The Cumulatively Compounded DC Generator. The Differentially Compounded DC Generator. .(4 hrs.).
	Types and Construction of Transformers. The Ideal Transformer. .(10 hrs.).
	Theory of Operation of Real Single-Phase Transformers. The Equivalent Circuit of a Transformer. .(18 hrs.).
	Transformer Voltage Regulation and Efficiency. .(12 hrs.).
	Instrument Transformers. .(4 hrs.).

Learning and Teaching Strategies

Strategies	Visual Aids Problem-Solving Exercises Real-World Applications Group Projects Simulations and Virtual Labs Multimedia Resources Real-Life Examples

Student Workload (SWL)

Structured SWL (h/sem)	74	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	40	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	114		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Quizzes	2	10% (10)	5, 10	

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

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Introduction - A Simple Rotating Loop between Curved Pole Faces. The Voltage Induced in a Rotating Loop / Getting DC Voltage Out of the Rotating Loop / The Induced Torque in the rotating loop.
Week 2	Commutation and Armature Construction in Real DC Machine.
Week 3	Power Flow and Losses in DC Machines.
Week 4	Introduction to DC Motors. The Equivalent Circuit of a DC Motor. The Magnetization Curve of a DC Machine. Separately Excited and Shunt DC Motors
Week 5	Permanent-Magnet DC Motor. The Series DC Motor. The Compounded DC Motor.
Week 6	Motor Starters. Solid-State Speed Controllers.
Week 7	DC Motor Efficiency Calculations.
Week 8	Mid-term Exam.
Week 9	Introduction to DC Generators. The Separately Excited Generator.
Week 10	The Shunt DC Generator. The Series DC Generator
Week 11	The Cumulatively Compounded DC Generator. The Differentially Compounded DC Generator.
Week 12	Types and Construction of Transformers. The Ideal Transformer.
Week 13	Theory of Operation of Real Single-Phase Transformers. The Equivalent Circuit of a Transformer.
Week 14	Transformer Voltage Regulation and Efficiency.
Week 15	Instrument Transformers.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Electrical Machinery Fundamentals" edited by Stephen J. Chapman.	NO
Recommended Texts	electrical machines and transformer by: Ancieron and Macneiil	NO
Websites	https://www.coursera.org	

Grading Scheme				
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 Information

Module Title	**Electronic I**	**Module Delivery**	
Module Type	**core**	☐ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**NVEEELI212**		
ECTS Credits	**7**		
SWL (hr/sem)	**164**		

Module Level	1	**Semester of Delivery**	1
Administering Department	Electronics	**College**	Electronic Engineering college
Module Leader		**e-mail**	
Module Leader's Acad. Title	Assistant Prof.	**Module Leader's Qualification**	PhD
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	Ahmad.younis@uoninevah,edu,iq
Scientific Committee Approval Date	12/06/2023	**Version Number**	1.0

Relation with other Modules

Prerequisite module	NEEI1223	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	49. To understand the basic theory and operation of bipolar transistor 50. To be familiar with current mechanism in an npn and pnp transistors 51. To concentrate transistor physical and electrical characteristics 52. To illustrate and design different dc biasing circuits 53. To understand the biasing stability conditions 54. To be able to deal with the mathematical behavior of transistor model 55. To understand small signal analysis of transistor amplifier 56. To deal with different transistor amplifier configuration 57. To be able to deal with the frequency response of transistor amplifier 58. To understand the basic operation of field effect transistor and MOS device 59. To understand the dc and ac behavior of FET and MOS amplifiers
Module Learning Outcomes	58. Understand and apply the basic theory and operation of transistor amplifiers 59. Define and explain the electrical characteristic of bipolar transistor 60. Understand the basic structure of npn and pnp transistors 61. Understand and analyze the electrical transistor model 62. Understanding the dc and ac analysis of transistor amplifier 63. Dealing with dc biasing and ac amplifiers 64. Understanding the effect of frequency on amplifier response 65. Familiar with other FET and MOS circuits

Indicative Contents	**Bipolar junction transi** Transistor construction, transistor oper NPN & PNP Bipolar Transistor; Current Flow Mechanism in Transistor Junctions; Transistor configurat Current Gain Calculation [Alpha] and [Beta]; Transistor input/ output characteristics; DC Load line ; Ope point; Different DC circuit biasing. Bias circuit, voltage divider circuit, dc bias with feedback **DC biasing,** Operating point, fixed bias circuit, emitter bias circuit, voltage divider circuit, dc bias with feedback. **Biasing st** Stability factor analysis due to temperature variation (Effect of Ico, Vbe and Beta); Temperature compe using diode biasing. **Small signal analysis,** Small signal equivalent circuit for CB, CE and CC configuration; Input/Output resistance; Calcu of current and voltage Gain in small signal amplifier; Graphical Analysis for voltage gain; Hybric parameters to analyze transistor circuits. **Field Effect Transistor (FET) and MOS tran** **FET biasing configurations, Depletion and Enhanced mode ope** Introduction to the theory and operations of JFFT & MOSFET; FET Transistor configurations; Tran transfer characteristics; Amplifier Circuit Biasing; transistor Equivalent circuit; Small signal analysis tra **FREQUENCY RESPC** Definition and Concepts; Gain in decibel; Bode plot for the gain; The effect of the Coupling capacitor; Lo frequency analysis due to the R-C Coupled amplifier in BJTs; the Effect of emitter bypass capacitor**;** Calculation of the Low cut-off frequency. Transistor amplifier at high frequencies; Hybrid PIE equivalen circuit at high frequency; High frequency behavior of CB & CE amplifier; High cut-off frequency; Gain Width products for the above circuits; FET at high frequencies; CD and CS amplifier at high frequency; .

Learning and Teaching Strategies	
Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)

Structured SWL (h/sem)	88	**Structured SWL (h/w)**	3
Unstructured SWL (h/sem)	76	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	164		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	6	10% (10)	٢, ٥, ٩١٥,13,12,	LO #1, 2, 10 and 11
	Assignments	6	10% (10)	٢, ٥, ٩١٥,13,12,	LO # 3, 4, 6 and 7
	Projects / Lab.	6	20% (20)	٢, ٥, ٩١٥,13,12,	LO # 3, 4, 6 and 7, 5, 8 and 10
	Report	0	0% (0)	0	
Summative assessment	**Midterm Exam**	1:30hr	20% (20)	10	LO # 1-4
	Final Exam	3hr	40% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Transistor construction and operation
Week 2	Bipolar transistor current flow mechanism
Week 3	Transistor configurations, current gain calculation, and input and output resistances
Week 4	Dc biasing circuits, operating point calculation
Week 5	Biasing stability, stability factor calculation
Week 6	Temperature compensation using diode biasing
Week 7	Small signal equivalent circuit for CB, CC, CE configurations
Week 8	Calculation of voltage and current gains
Week 9	Hybrid model ac analysis of transistor amplifier
Week 10	FET and MOS transistors operation
Week 11	FET biasing configurations
Week 12	Depletion and enhancement mode operation
Week 13	Definition and analysis of amplifier frequency response
Week 14	Low frequency and high frequency analysis
Week 15	Hybrid-Pie equivalent circuit at high frequency
Week 16	**Subject review**

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1-15	**Practical experiments in transistor amplifiers to measure the current and voltage gains.** **To measure the input and output amplifier resistances** **To measure the amplifier frequency response.**

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	**Textbook1:INTEGRATEDELECTRONICS"MCGRAWHILL;9THREPRINT,1995.ByMILLMAN&HALKIES** **2: " ELECTRONICS DEVICES AND COMPONENTS", PITMAN,** 1995 By MOTTERSHED,. ,	yes
Recommended Texts	**3: " SOLID STATE DIVICES", PHI; 4TH EDITION**, 1995.By STREETMAN, **4" SEMICONDUCTOR DEVICES & CIRCUITS", JOHN WILEY & SONS, 1992**.By : M.S. TYAGI	Yes
Websites	Electronic circuits	

Grading Scheme

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

Module Title	**Fundementals of Electromagnatics**		**Module Delivery**
Module Type	**Base**		☐ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	NVEEELI221		
ECTS Credits	**4**		
SWL (hr/sem)	**45**		
Module Level	2	**Semester of Delivery**	1
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	SINAN KHALID SHANSHAL	**e-mail**	**sinan.mohammed@uoninevah.edu.iq**
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	M.Sc.
Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	02/07/2023	**Version Number**	1.0

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	To develop knowledge of the laws governing the behavior of electric and electro-magnetic fields, and to relate the laws governing the fields to applications in a range of electrical and electronic engineering application.
Module Learning Outcomes	On completion of the course the students should be able: • to have detailed knowledge of the physical background and terminology of the electromagnetic field theory for electrical engineering problems • to understand the electromagnetic field behavior • to select and use appropriate theoretical models for analysis, problem solving and finding solutions related to the electrostatic, magnetostatic and electromagnetic fields • to understand how laws of electromagnetism can be applied to problems arising in engineering and biomedical sciences.
Indicative Contents	Electric charge and the electric field Electric flux density and Gauss's Law Electric scalar potential Electric field in matter and boundary conditions Capacitance Magnetic field and Ampere's Law Magnetic flux and Gauss's Law for magnetic fields Faraday's Law Inductance Maxwell's equations Applications of Electromagnetics

Learning and Teaching Strategies	
Strategies	Through the presentation of a theoretical explanation with the aid of white board and 'Data Show', to illustrate syllabus (examples and exercises) and using text books.

Student Workload (SWL)			
Structured SWL (h/sem)	45	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	؟	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	؟		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	15% (10)	5,8,10,12	LO #1-5, 9 and 11
	Assignments	4	15% (10)	6,9,11,13	LO # 1-5, 6, 10 and 12
	Projects	0	0% (0)		
	Report	0	0% (0)		
Summative assessment	Midterm Exam	1.5hr	20% (20)	10	LO # 1-8
	Final Exam	3hr	50% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Review of Vector Calculus
Week 2	Review of Vector Calculus
Week 3	Experimental law of coulomb; Electric field intensity;
Week 4	Field of a continuous and volume charge distributions; line charge and sheet charge;
Week 5	Electric flux law density; Gauss's law; Application of Gauss's law; Some symmetrical charge distributions.
Week 6	Energy expended in moving a point charge in an electric field
Week 7	Definition of potential difference and potential
Week 8	Potential field of a point charge and system of charges; Potential gradient;
Week 9	Boit – Savart law
Week 10	Amperes law
Week 11	Magnetic Flux and Magnetic Flux Density
Week 12	Force on Differential Current Elements; Force and Torque on a Closed Circuit;
Week 13	Faraday's Law; Maxwell's Equations
Week 14	Example of Maxwell's Equations
Week 15	Wave Equations.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1-15	

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1-ENGINEERING ELECTROMAGNETICES, Mc- Graw Hill, By WILLAIM H. HAYT. 2-Elements of engineering electromagnetic, Prentice Hall, By Matthew N. O. SADIKU	No
Recommended Texts	1-Electromagnetics (Schaum's Outlines), McGraw-Hill Education, By Edminister, Joseph_ Nahvi, Mahmood.	No
Websites		

Grading Scheme

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

Module Title	Engineering analysisI	**Module Delivery**	
Module Type	Base	☐ **Theory**	
Module Code	NVEE208	☒ **Lecture**	
ECTS Credits	6	☐ **Lab**	
SWL (hr/sem)	150	☒ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	

Module Level	2	**Semester of Delivery**	1
Administering Department	Electronics dept	**College**	Electronics engineering college
Module Leader	Dr. Omar B Mohammed	**e-mail**	omar.mohammed@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	

Relation with other Modules

Prerequisite module	Mathematics II	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	This course covers the following topics: Multiple Integrals, Vectors Functions, Numerical Analysis, Statistics and Probability. Those areas of mathematics which are most important in connection with practical problems for modeling different areas of science, computer can be easily utilized to find the properties of such systems.
Module Learning Outcomes	Upon successful completion, students will: 13. Improve their problem-solving skills. 14. Apply that knowledge toward practical problems in different areas of science. 15. Utilize the computer capabilities to solve such problems using proper methods. 16. Learn how to deal with geometry in 3D; find areas and volumes. 17. Solve ordinary and differential equations numerically. 18. Learn the importance of probability and statistics in everyday use.
Indicative Contents	Vectors Functions Multiple Integrals Numerical Analysis Statistics Probability

Learning and Teaching Strategies	
Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the

	consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)

Structured SWL (h/sem)		**Structured SWL (h/w)**	
Unstructured SWL (h/sem)		**Unstructured SWL (h/w)**	
Total SWL (h/sem)			

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**				
	Assignments				
	Projects / Lab.				
	Report				
Summative assessment	**Midterm Exam**				
	Final Exam				
Total assessment					

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Vectors: Vector in space, dot and cross product. Lines and planes in space. Vector valued functions and motion in space: position, velocity and acceleration, tangential vectors, curvature and normal vector.
Week 2	
Week 3	
Week 4	
Week 5	Multiple Integrals: Double Integral in rectangular coordinates, areas and volumes. Double Integral in Polar Coordinates, areas and volumes. Triple Integrals in rectangular, cylindrical, and spherical coordinates, volumes.
Week 6	
Week 7	
Week 8	
Week 9	Numerical Analysis: Solution of non-linear equations by iteration; bisection and Newton-Raphson.
Week 10	

Week 11	Numerical Integration; trapezoidal rule. Numerical solution of 1st order ordinary differential equations; Euler's method.
Week 12	
Week 13	Statistics and Probability: Definitions, mutually exclusive and conditional probability, permutations and combinations Probability distribution: binomial, normal and Poisson distributions.
Week 14	
Week 15	
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Advanced Engineering Mathematics By KREYSIK	Yes
Recommended Texts	Calculus By Finney& Thomas	Yes
Websites		

Grading Scheme

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

Module Title	Compute Programming	**Module Delivery**	
Module Type	**Core**	☒ **Theory**	
Module Code	NVEEELI214	☒ **Lecture**	
ECTS Credits	**5**	☒ **Lab**	
SWL (hr/sem)	**150**	☐ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	

Module Level	UGx11 2	**Semester of Delivery**	2
Administering Department	Dept. of Electronic Eng. (Med. Ele)	**College**	College of Electronic Engineering
Module Leader	Qais Thanon	**e-mail**	Qais.najim@uoninevah.edu.iq
Module Leader's Acad. Title	Porf.	**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	20/06/2023	**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 Objectives أهداف المادة الدراسية	1. Learning about the algorithms types and how building the algorithms. 2. Learning how to command computers to perform tasks using C++ language (Programming/coding). 3. Become acquainted with the designed programming including sequencing, condition and iteration. 4. Learn about the 1d and 2d arrays in C++ language. 5. Learn about the functions in C++ language. 6. Learn about the strings in C++ language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	8. Understanding the meaning of the algorithms in programming languages. 9. Understanding the basics concepts of C language programming such as variables, data types, operators, control 10. Understanding the utilities of each one of sequencing, condition, and loops, and basic input/output operations. 11. Understanding how represent the data in 1d arrays and 2d arrays. 12. Learn about how the strings represented in C language. 13. Learn about divide any problem in sub-program and execute this problem by using function. 14. In advance practical experience by working on programming exercises and projects.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Visualization via flowchart and Pseudocode [4 hrs] • Keyworks, identifier, format specifier, and naming variables and constants [8 hrs] • Use standard libraries to take input and display output [8 hrs] • Operators in C++ programming [10 hrs] • Priorities in C++ programming [4 hrs] • Math functions [4 hrs] • Conditional operations [8 hrs] • Iterations (Loop operators) [10 hrs] • Arrays [10 hrs] • Functions [8 hours] • Review classes and problem solving [8 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy being focused on is developing conceptual programming thinking, meanwhile refining and expanding their mathematical thinking skills. This will be achieved through classes, online lectures, interactive tutorials. Additionally, working on complex projects that challenge students' skills and require to apply advanced concepts. Such projects would help students exploring various aspects of C++ programming and gain hands-on experience in solving complex problems. 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	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction to computer languages and the structure of C program
Week 2	Flowchart and Pseudo-code
Week 3	Introduction to C++ programming: Declare variables and constants
Week 4	Take input and print output
Week 5	Assignment and Increment ,Decrement, Arithmetic, Logical, and Bitwise operators
Week 6	Standard math functions in math header <math.h>
Week 7	Priorities of operators in C++ programming
Week 8	Relational and conditional operators
Week 9	Mid-term Exam
Week 10	If statement versus switch case statement
Week 11	Examples of structured programming (sequencing and condition)
Week 12	Loop operators (For, while, do-while)
Week 13	Arrays
Week 14	Functions
Week 15	String of characters
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1-2	Learn the C++ language program complier.
Week 3-4	Declare variables and constants and <iostream.h> including standard functions
Week 5-6	Arithmetic, logical, and bitwise operators
Week 7-8	Math header for math functions <math.h> and Assignment and increment & decrement operators
Week 9-10	Relational and conditional operators and Loop operators
Week 11-12	Examples about the Arrays
Week 13-14	Examples about Functions and string

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	C Programming Absolute Beginner's Guide, 3rd Edition 2014. BY: Greg Perry and Dean Miller.	Yes
Recommended Texts	C How to Program with an introduction to C++, 8th Edition 2016. *BY: Paul Deitel and Harvey Deitel.* Global Edition contribution by Piyali Sengupta	No
Websites	1- https://www.programiz.com/c-programming 2- https://www.coursera.org/specializations/c-programming	

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.

Courses specification for Second class Industrial Engineering (Second Course)

Module Information					
Module Title	**AC Machines**			**Module Delivery**	
Module Type	**Support or related learning activity**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NVEEELI223**				
ECTS Credits	**6**				
SWL (hr/sem)	**175**				
Module Level		2	**Semester of Delivery**		2
Administering Department		Electronic Dept.	**College**	Electronics Collage	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**		

Relation with other Modules			
Prerequisite module	DC Machine	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	60. Understanding AC Machine Principles 61. Analyzing AC Machine Behavior 62. Control Strategies 63. System Integration 64. Practical Applications 65. Problem-Solving Skills 66. Laboratory Skills 67. Teamwork and Communication 68. Professional Development
Module Learning Outcomes	66. Understand how voltage is induced in a rotating loop 67. Understand how curved pole faces contribute to a constant flux, and thus 68. more constant output voltages. 69. Understand how curved pole faces contribute to a constant flux, and thus more constant output voltages. 70. Understand the power flow diagram for Ac machines

	71. Know the types of Ac machines in general use. 72. Understand the equivalent circuit of a three phase induction motor. 73. Understand how to derive the Torque speed characteristic of three phase induction motor. 74. Understand how to control the speed of different types of AC motors. 75. Understand the starting torque, condition for maximum torque, condition for maximum starting torque of the Ac motors. 76. Understand the methods of starting AC motors safely. 77. Understand the equivalent circuit of a AC generator. 78. Understand of Single phase Induction motor . Construction , theories of operation, torque speed characteristic, Equivalent circuit. 79. Understand how Test of single phase induction motor, no load test, blocked rotor test, power flow diagram, applications. 80. Understand how Three phase synchronous generator, Construction, Equivalent circuit, applications. 81. Understand how Single phase synchronous motors, Reluctance motor, Construction of reluctances motor, applications. 82. Understand how Hysteresis motor, Construction of Hysteresis motor, application. 83. Be able to explain how copper losses, leakage flux, hysteresis, and eddy currents are modeled in Ac machines circuits.
Indicative Contents	Introduction - The module further develops students' understanding of electrical machines by introducing the operational principles and characteristics of AC machines, three phase circuits and complex power. It introduces the principles, operation and design of common power electronic converter circuits.(12 hrs.)
	Commutation and Armature Construction in Real Tree phase induction motor.(8 hrs.)
	Introduction of The Equivalent Circuit of a Tree phase induction motor. (10 hrs.).
	Power Flow and Losses in Tree phase induction motor. (6 hrs.)
	Torque speed characteristic, starting torque, condition for maximum torque, condition for maximum starting torque.(12 hrs.)

	Test of three phase induction motor, no load test, blocked rotor test, power flow diagram, applications.(12 hrs.)
	Mid-term Exam. .(3 hrs.).
	Single phase Induction motor.(4 hrs.).
	Introduction of Single phase Induction motor . Construction , theories of operation, torque speed characteristic, Equivalent circuit, (12 hrs.).
	Test of single phase induction motor, no load test, blocked rotor test, power flow diagram, applications.(12 hrs.).
	Three phase synchronous generator, Construction, Equivalent circuit, applications. (12 hrs.).
	Single phase synchronous motors, Reluctance motor, Construction of eluctance motor, applications.(10 hrs.).
	Hysteresis motor, Construction of Hysteresis motor , application .(9 hrs.).
	AC Commutator machine,Universal motor.(12 hrs.).

Learning and Teaching Strategies	
Strategies	Visual Aids Problem-Solving Exercises Real-World Applications Group Projects Simulations and Virtual Labs Multimedia Resources Real-Life Examples

Student Workload (SWL)			
Structured SWL (h/sem)	74	**Structured SWL (h/w)**	5
Unstructured SWL (h/sem)	101	**Unstructured SWL (h/w)**	4.64
Total SWL (h/sem)	175		

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

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction - The module further develops students' understanding of electrical machines by introducing the operational principles and characteristics of AC machines, three phase circuits and complex power.
Week 2	Commutation and Armature Construction in AC Machine.
Week 3	Introduction of The Equivalent Circuit of a Tree phase induction motor.
Week 4	Power Flow and Losses in Tree phase induction motor.
Week 5	Torque speed characteristic, starting torque, condition for maximum torque, condition for maximum starting torque in Tree phase induction motor.
Week 6	Test of three phase induction motor, no load test, blocked rotor test. **, applications**
Week 7	Mid-term Exam.
Week 8	Introduction of Single phase Induction motor. Construction, theories of operation.
Week 9	Torque speed characteristic, Equivalent circuit, of single phase induction motor.
Week 10	power flow diagram of single phase induction motor & applications.
Week 11	Test of single phase induction motor, no load test, blocked rotor test of Single phase Induction motor.
Week 12	Three phase synchronous generator, Construction, Equivalent circuit, applications.
Week 13	Single phase synchronous motors, Reluctance motor, Construction of reluctances motor, applications.

Week 14	Hysteresis motor, Construction of Hysteresis motor , application
Week 15	AC Commutator machine, Universal motor
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Electrical Machinery Fundamentals" edited by Stephen J. Chapman.	NO
Recommended Texts	electrical machines and transformer by: Ancieron and Macneiil	NO
Websites	https://www.coursera.org	

Grading Scheme				
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 Information					
Module Title	**Electronics II**			**Module Delivery**	
Module Type	**core**			☐ **Theory**	
Module Code	**NVEEELI222**			☒ **Lecture**	
ECTS Credits	**7**			☐ **Lab**	
SWL (hr/sem)	**175**			☒ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Level	1		**Semester of Delivery**	1	
Administering Department	Electronics		**College**	Electronic Engineering college	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Assistant Prof.		**Module Leader's Qualification**	PhD	

Module Tutor		**e-mail**	
Peer Reviewer Name	Name	**e-mail**	Ahmad.younis@uoninevah,edu,iq
Scientific Committee Approval Date	12/06/2023	**Version Number**	1.0

Relation with other Modules

Prerequisite module	NEEI2212	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	69. To understand the basic analysis of bipolar transistor amplifier 70. To be familiar with the dc and ac analysis of transistor amplifier 71. To understand the dc and ac analysis of FET amplifier 72. To illustrate and to understand the frequency response of amplifier 73. To understand the basic concept of feedback concept 74. To be able to deal with different feedback amplifier topologies 75. To study the advantages of negative feedback on amplifier performance 76. To be familiar with feedback amplifier ac analysis 77. To understand the construction and ideal characteristic of operational amplifier 78. To study and analyze op-amp equivalent circuit 79. To be familiar with basic op-amp applications 80. To start with studying power electronic devices

Module Learning Outcomes	84. Understand and apply the basic theory and operation of transistor amplifiers 85. Define and explain the frequency response of bipolar transistor amplifier 86. Understand the basic concept of negative feedback 87. Understand and analyze the feedback amplifier 88. Understanding the operation of ideal operational amplifier 89. Dealing with dc and ac op-amp equivalent circuit 90. Understanding the basic application of op-amp 91. Power electronic devices principle overview
Indicative Contents	**Transistor and FET amplifier analysis:** Small signal model analysis, low frequency and high frequency analysis, hybrid model, hybrid -Pi model analysis. **Amplifier with negative feedback:** Basic concept, feedback analysis, feedback configurations, Feedback effects on gain , bandwidth, input and output resistances **Operational amplifier:** Ideal Op-amp equivalent circuit; Operational Amplifier Specification; Circuit analysis of an Op-amp; Closed loop Op-amp Circuit (Inverting and Non-Inverting Circuit). **Op-amp Applications:** Summation & subtraction Circuit, Differential circuit Buffer circu Ideal and practical Integrator circuits, ideal and practical Differentiator circuits, Examples. **Power electronic devices:** UJT Construction, Operation and characterises; Thyrsistor Equivalent Circuit ; Thyrsistor Characteristics and operation ; Application of the devices.

Learning and Teaching Strategies

Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)

Structured SWL (h/sem)	74	**Structured SWL (h/w)**	3
Unstructured SWL (h/sem)	101	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	175		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	6	10% (10)	٢, ٥, ٩,12,13,15	LO #1, 2, 10 and 11
	Assignments	6	10% (10)	٢, ٥, ٩,12,13,15	LO # 3, 4, 6 and 7
	Projects / Lab.	6	20% (20)	٢, ٥, ٩,12,13,15	LO # 3, 4, 6 and 7, 5, 8 and 10
	Report	0	0% (0)	0	
Summative assessment	**Midterm Exam**	1:30hr	20% (20)	10	LO # 1-4
	Final Exam	3hr	40% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Small signal model analysis
Week 2	Low and high frequency response of transistor amplifier
Week 3	Hybrid and hybrid-Pie equivalent circuit analysis
Week 4	Negative feedback concept and analysis
Week 5	Advantages of negative feedback on amplifier
Week 6	Amplifier feedback topologies
Week 7	Feedback effect on amplifier gain, bandwidth, and on input-output resistances
Week 8	operational amplifier construction and operation
Week 9	ideal and practical op-amp equivalent circuit
Week 10	Inverting and non inverting closed loop amplifier
Week 11	Integration and differentiation active circuits
Week 12	Summation and subtraction op-amp circuits
Week 13	UJT transistor construction
Week 14	Thyristor equivalent circuit and characteristics
Week 15	Subject review
Week 16	**Subject review**

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1-15	**Practical experiments in transistor amplifier frequency response at lo and high frequency** **To measure the effect of feedback on amplifier performance** **To measure the performance of different op-amp circuits.**

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Electronic Devices By Millmann Electronic Devices By Floyd	yes
Recommended Texts	**SOLID STATE DIVICES", PHI; 4TH EDITION**, 1995.By STREETMAN, **SEMICONDUCTOR DEVICES & CIRCUITS", JOHN WILEY & SONS, 1992**.By : M.S. TYAGI	Yes

Websites	Electronic circuits	

Grading Scheme				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance.
	B - Very Good	جيد جدا	80 - 89	Above average with some errors.
	C - Good	جيد	70 - 79	Sound work with notable errors.
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings.
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria.
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work is required, but credit is given.
	F – Fail	راسب	(0-44)	A significant amount of work is 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 Information معلومات المادة الدراسية					
Module Title	Digital Design			**Module Delivery**	
Module Type	**Base**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**NVEE223**				
ECTS Credits	3				
SWL (hr/sem)	60				
Module Level		2	**Semester of Delivery**		1
Administering Department		Electronic Eng. Dep.	**College**	Electronics Engineering	
Module Leader	Amer Talal Ali		**e-mail**		
Module Leader's Acad. Title		Lecturer assistant	**Module Leader's Qualification**		
Module Tutor	Amer Talal Ali		**e-mail**		

Peer Reviewer Name	Name	**e-mail**	
Scientific Committee Approval Date	01/06/2023	**Version Number**	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	30. To understand Advanced Minimization techniques for large number of bits to simplify the large designs. 31. Understand how to Design an Arithmetic and Logic unit. 32. Understand how to Design using programmable logic device. 33. To understand the sequential Logic Circuits. 34. To understand how to Design synchronous and asynchronous counters. 35. To understand the Design of Registers.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Using Advanced Minimization techniques for large number of bits to simplify the large designs. 2. Design an Arithmetic and Logic unit. 3. Design using programmable logic device. 4. Design sequential Logic Circuits synchronous and asynchronous. 5. Design Registers.

	6. Design synchronous and asynchronous counters.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – minimization techniques for large number of bits [14 hrs] Part B – Initialization to design and Design an Arithmetic and Logic unit. [14 hrs] Part C – Design using programmable logic device. [6 hrs] Part D – sequential Logic Circuits. [18 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 and digital designing skills. This will be achieved through classes and interactive tutorials.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	60	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem)	**120**		

الحمل الدراسي الكلي للطالب خلال الفصل	

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	[3,6,9,12]	LO (#1- #12)
	Assignments	1	10% (10)	14	LO #4, #7, #(10-13)
	Projects / Lab.	0	0% (0)		
	Report	1	10% (10)	12	LO #11
Summative assessment	Midterm Exam	1.5 hr	10% (10)	10	LO #(1-8)
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Digital Design
Week 2	The 5-Variable Karnaugh Map; The 5-Variable Karnaugh Map with don't care conditions
Week 3	Map Entered variable Karnaugh Map
Week 4	ADDITIONAL MINIMAZATION TECNHNIQUES: Tabular method; Quine-McCluskey
Week 5	Design using multiplexer: - Shannon Expansion
Week 6	top-down desigin of combainaonal CIRCUITS: - Gate Level: Adders; Subtractor

Week 7	Design an Arithmetic and Logic unit
Week 8	memory and type of memories
Week 9	Design using programmable logic device (PLD): - PROM; PAL; PLA;
Week 10	sequential LOGIC: - Type of flip-flops; Timing Diagram; Basic concepts of counters; Binary counters; BCD counters; Up down counter
Week 11	sequential LOGIC: -Design of counters using state diagrams and tables;
Week 12	sequential LOGIC: -Mealy and Moore Circuits;
Week 13	synchrous CIRCUITS: Shift left and right register; Registers with parallel load; Serial –in arallel-out (SIPO) and parallel-in-serial-out (PISO).
Week 14	synchrous CIRCUITS: Shift Registers; Twisted Ring Counter; Maximum Length Shift Counter.
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	"Digital and analog communication" 2001 By L. W. Couch Sixth Edition	Yes
Recommended Texts	- Digital Communications Fifth Edition, 2008, John G. Proakis, and Masoud Salehi. Introduction to Communication Systems" 1992 By F. Stremler. -ELEMENTS OF INFORMATION THEORY" 2006 By THOMAS M. COVER and JOY A. THOMAS -Digital Communication, 2004 by Abbas Kattoush.	Yes
Websites		

Grading Scheme

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

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

Module Information

Module Title	Signals and Systems			**Module Delivery**	
Module Type	Core			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐**X Practical** ☐ **Seminar**	
Module Code	NVEE210				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UGx11 1	**Semester of Delivery**		4
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title		Assistant 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		25/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	Student will be able to: 36. identify systems concepts . 37. understand the properties of systems . 38. understand the mathematical relation between input and output of a system. 39. deal with Fourier and Laplace analysis of systems. 40. perform z-transform of discrete signals .
Module Learning Outcomes	62. Definition of the system concept. 63. Introduction of mathematical models. 64. Explain Continuous time systems. Discrete time systems. 65. Introduction of frequency response of systems. 66. Definition of filters. 67. Explain Ideal filters, Non ideal filters, and Butterworth filter design. 68. Define Z-transform of discrete signals. 69. Analyze of continuous system using Laplace Transform. System transfer function. 70. Definition of transfer function of a discrete system.
Indicative Contents	Indicative content includes the following. Introduction to systems: - Definition and mathematical models. - Properties of systems. Transformation used with continuous systems - Fourier transforms. - Filters. - Laplace transform. Z-transform: - Introduction of z- transform of discrete time signal. - Z-transform used with discrete systems. Convolution used for - Continuous systems. - Discrete systems

Learning and Teaching Strategies

Strategies	To make students interesting with both types of systems: continuous and discrete. Also with properties of systems and operations . To make them familiar with time and frequency domain and analysis of a system. Also to make them familiar with different types of transforms of systems. Also to make them have an experience with solving different problems and examples.

Student Workload (SWL)

لStructured SWL (h/sem)	62	**Structured SWL (h/w)** ١	4
Unstructured SWL (h/sem)	88	**Unstructured SWL (h/w)**	1
Total SWL (h/sem)	**150**		

Module Evaluation

As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	6	10% (10)	٢, ٥, ,12,13,15٩	LO #1, 2, 10 and 11
	Assignments	6	10% (10)	٢, ٥, ,12,13,15٩	LO # 3, 4, 6 and 7
	Projects / Lab.	6	20% (20)	٢, ٥, ,12,13,15٩	LO # 3, 4, 6 and 7, 5, 8 and 10
	Report	0	0% (0)	0	
Summative assessment	**Midterm Exam**	1.5hr	20% (20)	10	LO # 1-4
	Final Exam	3hr	40% (40)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Basic definitions. Mathematical models.
Week 2	Continuous time systems.
Week 3	Discrete time systems.
Week 4	System properties.
Weeks 5	Mathematical system representation in time domain: Convolution representation.
Week 6	Convolution properties.
Week 7	System description by linear constant coefficient differential equations.
Week 8	Frequency domain analysis of continuous system.
Week 9	Frequency response of a system.
Week 10	Frequency response of electrical circuits.
Week 11	Ffilters. Distortion less transmission.
Week 12	Ideal filters. Non ideal filters. Butterworth filter design.
Week 13	Analysis of continuous system using Laplace Transform.
Week 14	System transfer function.
Week 15	Analysis of discrete system using z-Transform. System transfer function.

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	**Signals and Systems. Simon S. Haykin**	Yes
Recommended Texts	**Signals and linear Systems. G. E. Carlson**	

Grading Scheme

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 Information

Module Title	Engineering Analysis II	**Module Delivery**	
Module Type	Core		☐ **Theory**
Module Code	NVEE209		☒ **Lecture**
ECTS Credits	3		☐ **Lab**
SWL (hr/sem)	75		☒ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Level	2	**Semester of Delivery**	2

Administering Department	Electronics dept	**College**	Electronics engineering college
Module Leader	Dr. Omar B Mohammed	**e-mail**	omar.mohammed@uoninevah.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	

Relation with other Modules

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

Module Aims, Learning Outcomes and Indicative Contents

Module Aims	This course covers the following topics: ordinary differential equations, sequences and series, solution of differential equations by power series, and matrix analysis. Those areas of mathematics which are most important in connection with practical problems for modeling different areas of science, computer can be easily utilized to find the properties of such systems.
Module Learning Outcomes	Upon successful completion, students will: 19. Improve their problem-solving skills. 20. Apply that knowledge toward practical problems in different areas of science. 21. Utilize the computer capabilities to solve such problems using proper methods. 22. Learn how to represent any function as a power series, then use computer to solve it. 23. Learn the importance of differential equations for modeling almost any system, and how to solve it to find the properties of that system. 24. Learn the linear algebra and its importance in science.
Indicative Contents	Ordinary Differential Equations. Sequences and Series. Solution of Differential Equations by Power Series. Matrix Analysis.

Learning and Teaching Strategies	
Strategies	The primary strategy for delivering this module will be to encourage students to participate in the exercises while refining and expanding their critical thinking skills. This will be accomplished through classes, interactive tutorials, and the consideration of simple experiments involving sampling activities that students find interesting.

Student Workload (SWL)			
Structured SWL (h/sem)		**Structured SWL (h/w)**	
Unstructured SWL (h/sem)		**Unstructured SWL (h/w)**	

Total SWL (h/sem)			

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**				
	Assignments				
	Projects / Lab.				
	Report				
Summative assessment	**Midterm Exam**				
	Final Exam				
Total assessment					

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Ordinary Differential Equations: 4. First order (variables separable, homogeneous, linear and exact). 5. Second order homogeneous. 6. Second order nonhomogeneous; indeterminant coefficients, variation of parameters.
Week 2	
Week 3	
Week 4	
Week 5	Infinite Sequences and Series: 4. Limit laws, indeterminate forms and L'hospital rule. 5. Infinite series; convergence test. 6. Power series; Taylor and Maclaurin series.
Week 6	
Week 7	
Week 8	
Week 9	Solution of Differential Equations by Power Series: Power series method, Legendre's equation; Legendre s polynomials.
Week 10	
Week 11	
Week 12	
Week 13	Matrix Analysis: 5. Review of matrix theory, solving system of equations; Cramer's rule, inverse of the matrix method, Gauss elimination. 6. Eigen values and eigen vectors. 7. Diagonalization of matrices 8. Application of matrices to electric circuits.
Week 14	
Week 15	

Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Advanced Engineering Mathematics By KREYSIK	Yes
Recommended Texts	Calculus By Finney& Thomas	Yes
Websites		

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

Courses Table For Third Class

Electronic Engineering Deparatement								
Undergraduate Third Class								
Code	Subject	Hours/Week						Units
		First Term			Second Term			
		Th	Pr.	Tut	Th	Pr	Tut	
EE3301	Electronic – II	2	-	1	2	-	1	4
EE3201	Digital Signal Processing	2	-	1	2	-	1	٤
EE3302	Control engineering	3	-	1	3	-	1	6
EE3303	Microprocessor	2	-	1	2	-	1	4
EE3304A	Digital System Design I	2	-	1				2
EE3304B	Digital System Design II				2	-	1	2
EE3305	Communication	2	-	1	2	-	1	4
EE3306	Electronic Instrumentation	2	-	1	2	-	1	4
EE3307	Laboratory	-	6	-	-	6	-	4
Total		15	6	7	15	6	7	34
		28			28			

Total Theoretical : 15 Hour/Week

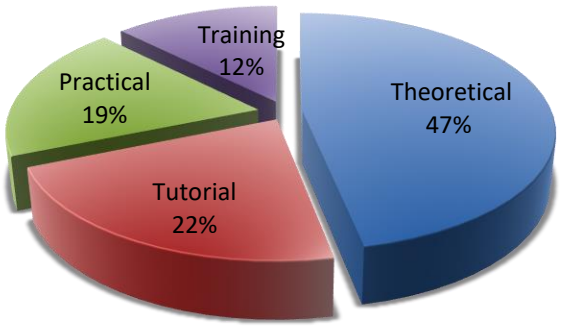
Total Practical :6 Hour/Week

Total Summer Training 4 Hour/Week

Total Tutorial :7 Hour/Week

Total Units :34

Weekly classes categories for the department



Third Year

- **Course Number: EE3301**
- **Course Name: Electronics II**
- **Credit Hours: (4,2,1,0) (Units, Theory, Tutorial, Practical)**

Course Content: The electronics course covers the area of analog electronic circuit design: Non linear application of op-amp, Filter design theory and approximation, Active filter design, Waveform generator theory and classification, Power amplifier classification.

- **Course Number: EE3201**
- **Course Name: Digital signal processing**
- **Credit Hours: (٤,3,0,0) (Units, Theory, Tutorial, Practical)**

Course Content: This course covers the following topics: review of discrete signals and systems, discrete fourier series, dicsretefourier transform, convolution and correlation, discrete and fast fourier transform, z- transform,framework for digital filter design,realization of digital filter, finite impulse response digital filter design, infinite impulse response digital filter design

- **Course Number: EE3302**
- **Course Name: Control Eng.**
- **Credit Hours: (6,3,0,0) (Units, Theory, Tutorial, Practical)**

Course Content: This course covers the following topics: i-continuous control system (System representation, Time domain analysis, State space analysis, Stability of system, Frequency response analysis, Design of control system) II-DIGITAL CONTROL SYSTEM (Z-transform, Sampled data control system, Time response analysis, Stability of system).

- **Course Number: EE3303**
- **Course Name: Microprocessor I**
- **Credit Hours: (4,2,1,0) (Units, Theory, Tutorial, Practical)**

Course Content: This course covers the following, Studying the 8086 microprocessor from software point of view, Studying the 8086 microprocessor from hardware point of view.

- **Course Number: EE3304A**
- **Course Name: Digital system design I**
- **Credit Hours: (2,2,1,0) (Units, Theory, Tutorial, Practical)**

Course Content: This course covers the following topics: Standard buses, programmable logic devices, PLC.Inductive proximity sensors: ultrasonic, Optical , Basic Elements of PLC, PLC inputs and outputs interfaces, Ladder programming, PLC Instructions: Latching, Comparisons, Timers, Counters,Sequencers, Shift Registers

- **Course Number: EE3304B**
- **Course Name: Digital system design II**
- **Credit Hours: (2,2,1,0) (Units, Theory, Tutorial, Practical)**
- Course Content:Programmable Logic Devices, GAL, SPLD, CPLD, OLMC, ISP, FPGA
- Introduction to VHDL, Modeling flip-flops using VHDL process, Compilation and simulation of VHDL code, Modeling a sequential machine,Variables, Signals and Constants, Arrays

- **Course Number: EE3305**
- **Course Name: Communication**
- **Credit Hours: (4,2,1,0) (Units, Theory, Tutorial, Practical)**

Course Content:the course cover transmission lines, Analog input analog output schemes, Digital input analog output schemes, analog input digital output schemes, Digital input Digital output schemes.

- **Course Number:EE3306**
- **Course Name: Electronic Instrumentation**
- **Credit Hours: (4,2,1,0) (Units, Theory, Tutorial, Practical)**

Course Content: This course covers the following topics: instrumintation errors, transducers, signal conditioning, signal conversion, instrumentation amplifier, analog electronic instruments, digital instruments, and interface buses.

- **Course Number: EE3307**
- **Course Name: Laboratory**
- **Credit Hours: (4,0,0,6) (Units, Theory, Tutorial, Practical)**

Course Content: The principle objective is to ensure that the student have the ability to integrate concepts and achieve the practical works for the different topics he attend in the theoretical classes. Each student should submit a written technical report for each experiment.

University Of Ninevah
College of Electronics Engineering
Electronic Engineering Department

Class			**Third**	**Theory :**	**2Hrs/wk**
Subject			**Electronic II**	**Tutorial**	**1 Hrs/wk**
Code	**EE3301**	**Unit**	**4**	**Practical**	**Hrs/wk**

Article	Hrs
OP-AMP Applications: inverting, non-inverting amplifier, buffer, summing amplifier, difference amplifier, integrator and differentiator , comparator, sample and hold, zero crossing detector, peak detector, precision diode and fast rectifier, analog computation.	**12**
Filters: Filter approximations, passive RLC design, active filter design methods (ladder, and cascaded design technique).	**9**
Oscillators : BarkHausen´s criteria for oscillators ; Satiability concept Three pole amplifier ; Nyquist criteria ; Stabilizing networks ; frequency compensation and sinusoidal oscillator ; phase shift , Wien bridge , Colpitts , Hartley , Crystal and Tune circuit type oscillator (AF &RF Range).	**9**
Tuned Amplifier: Introduction to single tuned amplifier ; G.B. response calculations & design ; Cascade amplifier ; Neutralization methods ; Synchronously tuned amplifier ; Elementary treatment of stagger tuned and doubly tuned amplifiers .	**9**
Audio Frequency Linear Power Amplifiers: Introduction to Class A, B, AB, a ,C operation , Class A – common –emitter power amplifier ; Transformer coupled amplifier ; Class push –pull power amplifier ; Amplifiers using complementary symmetry ; Class C amplifier .	**12**
Comparators and Converters : Zero crossing detector , Schmitt trigger , Comparator ,Voltage limiters and window detector , Clippers and clampers , Peak detector , introduction to A / D and D /A converters and sample and hold circuit .	**9**
Multivibrators: Astable, monostable, 555 timer, and bistable	**12**
Integrated Circuits and Devices : Introduction of IC families ; Fabrication Steps and evolving transistor , Diode and Resistor ; capacitors families.	**9**
Specialized ICApplications : phase locked loops , ICL 8038 function generator , Voltage Controlled Oscillator , XR 2240 programmable timer / counter .	**9**
Total	**90**

Text book:
1: Integrated electronics by Milmann
2: Microelectronics by Milma

University Of Ninevah
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Class	**Third**			**Theory :**	**2 Hrs/wk**
Subject	**Digital Signal Processing**			**Tutorial**	**1 Hrs/wk**
Code	**EE3201**	**Unit**	**4**	**Practical**	**Hrs/wk**

Article	Hrs
Review of Discrete Signals and Systems	**6**
Discrete Fourier Series: Spectra of periodic digital signals، Properties of series.	**9**
Dicsrete Fourier Transform: Properties، Frequency response of LTI systems**.**	**9**
Convolution and Correlation	**6**
DISCRETE AND FAST FOURIER TRANSFORM	**9**
Z- Transform: Review، Z-plane poles and zeros**.**	**9**
Framework for Digital Filter Design	**6**
Finite Impulse Response Digital Filter Design: window method، frequency sampling method، realization of FIR.	**12**
Infinite Impulse Response Digital Filter Design: Pole-zero method، Bilinear Z-transform، Realization of IIR**.**	**12**
Applications of Filter Banks in DSP	**12**
Total	**90**

Text book:
1: " Digital Signal Processing", By Emmanuel and Barrie
2: "Digital Signal Processing with Computer Applications", John Wiley & Sons , 1997 By PAUL A. LYNN

University Of Ninevah
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Class	**Third**			**Theory :**	**3 Hrs/wk**
Subject	**Control Engineering**			**Tutorial**	**1 Hrs/wk**
Code	**EE3201**	**Unit**	**6**	**Practical**	**Hrs/wk**

Article	Hrs
Introduction And Basic Definition: Closed Loop And Open Loop, Control Systems	**3**
Transfer Fonction: Electrcal System; Mechanical System; Servo System.	**6**
Block Diagram: Block Diagram Reductioin Algebra.	**3**
Signal Flow Graph: Mason Gain Rule.	**6**
Time Respnse: Typical Test Signals &Types Of System; Steady StateErrors; Transient Responseof 1st and 2nd Order System.	**9**
Stability Of Control System: Routh-Hurwtiz Criterion:	**3**
Root Locus Analysis: Root Locus Plot;General Rules Of Constructing Root Loci; Root Locus Analysis Of Control Systems	**9**
Frequency Response: Introduction To Frequency Response.	**3**
Bode Plot: Bode Analysis; Rules For Sketching The Bode Plots;Phase And Gain Margines; Relative Stability.	**9**
ContRol System Design By Frequency Response: Proportional Gain Only; Lead Compensation; Lag Compensation.	**12**
The PID Controller; Definition; Tuning By Ziegler-Nicholes Methods.	**6**
Digital Control Systems :Z- Trans Form &Inrevse Z-Transfrom; PulseTransfer Function ; Open Loop And Closed Loop Responses Of Discrete-TimeSystems;Descretization Methods; Stability Test For Digital Control System (Jury's Test).	**15**
State-Space Analyses: State Equation; Solution Of State Equation;Controlabilityand Observability.	**6**
Total	**90**

Text book:
1: "AUTOMATIC CONTROL SYSTEM" ByB. KUO 2001
2: "MODERN CONTROL SYSTEM" ByK.OGATA 2001

University Of Ninevah
College of Electronics Engineering
Electronic Engineering Department

Class	**Third**			**Theory :**	**2 Hrs/wk**
Subject	**Microprocessors I**			**Tutorial**	**1 Hrs/wk**
Code	**EE3303**	**Unit**	**4**	**Practical**	**Hrs/wk**

Article	Hrs
Introduction to 16bit Microprocessor: 8086 /8088 Architecture , Machine language, instruction , Internal execution and timing .	**6**
8086/8088 Family Assembly Language Programming: Data Transfer instructions ;Arithmetic instructions, logical, Shift and rotate instructions ; Branch instructions ; Loop instruction;NOP ; HLT and flag manipulation instructions; Assembler directives.	**12**
8086 System Connections and Timing : 8086 Hardware overview ; Basic Signal flow on 8086 buses ;Analyzing a minimum mode system; 8086 addressing and address decoding ; 8086 timing parameter .	**12**
Interrupts and Interrupt Service Procedure : 8086 interrupts and interrupt response ; 8086 interrupt types ; Hardware and software consideration for using interrupt .	**12**
I/O Programming : Fundamentals I/O consideration ;Programmed and interrupt I/O ; Block transfers and DMA ,I/O design example .	**12**
Interfacing : Programmable Parallel ports and handshake input/ output ; Interfacing microprocessors to keyboard and display ; D/A converter operation ; Interfacing and applications ;A/D converter ; Specifications and interfacing ; Serial communication interfaces .	**12**
Parallel I/O and Interfacing Application : Basic interfacing concepts 8255 Program Peripheral Interface ; Interfacing displays ; Keyboards;, 8279 Programmable keyboard interface;, interfacing memory ; Memory ; Mapped I/O .	**12**
General Purpose Programmable Peripheral Devices: 8253 Programmable Timer 8257 controller , 8259 interrupt controller .	**12**
Total	**90**

Text book:
1: "The Intel Microprocessor"By BARRY B. BREY,
2: "The 8088 & 8086 mp`s programming , interfacing S/W, H/W &applications", PrenticeHall, 2003 ByW. A. Triebel& A. Singh

University Of Ninevah
College of Electronics Engineering
Electronic Engineering Department

Class			**Third**	**Theory :**	**2 Hrs/wk**
Subject			**Digital System Design I**	**Tutorial**	**1 Hrs/wk**
Code	**EE3304A**	**Unit**	**2**	**Practical**	**Hrs/wk**

Article		**Hrs**
Programmable Logic Controller PLC Basic Components & Their symbols		3
Control Transformer switches , relays , time delay relays		1
References Designators: on ,off ,Run ,stop, cycle		3
Inductive proximity sensors: ultrasouic, Optical		1
Analog Input / output		3
Basic Elements of PLC		3
PLC inputs and outputs interfaces		3
Ladder programming		6
PLC Instructions: Latching, Comparisons,		6
Timers, Counters,		6
Sequencers, Shift Registers		2
Math Instructions: ADD, SUB, MUL, DIV, CLV, CLR, SQR Move & Logic Instructions: MOV, MVM, AND, OR, NOR, NOT,CLR		2
Standard Buses		3
Internal, External buses, Serial, Parallel buses		3
	Total	45

Text book:
1: Digital Fundamental, Floyd
2: PLC Software Manual

University Of Ninevah
College of Electronics Engineering
Electronic Engineering Department

Class			**Third**	**Theory :**	**2 Hrs/wk**
Subject			**Digital System Design II**	**Tutorial**	**1 Hrs/wk**
Code	**EE3304B**	**Unit**	**2**	**Practical**	**Hrs/wk**

Article	**Hrs**
Programmable Logic Devices GAL, SPLD, CPLD, OLMC, ISP, FPGA	9
V-Hardware Description Language (VHDL)	3
Introduction to VHDL	3
VHDL description of combinational network	3
Modeling flip-flops using VHDL process	3
Compilation and simulation of VHDL code	3
Modeling a sequential machine	3
Variables, Signals and Constants	3
Arrays	3
VHDL operators, functions, procedures Packages and Libraries	3
Memory Expansion, RAM, ROM	3
System Projects	6
Total	45

Text book:
1: Digital Fundamental, Floyd
3: Digital System Design using VHDL By Charles H

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Class			**Third**	**Theory :**	**2 Hrs/wk**
Subject			**Communication**	**Tutorial**	**1 Hrs/wk**
Code	**EE3305**	**Unit**	**4**	**Practical**	**Hrs/wk**

Article	Hrs
Transmission lines: Equivalent circuit, characteristic impedance, phase velocity, reflection coefficient, standing waves, quarter – wave transformer, smith chart calculation and stub matching.	**15**
Analog Input Analog Output Schemes: Amplitude Modulation ; Equation for AM, modulation index, spectrum of AM, DSB transmission with and without carriers, VSB transmission, DSB,C amplitude modulators, Envelope detectors, Balanced Modulator, SSB signal generation and Demodulation schemes.	**15**
Frequency modulation: Equations for FM, modulation Index, spectrum calculation for sinusoidal waveform and Bessels function table, phase modulation, relationship between FM and PM, NBFM, frequency modulators (Armstrong method) Types of noise in AM and FM systems.	**15**
Digital Input Analog Output Schemes : ASK, FSK, QAM, BPSK, QPSK, Transmitter and receiver block diagrams.	**15**
Analog Input Digital Output Schemes : Various pulse modulation methods, pulse code modulation PCM, Delta modulation DM. Comparison between PCM and DM, Compounding method, Noise in digital systems.	**15**
Digital Input Digital Output Schemes : Line encoding methods : NRZ, RZ, Manchester, and multilevel encoding methods and comparison of these schemes	**15**
Total	**90**

Text book:
1: principle of communication engineering by Anokh Singh

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Class	**Third**			**Theory :**	**2 Hrs/wk**
Subject	**Electronic Instrumentation**			**Tutorial**	**1 Hrs/wk**
Code	**EE3306**	**Unit**	**4**	**Practical**	**Hrs/wk**

Article	Hrs
INSTRUMINTATION ERRORS	**6**
TRANSDUCERS: Resistive, Capacitive, Inductive. Active Transducers.	**9**
SIGNAL CONDITIONING: Input signal modification, scaling of measuring variables, delay lines, noise, signal averaging, interference, grounding, shielding, signal filtering, signal correlation, current-mode amplifier.	**12**
SIGNAL CONVERSION: Conversion by transducer bridge, electronic multipliers, signal generator, a.c to d.c signal conversion, logic elements, sample & hold, A/D and D/A signal conversion, isolation amplifier	**12**
INSTRUMENTATION AMPLIFIER: Circuit design, characteristics, CMMR	**9**
ANALOG ELECTRONIC INSTRUMENTS: Analog (voltmeter, multi-meter, vector impedance meter, frequency meter, distortion analyzer, spectrum analyzer.	**15**
DIGITAL INSTRUMENTS: Digital indicator, voltmeter (dual slop, multi-slop, successive approximation, and voltage to frequency converter, ammeters, ohmmeters, multi-meters, counters (frequency, frequency ratio meter, time-interval meter, energy meter), digital multiplexers, microprocessor-based meters	**15**
INTERFACE BUSES: Parallel port, RS-232, GPIB.	**12**
Total	**90**

Text book:
1: "Electronic Instrumentation and Measurement Techniques" ByWillliam David Cooper and Albert D. Helfrick.
2: Principles of Measurement systems By John P. Bentley
3: Electrical and Electronic Measurement By Ahmed A.Montaser and Karam A. sharshar

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Class			**Third**	**Theory :**	**Hrs/wk**
Subject			**Laboratory**	**Tutorial**	**Hrs/wk**
Code	**EE2307**	**Unit**	**4**	**Practical**	**6Hrs/wk**

Article	**Hrs**
The principal objective is to ensure that students have a good quality capstone design & experience to integrate concepts from a range of classes in the core. The students are to apply modern engineering practicesand techniques. Each student should submit a written technical report for each experiment. The experiments cover the related topics in electronic circuit analysis, communication system and microprocessor technology.	
Total	**180**

Text book:
1:
2:
3:

Courses Table for Fourth Class

Electronic Engineering Deparatement								
Undergraduate Fourth Class								
Code	Subject	Hours/Week						Units
		First Term			Second Term			
		Th	Pr.	Tut	Th	Pr	Tut	
EE4301	Industrial Electronic	2	-	1	2	-	1	4
EE4302	Data Transmission&ComputerNetwork	2	-	1	2	-	1	4
EE4303	MicroController(*)	2	-	1				2
EE4309	Microprocessor II(*)				2	-	1	2
EE4304	Microelectronics	2	-	-	2	-	-	4
EE4308	Antenna &Propogation(*)				2	-	1	2
EE4305	Radiation(*)	2	-	1				2
EE4306	Computer aided design	2	-	1	2	-	1	4
EE4201	Engineering Project	1	3	-	1	3	-	4
EE4307	Laboratory	-	6	-	-	6	-	4
Total		13	9	5	13	9	5	32
		27			27			

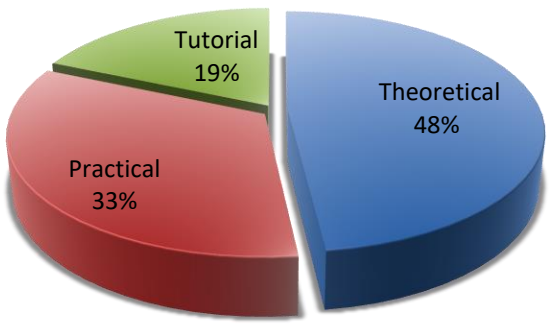
Theoretical : 13 Hour/Week

Total Practical :9 Hour/Week

Total Tutorial :5 Hour/Week

Total Units :32

Weekly classes categories for the department



Fourth Year

- **Course Number: EE4301**
- **Course Name: Industrial Electronic**
- **Credit Hours: (4,2,1,0) (Units, Theory, Tutorial, Practical)**

Course Content: This course cover the power semiconductor devices, Phase control converters, Thyristor commutation techniques, Inverters, PWM and speed control.

- **Course Number: EE4302**
- **Course Name: Data Transmission and Computer Networks**
- **Credit Hours: (4,2,1,0) (Units, Theory, Tutorial, Practical)**

Course Content: Definitions and standards, Transmission media, OSI and TCP/IP models, Connecting devices. Data link control and data link protocols, LAN technologies, WLAN standards and devices, WAN and Wireless WAN.

- **Course Number: EE4309**
- **Course Name: Microprocessor II**
- **Credit Hours: (2,2,1,0) (Units, Theory, Tutorial, Practical)**

Course Content: Introduction to Advanced Microprocessors, The 80386 and 80486 Microprocessor, Assembly language and Programming,

- **Course Number: EE4303**
- **Course Name: Microcontroller**
- **Credit Hours: (2,2,1,0) (Units, Theory, Tutorial, Practical)**

Course Content: Microprocessors and Microcontrollers, The MCS-51 Architecture, Basic Assembly Language Programming Concept, An MCS-51 Microcontroller Design

- **Course Number: EE4304**
- **Course Name: Microelectronics**
- **Credit Hours: (6,3,0,0) (Units, Theory, Tutorial, Practical)**

Course Content: The microelectronics course covers the area of integrated circuit design. The fabrication of electronic devices, and design and analysis of analog and digital integrated circuits.

- **Course Number: EE4305**
- **Course Name: Radiation**
- **Credit Hours: (2,2,1,0) (Units, Theory, Tutorial, Practical)**

Course Content: Give the students an overview of microwave technology and introduction to Microwave devices.

- **Course Number: EE4308**
- **Course Name: Antenna and Propagation**
- **Credit Hours: (2,2,1,0) (Units, Theory, Tutorial, Practical)**
- **Course Content:** Antenna Theory (Principles of radiation and equivalent circuit)
, Dipole antenna, Array antenna, Reflector Antenna (Parabolic antenna), Ground wave propagation (Direct and Reflected), IonsphericPropagation ,Radar theory (Circuits and equations)

- **Course Number: EE4306**
- **Course Name: Computer aided design**
- **Credit Hours: (4,2,1,0) (Units, Theory, Tutorial, Practical)**

Course Content: This course covers the following topics: Numerical solution for Linear and nonlinear circuit ,DC and AC matrix analysis ,two port analysis ,graph theory , Simulation ,State variable analysis, Sensitivity, Optimization, CAD for integrated circuits, Genetic Algorithm .

- **Course Number: EE4201**
- **Course Name: Engineering Project**
- **Credit Hours: (4,1,0,3) (Units, Theory, Tutorial, Practical)**

Course Content: Collaboration team work in research environment is expected including extensive interaction with other students. Each group should submit a written report and should attend the final oral examination.

- **Course Number: EE4307**
- **Course Name: Laboratory**
- **Credit Hours: (4,0,0,6) (Units, Theory, Tutorial, Practical)**

Course Content: The principle objective is to ensure that the student have the ability to integrate concepts and achieve the practical works for the different topics he attend in the theoretical classes. Each student should submit a written technical report for each experiment.

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Class			**Fourth**	**Theory :**	**2Hrs/wk**
Subject	**Data Transmission & Computer Networks**			**Tutorial**	**1 Hrs/wk**
Code	**EE4302**	**Unit**	**4**	**Practical**	**Hrs/wk**

Article	Hrs
Introduction and Definitions: Data Communication، Networks، Protocols، Standards، and Standard organizations.	**3**
BASIC CONCEPTS:- Line configuration، Topology، Categories of networks.	**6**
Transmission Media: Electromagnetic spectrum.,Guided media: Unshielded Twisted Pair (UTP) Cable., Shielded Twisted Pair (STP) Cable., Coaxial Cable., Optical Fiber., Unguided media: Radio Transmission., Microwave Transmission., Satellite Microwave.	**9**
Interfaces and Modems: Data transmission: parallel، serial، synchronous and asynchronous.,DTE-DCE interface and standards., Modems.	**6**
The OSIand TCP/IP Models	**6**
Networking and Internetworking Devices: Networking devices: NICs، Hubs، Repeaters، Bridges and Switches.,Internetworking devices: Router and Gateways.	**6**
Data Link Control: Link Discipline، Flow control، Error control.	**6**
Data Link Protocols: Asynchronous protocols، Synchronous protocols.	**3**
Local area Network (LAN): Ethernet ,Token Bus, project 802, Token Ring, FDDI.	**12**
TCP/IP Modeland Protocols	**9**
Wireless LAN (WLAN): Introduction and history of (WLANs)، Standardization and frequency bands، IEEE 802.11 standard، WIFI، WIMAX، Bluetooth.	**9**
Wide Area Network (WAN)	**6**
Wireless WAN	**6**
Internet Working and Internet	**3**
Total	**90**

Text book:

1: "Introduction to Data Comm. And Networking"، ByPehrouzForouzan.
2: "Computer Networks and Internets"،Douglas ByE. Comer (4th edition)

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Class	**Fourth**			**Theory :**	**2 Hrs/wk**
Subject	**Industrial Electronic**			**Tutorial**	**1 Hrs/wk**
Code	**EE4301**	**Unit**	**4**	**Practical**	**Hrs/wk**

Article	Hrs
Introduction : Scope of power electronics , power converter specification . **Power Semiconductor Devices :**Thyristor families , V-I characteristics of SCR , Triac , GTO , Diac , Source of thyristor triggering , turn On \ turn Off characteristic and Gate triggering requirements, series/parallel operation, device ratings.	**12**
Power Transistor devices: Basic structure and V-I characteristics of power MOSFET,IGBT,SIT. Switching characteristic, Gate/Base drive circuits, Safe operating area, di/dt / dv/dt limitation, series/parallel operation, ratings.	**12**
Phase Control Converters: Signal phase central taped transformer connection , half controlled and fully controlled Bridge configuration , three phase half controlled Bridge converters , Use of flywheeling diode operation with resistive , inductive and Back EMF load , line commutated inverter , effect of source inductance on converter performance , power factor , ripple factor calculation , firing scheme , linear alpha and cosine angle control , application of D.C motor speed control , regulated power supply , battery charger	**18**
ThyristorCommutation Techniques: Natural commutation , Force commutation ,Voltage / Current commutation , DC chopper , Principle of Voltage control , analysis of Morgan chopper circuit , Johns chopper circuit, regenerative chopper circuit .	**15**
Inverters : Single phase series and parallel inverters , classification of CSI and VSI inverters , single phase and three phase inverter circuit , methods of voltage controlled inverter circuits , comparison of thyristor and transistor, based inverters, application to speed control of AC motors , uninterrupted power supply , induction melting , heating furnaces .	**15**
Industrial Applications: DC Motor Control, Induction Motor Control, Pulse width Modulation & Speed Control, Static Relays & Contactors.	**12**
Total	**90**

Text book:

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Class	**Fourth**			**Theory :**	**2 Hrs/wk**
Subject	**Microprocessor II**			**Tutorial**	**1 Hrs/wk**
Code	**EE4309**	**Unit**	**2**	**Practical**	**Hrs/wk**

Article	Hrs
• **Introduction to Advanced Microprocessors :** Overview of 80186,80286 , 80386 , 80486 Architecture , Descriptor table , Privilege levels , paging . Detail study of Pentium , Pentium MMX architecture , Pentium II , Memory and Microprocessor , The Programming Model , Real mode and protected mode Memory addressing , Data formats .	**12**
• **The 80386 and 80486 Microprocessor :** Architecture – Real mode and Protected mode , 80386 Memory Management , Memory segmentation , Memory paying Mechanism , On chip cache organization .	**12**
Assembly language and Programming concepts : The instruction set , Addressing modes , Data movement instructions , Arithmetic and logic instructions , programming the Microprocessor .	**12**
• **Interfacing and Applications :** Memory interfacing , Basic **I /O** interfacing .	**9**
Total	**45**

Text book:
1: "The 80386-80486 and Pentium processor" By Walter A. Tribel;
2: "The Intel Microprocessors " By Barry B. Bery
3: "The 8051 micro-controller" By I. Scott Mackenzie.

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Class	**Fourth**			**Theory :**	**2 Hrs/wk**
Subject	**Microcontroller**			**Tutorial**	**1 Hrs/wk**
Code	**EE4303**	**Unit**	**2**	**Practical**	**Hrs/wk**

Article	Hrs
Microprocessors and Microcontrollers : Comparing Microprocessors and Microcontrollers , The Z80 and MCS 51 , Microcontroller survey .	**6**
Microprocessor & Micro Controller : Comparing Microprocessors and Microcontrollers, , Micro Controller survey.	**9**
The MCS-51Architecture : Introduction, MCS-51 family microcontrollers hardware, Input/output pin, ports and circuits, External memory interfacing, counter, timer, serial data input/output, Interrupts.	**9**
Basic Assembly Language Programming Concept : Addressing mode, External data, move, Code memory read – only data moves, Push and Pop opcodes, Data Exchanges, Logical operations, Arithmetic operations, Branching Instructions, Interrupts and Returns.	**12**
An MCS-51 Microcontroller Design : Microcontroller Specification, External memory and Memory space Decoding, Expanding I/O , Memory map I/O , Memory address decoding, Testing the Design, Lookup table for the 8051, Serial data Transmission.	**9**
Total	**45**

Text book:
1: "The 80386-80486 and Pentium processor" By Walter A. Tribel;
2: "The Intel Microprocessors " By Barry B. Bery
3: "The 8051 micro-controller" By I. Scott Mackenzie.

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Class			**Fourth**	**Theory :**	**3 Hrs/wk**
Subject			**Microelectronics**	**Tutorial**	**Hrs/wk**
Code	**EE4304**	**Unit**	**6**	**Practical**	**Hrs/wk**

Article	Hrs
Semiconductor Fundamental : Energy band model of solid, intrinsic and extrinsic semiconductor, free carrier density in semiconductor, carrier concentration and Fermi level. Carrier transport and recombination, carrier diffusion, the drift current, Hall effect. MIS, MOS, Schottky barriers, magnetic effect, bipolar junction, p-n junction, FET.	**6**
IC fabrication processes : Crystal growth, diffusion, doping, evaporations, and photo masking, Ion implementation, Thin and thick film fabrication, sputtering, mounting, package, and hybrid integrated circuits**.**	**12**
LSI and VLSI Design and Application : Discrete device design, bipolar transistor fundamental, technology, and miniaturization. Linear I.C's: fabrication, and general consideration. Current sources,. LSI oriented bipolar technology. Logic Families based on bipolar transistor (RTL, DTL, TTL, ECL, TRL, I^2L). TTL gate circuit analysis. Metal-Semiconductor junction, Metal-Oxide Semiconductor junction. FET theory and analysis.	**18**
MOS Transistor Fundamentals and MOS I.C Technology :MOS capacitor, static characteristics of the MOS transistor, MOS device fabrication. MOSFET's. Logic circuits based on MOSFET, PMOS, NMOS, CMOS,DMOS, SOS, VMOS. NMOS inverter and gate circuit analysis. CMOS inverter and gate circuit analysis. Charge-coupled devices and non-volatile memory devices, software applications.	**18**
ASIC Design methodologies and system design consideration	**9**
LCA, Standard cell, Gate array, Structured array]	**9**
Full-Custom and Semi-Custom Design :Design motivations; design either discrete component, full-custom and semi-custom design approaches**.**	**9**
Field programmable gate arrays FPGA and Field programmable analog arrays FPGA	**9**
Total	**90**

Text book:
1: Microelectronic By Millmann
2:Pprinciple of CMOS VLSI Design By Neil Weste and KarmranEshrahian

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Class			**Fourth**	**Theory :**	**2 Hrs/wk**
Subject			**Radiation**	**Tutorial**	**1 Hrs/wk**
Code	**EE4305**	**Unit**	**2**	**Practical**	**Hrs/wk**

Article		**Hrs**
Various applications of Microwaves, Review of Maxwell's Equations		**3**
Review of Electromagnetic Theory: (Plane wave incidence on boundaries, Reflection &transmission)		**3**
Waveguide Theory		**3**
Rectangular Waveguides		**3**
Circular Waveguides		**3**
S-parameters and the scattering Matrix		**3**
Tee junctions & Magic Tee		**3**
Attenuators, Directional couplers		**3**
Propagation into Ferrites, Ferrites Devices		**3**
Active Microwave Device, Two cavity Klystron		**3**
Velocity Modulation, Power and Efficiency		**3**
The Reflex Klystron, Power and frequency characteristics, Magnetron		**3**
Passive Microwave Devices, Detector Diodes, power sensing diode,		**3**
Varactor diodes, PIN diodes, BARITE & IMPATT diodes		**3**
Microwave Transistor circuit		**3**
	Total	**90**

Text book:
1: "Microwave Circuits and devices" by Liao
2: Microwave Engineering" by Pozar

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Class	**Fourth**			**Theory :**	**2 Hrs/wk**
Subject	**Antenna and Propagation**			**Tutorial**	**1 Hrs/wk**
Code	**EE4308**	**Unit**	**2**	**Practical**	**Hrs/wk**

Article		Hrs
Antenna Theory (Principles of radiation and equivalent circuit)		**3**
Antenna Parameters (Gain, Directivity, Bandwidth, Beam width, and Radiation Pattern)		**3**
Radiation Intensity and Power Density of Antennas		**3**
Monopole antenna		**3**
Dipole antenna		**3**
Array antenna		**3**
Reflector Antenna (Parabolic antenna)		**3**
Microstrip antenna		**3**
Free space propagation		**3**
Friis Transmission Formula		**3**
Ground wave propagation (Direct and Reflected)		**3**
Ionspheric Propagation		**3**
Radar theory (Circuits and equations)		**3**
Satellite communication		**3**
Mobile and 2-Ray model		**3**
	Total	**90**

Text book:
1: “Microwave Circuits and devices” by Liao
2: Microwave Engineering” by Pozar

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Class			**Fourth**	**Theory :**	**2 Hrs/wk**
Subject	**Computer Aided design**			**Tutorial**	**1 Hrs/wk**
Code	**EE4306**	**Unit**	**4**	**Practical**	**Hrs/wk**

Article	Hrs
Introduction Linear circuits, A.C circuits, A.C circuits matrix analysis, two port analysis, graph theory. Numerical solution for nonlinear network simple search algorithm convergence properties, secant method.	**12**
Simulation Algorithms , stability and accuracy in Eulers methods , higher-order , Runge-kutto Algorithms.	**15**
State variable analysis Generation of state equation from topological data , finding a tree, solution of state equations.	**18**
Sensitivity analysis Sensitivity measures , sensitivity calculation tolerance analysis.	**9**
Optimization Gradient algorithms , numerical solution of gradient algorithm , stability , search methods.	**12**
C.A.D for integrated circuits Layout algorithm routing algorithm , testability analysis.	**15**
Genetic algorithms Application of GA in electronics.	**9**
Total	**90**

Text book:
1: Computer Assisted Network and System Analysis by: by Mastacusa

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Class	**Fourth**			**Theory :**	**1 Hrs/wk**
Subject	**ENGINEERING PROJECT**			**Tutorial**	**Hrs/wk**
Code	**EE4201**	**Unit**	**4**	**Practical**	**3Hrs/wk**

Article	Hrs
Collaborative team work of the nature in a research environment is expected, including extensive interaction with other students. Each student should submit a written technical report and should attend the final oral examination . The students apply verbal written and oral technical skills to document the design process .	
Total	**120**

Text book:
1:

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Class			**Fourth**	**Theory :**	**Hrs/wk**
Subject			**Laboratory**	**Tutorial**	**Hrs/wk**
Code	**EE4307**	**Unit**	**4**	**Practical**	**6Hrs/wk**

Article	**Hrs**
The principle objective is to ensure that students have a good quality capstone design & experience to integrate concepts from a range of classes in the core. The students are to apply modern engineering practices and techniques. Each student should submit a written technical report for each experiment.	
Total	**180**

Text book:
1:

وصف المقررات للمراحل الاولى والثانية حسب نظام بولونيا والثالثة والرابعة سنوي

Courses specification for second, third, and fourth class

للعام الدراسي ٢٠٢٣ - ٢٠٢٤

جامعة نينوى

كلية هندسة الالكترونيات

قسم هندسة الالكترونيك