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

دليل وصف البرنامج الأكاديمي والمقرر الدراسي

2025

المقدمة:

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

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

ويتضمن هذا الدليل بنسخته الثانية وصفاً للبرنامج الأكاديمي بعد تحديث مفردات وفقرات الدليل السابق في ضوء مستجدات وتطورات النظام التعليمي في العراق والذي تضمن وصف البرنامج الأكاديمي بشكلها التقليدي نظام (سنوي، فصلي) فضلاً عن اعتماد وصف البرنامج الأكاديمي المعمم بموجب كتاب دائرة الدراسات ت م2906/3 في 2023/5/3 فيما يخص البرامج التي تعتمد مسار بولونيا أساساً لعملها.

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

مفاهيم ومصطلحات:

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

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

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

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

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

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

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

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

نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة .... النهرين .....

الكلية/ المعهد: كلية ....هندسة معلومات.....

القسم العلمي: قسم .....شبكات الحاسوب.....

اسم البرنامج الأكاديمي او المهني: بكالوريوس .....هندسة شبكات الحاسوب

اسم الشهادة النهائية: بكالوريوس في .هندسة شبكات الحاسوب.....

النظام الدراسي: فصلي

تاريخ اعداد الوصف: 24-4-2025

تاريخ ملء الملف: 24-6-2025

الوقيع

اسم رئيس القسم: ا.م.د. عمار داود جاسم

التاريخ ٢٤/٧/٢٠٢٥

الوقيع

اسم المعاون العلمي: ا.م.د. محمد عماد عبد الستار

التاريخ ٢٤/٦/٢٠٢٥

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي

التاريخ ٢٥/٦/٢٤

التوقيع

جامعة النهرين
شعبة ضمان الجودة والأداء الجامعي

العميد

أ.د. حكمت نجم عبد الله
العميد

مصادقة السيد

1. رؤية البرنامج
أن نكون برنامجًا واقعيًا ومتميزًا في هندسة شبكات الحاسوب في بغداد والمنطقة ومتميزين كمهندسي شبكات ذوي جودة عالية.

2. رسالة البرنامج
1. إعداد هندسي كممارسين وقادة المستقبل. 2. تبني نهج حساس للتغيير في المناهج الدراسية المعتمدة على نظام المقررات والتي تستجيب لاحتياجات صناعات شبكات الكمبيوتر المهيمنة والمتنامية في العالم. 3. تقديم البحوث الحديثة عالية الجودة النظرية والتطبيقية على حد سواء. 4. تقوية الشراكات التي تسهل التعاون في صناعة شبكات الكمبيوتر والحكومة والتعليم. 5. دعم التطوير التكنولوجي والابتكار الذي يلبي احتياجات المجتمع المحلي. 6. يجب أن تتماشى عمليات تقييم البرنامج الاختلافات بين برامج هندسة الشبكات.

3. اهداف البرنامج
خريجو قسم شبكات الحاسوب سيكونون: 1. مهندين منتجين وممارسين. 2. المهندسين المحترفين القادرين على حل المشاريع الواقعية والذين يطبقون الحلول التكنولوجية لاحتياجات العمل. 3. الباحثون الذين يساهمون في تطوير وابتكار مجالات شبكات الكمبيوتر. 4. متهيئين من الناحية الفنية التي تشمل (القدرة التصميمية ، التجارب المعملية ، استخدام الأدوات الهندسية) والعناصر غير الفنية (العمل الجماعي ، الاتصالات) التي تدعم التنمية الاقتصادية والاجتماعية للمجتمع المحلي. 5. المتعلمين الذين يمكن أن تحسن دائما المعرفة المهنية.

4. الاعتماد البرامجي

لا يوجد

5. المؤثرات الخارجية الأخرى

وزارة التعليم العالي والبحث العلمي

6. هيكلية البرنامج

هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات *
متطلبات المؤسسة	**9**	**16**	**11.76%**	
متطلبات الكلية	**8**	**24**	**17.65%**	
متطلبات القسم	**30**	**96**	**70.59%**	
التدريب الصيفي	صيف المرحلة الثالثة			
أخرى				

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

7. وصف البرنامج

السنة / المستوى	رمز المقرر أو المساق	اسم المقرر أو المساق	الساعات المعتمدة	
			نظري	عملي
2024-2025 / الاولى	**ENLA130**	اللغة الانكليزية 1	2	
	CALC101	تفاضل وتكامل 1	3	
	PHYS102	الفيزياء	2	2
	BIOL103	بايولوجي	3	
	ITFN104	اساسيات تكنولوجيا المعلومات	2	2
	EDAC105	الرسم الهندسي والتصميم بالحاسوب	2	2
	HURI110	حقوق الانسان	1	
	ARLA120	اللغة العربية	1	
	CALC150	تفاضل وتكامل 2	3	
	CFPR151	اساسيات الحاسوب والبرمجة	2	2

	LODS152	التصميم المنطقي	2	2
	ELCA153	تحليل الدوائر الكهربائية	2	2
	FNET154	اساسيات الشبكات	2	2
2025-2024 / الثانية	ENGL200	اللغة الانكليزية 2	2	
	EGMM201	رياضيات هندسية 1	3	
	PBST202	احتمالية واحصاء	3	
	ELPH203	القيزياء الالكترونية	2	2
	OOPJ204	البرمجة الشيئية الموجهة- جافا	2	2
	WEBP205	مقرر اختياري	2	2
	PRMG255	مقرر اختياري	2	
	EGMM251	رياضيات هندسية 2	3	
	SGAN252	تحليل الاشارات	2	2
	DSDD253	تصميم النظم الرقمية	2	2
	INCO254	نظرية المعلومات والترميز	3	
	DDBB259	مقرر اختياري	2	2
2025-2024 / الثالثة	DEMO300	ديمقراطية	2	
	NUMD301	الطرق العددية	2	2
	CNET302	شبكات حاسوب	2	2
	COMM303	اتصالات البيانات	2	2
	OSYS304	مقرر اختياري	2	2
	AINT307	مقرر اختياري	2	2
	ENGL350	اللغة الانكليزية 3	2	
	CSMP351	انظمة الحاسوب والمعالجات الدقيقة	2	2
	NETP352	بروتوكولات الشبكات	2	2
	NTPG353	برمجة الشبكات	2	2
	QUEU354	مقرر اختياري	2	2
	SANN356	مقرر اختياري	3	
2025-2024 / الرابعة	PRET400	اخلاقيات المهنة	2	
	GRPR401	مشروع التخرج 1	1	2
	WMNE402	الشبكات المحمولة واللاسلكية	2	2
	NSEC403	أمنية الشبكات	3	2
	CLCP405	مقرر اختياري	2	2
	MAPP407	مقرر اختياري	3	
	ENGL450	اللغة الانكليزية 4	2	
	GRPR451	مشروع التخرج 2	1	2
	MNTN452	تكنولوجيا الشبكات الحديثة	3	
	NMGT453	ادارة الشبكات	3	2
	NWDS454	مقرر اختياري	2	2
	MULN457	مقرر اختياري	2	2

8. مخرجات التعلم المتوقعة للبرنامج
المعرفة
أ1 اساسيات التحليل الرياضي المناسبة للمساعدة في فهم و نمذجة و تحليل الشبكات أ2 تقديم اساسيات البرمجة, البرمجة شيئية المنحى و انظمة التشغيل أ3 دور تكنلوجيا المعلومات و الاتصات و العلوم الاخرى المتضمنة داخل طبقات الشبكات المختلفة أ4 اساسيات الادارة و مبادئ التصميم المتعق باجزة الشبكات و البرامج المرتبطة بها
المهارات
ب1 القدرة على استخدام الاسس العلمية و الطرق الرياضية و الحاسوب لتحليل انظمة العامة للشبكات ب2 القدرة على حل المسائل العددية باستخدام الرياضيات و الاحصاء و الحوسبة ب3 الابداع و تنظيم المهمات بشكل مرتب و فهم الحالة المعرفة المتطورة بشكل سريع في مجال الاختصاص ب4 القدرة على التخطيط و الشروع و كتابة تقرير حول مشروع معين و اعداد عرض حول ذلك
القيم
ج1 القدرة على استخدام الطرق الرياضية و الادوات التقنية و برمجة الحاسوب لحل المشاكل ج2 القدرة على استخدام الاجهزة المختبرية ذات العلاقة و الاجهزة الشبكية و تحليل النتائج بصورة حاسمة ج3 تصميم و بناء و فحص الشبكات الصغيرة و المتوسطة ج4 القدرة على البحث في الجانب المتطور من الاختصاص و تقديم العمل

9. استراتيجيات التعليم والتعلم
-من خلال المحاضرات لكن غالبا في المختبرات. تنظيم الوقت و استخدام مصادر المعلومات تكتسب من خلال المشاريع و الواجبات

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

11. الهيئة التدريسية

أعضاء هيئة التدريس

الرتبة العلمية	التخصص		المتطلبات/المهارات الخاصة (ان وجدت)		اعداد الهيئة التدريسية	
	عام	خاص			ملاك	محاضر
استاذ	هندسة الكترونيك و اتصالات	**هندسة الدوائر والمنظومات الالكترونية**			1	
استاذ	هندسة حاسوب	هندسة حاسبات واتصالات			1	
استاذ مساعد	فيزياء	كهرومغناطيسية / هوائيات شريطية			1	
استاذ مساعد	هندسة الكترونيك و اتصالات	**انظمة الطيف المنتشر**			1	
استاذ مساعد	هندسة حاسوب	**هندسة تقنية المعلومات**			1	
استاذ مساعد	لغات انكليزي	**اداب لغة انكليزية**			1	
استاذ مساعد	هندسة كهرباء	هندسة الاتصالات			1	
مدرس	هندسة معلومات	هندسة معلومات واتصالات			1	
مدرس	هندسة الكترونيك و اتصالات	شبكات لاسلكية ومتنقلة			1	
مدرس	هندسة معلومات	شبكات لاسلكية ومتنقلة			1	
مدرس	هندسة الكترونيك و اتصالات	هندسة الشبكات والاتصالات الاسلكية			1	
مدرس	هندسة كهرباء	هندسة الاتصالات			1	
مدرس مساعد	هندسة الكترونيك و اتصالات	هندسة الاتصالات والشبكات			1	
مدرس مساعد	هندسة اتصالات	تقنية اتصالات لاسلكية			1	

مدرس مساعد	هندسة كهرباء	هندسة الكترونيك واتصالات			2	
مدرس مساعد	هندسة شبكة دولية	هندسة شبكات وتقنيات الشبكة الدولية			4	
مدرس مساعد	هندسة شبكات	هندسة شبكات وتقنيات الشبكة الدولية			1	
مدرس مساعد	هندسة تقنيات الحاسوب	هندسة كهربائية وحاسبات			1	
مدرس مساعد	هندسة اتصالات	هندسة الاتصالات ومعالجة الاشارة			1	
مدرس مساعد	هندسة اتصالات و شبكات الحاسوب	هندسة الحاسبات			1	
مدرس مساعد	هندسة اتصالات الحاسوب	هندسة الاتصالات			1	
مدرس مساعد	هندسة تقنيات الحاسوب	انظمة مخبئة			1	

التطوير المهني

توجيه أعضاء هيئة التدريس الجدد

على أعضاء هيئة التدريس الجدد الالتحاق بتدريب أساليب التدريس قبل تدريس أي مقرر، وهو أمر إلزامي لجميع أعضاء هيئة التدريس لاجتياز التدريب وتأهيل التدريس. بعد ذلك، يجب أن يكونوا أعضاءً في بعض لجان القسم، ليتمكنوا من تعلم الجانب الإداري بالإضافة إلى إلقاء المحاضرات وتقديم العروض للطلاب.

التطوير المهني لأعضاء هيئة التدريس

يتمتع جميع أعضاء هيئة التدريس في كلية هندسة المعلومات بإمكانية الوصول إلى مجموعة متنوعة من برامج التطوير المهني. ويُقدم عدد من ورش العمل والندوات والمحاضرات والدورات التدريبية لتنمية المهارات، يقدمها متحدثون بارزون في مجالات متعددة.

12. معيار القبول
يُقبل الطلاب في قسم هندسة شبكات الحاسوب/كلية هندسة المعلومات وفقًا لعملية قبول مركزية قائمة على مقارنة الدرجات، تُديرها وزارة التعليم العالي والبحث العلمي/دائرة الدراسات والتخطيط والادعاء العام/دائرة القبول المركزي. يشترط للقبول في قسم هندسة شبكات الحاسوب لبرنامج البكالوريوس استيفاء الشروط الأساسية التالية: أ) يقتصر عدد الطلاب المقبولين على عدد المقاعد الدراسية التي يُقرها مجلس الكلية. ب) أن يكون المتقدم حاصلًا على شهادة الدراسة الثانوية من العراق أو ما يعادلها. ج) على المتقدم تقديم الوثائق اللازمة إلى مكتب التسجيل خلال فترة زمنية محددة (عادةً أسبوعين بعد موافقة القبول). د) على المتقدمين الذين أكملوا الدراسة الثانوية خارج العراق أن يكونوا قد أكملوا اثنتي عشرة سنة دراسية من المرحلة الابتدائية والثانوية في مؤسسة تعليمية معتمدة. كما يجب عليه تقديم شهادة معادلة صادرة عن وزارة التربية والتعليم العراقية.

13. أهم مصادر المعلومات عن البرنامج
https://coie-nahrain.edu.iq/ar/

14. خطة تطوير البرنامج

مخطط مهارات البرنامج

السنة / المستوى	رمز المقرر	اسم المقرر	اساسي أم اختياري	مخرجات التعلم المطلوبة من البرنامج											
				المعرفة				المهارات				القيم			
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4
2025-2024 المرحلة الاولى	**ENLA130**	اللغة الانكليزية 1	اساسي					*	*	*	*	*	*	*	*
	CALC101	تفاضل وتكامل 1	اساسي					*	*	*	*				
	PHYS102	الفيزياء	اساسي												
	BIOL103	بايولوجي	اساسي					*	*	*	*				
	ITFN104	اساسيات تكنولوجيا المعلومات	اساسي	*	*	*	*	*	*	*	*				
	EDAC105	الرسم الهندسى والتصميم بالحاسوب	اساسي												
	HURI110	حقوق الانسان	اساسي									*	*	*	*
	ARLA120	اللغة العربية	اساسي					*	*	*	*	*	*	*	*
	CALC150	تفاضل وتكامل 2	اساسي					*	*	*	*				
	CFPR151	اساسيات الحاسوب والبرمجة	اساسي	*	*	*	*	*	*	*	*				

	LODS152	التصميم المنطقي	اساسي				*	*	*	*								
	ELCA153	تحليل الدوائر الكهربائية	اساسي				*	*	*	*								
	FNET154	اساسيات الشبكات	اساسي	*	*	*					*	*						
2025-2024 المرحلة الثانية	**ENGL200**	اللغة الانكليزية 2	اساسي				*	*	*	*	*	*	*	*	*	*	*	*
	EGMM201	رياضيات هندسية 1	اساسي				*	*	*	*	*							
	PBST202	احتمالية واحصاء	اساسي				*	*	*	*	*							
	ELPH203	القيزياء الالكترونية	اساسي				*	*	*	*	*							
	OOPJ204	البرمجة الشيئية الموجهة- جافا	اساسي	*	*	*	*	*	*	*	*							
	WEBP205	برمجة الوب	اختياري	*	*	*												
	PRMG255	مقرر اختياري	اساسي				*	*	*	*	*	*	*	*	*	*	*	*
	EGMM251	رياضيات هندسية 2	اساسي				*	*	*	*	*							
	SGAN252	تحليل الاشارات	اساسي				*	*	*	*	*							
	DSDD253	تصميم النظم الرقمية	اساسي				*	*	*	*	*							
	INCO254	نظرية المعلومات والترميز	اساسي				*	*	*	*	*							
	DDBB259	قواعد بيانات	اختياري	*	*	*												

2025-2024 المرحلة الثالثة	**DEMO300**	ديمقراطية	اساسي						*	*	*	*	*	*	*	*	*	*
	NUMD301	الطرق العددية	اساسي						*	*	*	*						
	CNET302	شبكات حاسوب	اساسي	*	*	*	*	*	*	*	*	*	*					
	COMM303	اتصالات البيانات	اساسي	*	*	*	*	*	*	*	*	*	*					
	OSYS304	مقرر اختياري	اختياري	*	*	*	*	*	*	*	*	*	*					
	AINT307	مقرر اختياري	اختياري	*	*	*	*	*										
	ENGL350	اللغة الانكليزية 3	اساسي						*	*	*	*	*	*	*	*	*	*
	CSMP351	انظمة الحاسوب والمعالجات الدقيقة	اساسي	*	*	*	*	*	*	*	*	*	*					
	NETP352	بروتوكولات الشبكات	اساسي	*	*	*	*	*	*	*	*	*	*					
	NTPG353	برمجة الشبكات	اساسي	*	*	*	*	*	*	*	*	*	*					
	QUEU354	مقرر اختياري	اختياري	*	*	*	*	*	*	*	*	*	*					
	SANN356	مقرر اختياري	اختياري	*	*	*	*	*										
2025-2024 المرحلة الرابعة	**PRET400**	اخلاقيات المهنة	اساسي						*	*	*	*	*	*	*	*	*	*
	GRPR401	مشروع التخرج 1	اساسي	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	WMNE402	الشبكات المحمولة واللاسلكية	اساسي	*	*	*	*	*	*	*	*	*	*					
	NSEC403	أمنية الشبكات	اساسي	*	*	*	*	*	*	*	*	*	*					

	CLCP405	مقرر اختياري	اختياري	*					*	*	*	*						
	MAPP407	مقرر اختياري	اختياري															
	ENGL450	اللغة الانكليزية 4	اساسي					*	*	*	*	*				*	*	*
	GRPR451	مشروع التخرج 2	اساسي	*				*	*	*	*	*				*	*	*
	MNTN452	تكنولوجيا الشبكات الحديثة	اساسي	*				*	*	*	*	*						
	NMGT453	ادارة الشبكات	اساسي	*				*	*	*	*	*						
	NWDS454	مقرر اختياري	اختياري	*				*	*	*	*	*						
	MULN457	مقرر اختياري	اختياري	*				*	*	*	*	*						

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

وصف المقررات للمرحلة الاولى

1.	Course Name:
	اللغة الانكليزية 1
2.	Course Code:
	ENLA130
3.	Semester / Year:
	1st Semester / First Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	2/2
7.	Course administrator's name (mention all, if more than one name)
	Name: Asst. Prof. Dr. Raghad Shakir Email: Raghad_Shakir@nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	• **know students with essential information in the English language in association with reading, writing and speaking skills, and knowing more English vocabulary.** • **To understand pronouns, questions and short answers, tenses (present, past and future), adjective, adverb, prepositions of place, punctuation marks and practicing writing.** • **This module works towards enhancing students' English language competencies along with their technical or professional knowledge.**

	• **Enhance students' communication skills in English can result in better job opportunities in the future**

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1	Introduction	Theory	
2	2	A1	The sentence: What is a sentence and what is not a sentence.	Theory	Quiz1
3	2	A1	Parts of a sentence: subject; types of subjects	Theory	
4	2	A1	Parts of a sentence: verb; types of verbs: verb to be – ordinary verbs – modal Verbs	Theory	Test 1
5	2	A1	Types of verbs 2	Theory	Quiz2
6	2	A1	Tenses: Present v. Past	Theory	
7	2	A1	The first exam	Theory	Test 2
8	2	A1	Parts of a sentence, the complement.	Theory	
9	2	A1	Types of a sentence; simple sentence	Theory	
10	2	A1	Types of a sentence; complex sentence	Theory	
11	2	A1	Compound sentences	Theory	
12	2	A1	Practicing writing	Theory	Report
13	2	A1	The second exam	Theory	
14	2	A1	Practicing writing	Theory	Seminar
15	2	A1	Practicing writing	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Keith Boecker, P. Charles Brown, Oxford English for Computing, Oxford University press. -Prentice Hall, Writing &Practice Communication in Action, Pearson, Prentice Hall.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Longmann Preparation Course of the TOEFL test .the paper test
Electronic References, Websites	http://www.english for every one.com

1. Course Name:
تفاضل و تكامل 1
2. Course Code:
CALC101
3. Semester / Year:
1st Semester / First Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )												رقم الأسبوع ( )
												اسم المادة
												عدد الساعات
												اسم التدريسي + التوقيع+ التاريخ
												اسم الطالب

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Lect. Dr. Dhuha Hussien Hameed Email: Dhuha_Hussien@nahrainuniv.edu.iq
8. Course Objectives

Course Objectives	**To understand the concept of rate of change**	**1-**

	To Develop the derivative idea from rate of change **2-** **To perform derivative to different functions** **3-** **To deal with integration basics** **4-**

9. Teaching and Learning Strategies

Strategy	**Weekly lectures with tutorial session ensure better understanding** **Quizzes and exams to ensure student learning**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**The Rate of Change of Function I:** Coordinates for the plane, Increments and distance, The slope of a straight line, Equation of a straight line.	Theory	
2	4	A1	**The Rate of Change of Function II:** Functions and graphs, Slopes of quadratic and cubic curves, the slope of the curves y=f(x), Derivatives, Velocity and other rates of change.	Theory	Quiz1
3	4	A1	**The Rate of Change of Function III:** Properties of limits, Infinity as a limit, Continuous functions,	Theory	
4	4	A1	**Derivatives I:** Formal differentiation, Polynomial functions and their derivatives, Products, power, and quotients.	Theory	Test 1
5	4	A1	**Derivatives II**: Implicit differentiation and fractional powers, Tangent line approximation, The chain rule and parametric equations, A brief review of trigonometry, Angles between curves.	Theory	Quiz2
6	4	A1	**Derivatives III:** Derivatives of trigonometric functions, Newton's method for approximating solutions of equations, Inverse functions and the Picard method.	Theory	
7	4	A1	**Applications of Derivatives I:** Curves sketching, The sign of the first derivatives, Concavity and points, Asymptotes and symmetry, Maxima and minima theorems.	Theory	Test 2
8	4	A1	**Applications of Derivatives II:** Related rates, Rolle's theorem, the mean value theorem, Indeterminate forms and l'Hopital rules, Extending the Mean Value Theorem to Taylor's formula.	Theory	
9	4	A1	**Integration I:** Indefinite integrals, Applications, Determining constants of integration, Integrals of trigonometric functions.	Theory	

10	4	A1	**Integration II:** Definite integrals, Area under a curve, Calculating areas as limits, The fundamental theorems of integral calculus.	Theory	
11	4	A1	**Integration III:** Integration by substitution Differentials, Rules for approximating definite integrals.	Theory	
12	4	A1	**Applications of Definite Integrals I:** Area between two curves, Distance, Calculating volumes by slicing.	Theory	Project
13	4	A1	**Applications of Definite Integrals II:** Length of plane curve, Area of a surface of revolution, Average value of a function.	Theory	
14	4	A1	**Tr Transcendental Functions I:** The inverse of trigonometric functions, Derivatives of the inverse trigonometric functions, The natural logarithm and its derivatives.	Theory	Seminar
15	4	A1	**Transcendental Functions II:** Properties of natural logarithm, The exponential function e^x, The function a^x and a^u, The function $y=\log_q u$.	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Thomas and Finney, Calculus and Analytic Geometry, Pearson Education Inc,11th Ed, 2008
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:

الفيزياء

2. Course Code:

PHYS102

3. Semester / Year:

1st Semester / First Year

4. Description Preparation Date:

5-5-2025

5. Available Attendance Forms:

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

4/3

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

Name: Lect. Dr. Ali Abdulhadi Jasim
Email: Jasim@nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	**1- To provide the students the mathematics representation of Vectors and their physical representation.** **2-To understand oscillation motion and waves motion, including electromagnetic waves and sound Waves.** **3-To give the basic concepts of Physical Optics** **4-To recognize physics and mathematics Interference and diffraction.** **5-To identify physics of nature of light and interaction of wave with matter.** **6-Understanding capeadors, resistors and inductors.**

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Vectors : Vectors and scalars, Component of Vectors , Vector Arithmetic	Theory+Lab	

2	4	A1	Force and Motion – I: Newtonian Mechanics, Newton's First Law, Force, Mass, Newton's second Law, Some Particular Forces, Applying Newton's Laws	Theory+Lab	Quiz1
3	4	A1	Force and Motion – II: Friction, Properties of Friction, The Drag Force and Terminal Speed, Uniform Circular Motion.	Theory+Lab	
4	4	A1	Kinetic Energy and Work: What is Energy? , Kinetic Energy, Work, Work and Kinetic Energy, Work Done by the Gravitational Force, Work Done by a Spring Force.	Theory+Lab	Test 1
5	4	A1	Oscillations: Simple Harmonic Motion, The Force Law for Simple Harmonic Motion, Energy in Simple Harmonic Motion, Pendulums, Damped Simple Harmonic Motion	Theory+Lab	Quiz2
6	4	A1	Waves – I: Types of waves, Transverse And Longitudinal waves, Wavelength and Frequency, The Speed of Traveling wave, The wave Equation, The Principle of Superposition For waves, Interference of waves	Theory+Lab	
7	4	A1	Waves – II : Sound waves, The Speed of Sound, Traveling Sound Waves, Intensity and Sound level, The Doppler Effect, Supersonic Speed, Shock Waves	Theory+Lab	Test 2
8	4	A1	Electric Potential: Electric charges and electric fields, Conductors and Insulators, Coulomb's law, The Electric Field Due to a Point Charge, The Electric Field Due to a Charged Disk	Theory+Lab	
9	4	A1	Capacitance: Calculating the Capacitance, Capacitors in Parallel and in Series, Energy Stored in an Electric Field, Capacitor with a Dielectric, Dielectrics: An Atomic View	Theory+Lab	
10	4	A1	Current and Resistance: Direct current circuits: Electric Current, Current Density, Resistance and Resistivity, Ohms Law, Power in Electric Circuits	Theory+Lab	
11	4	A1	Circuits: work ,energy , EMF, The Ammeter and The Voltmeter, RC Circuits	Theory+Lab	
12	4	A1	Magnetic Fields: What Produces a Magnetic Field?, Crossed Fields: Discovery of the Electron, source of magnetic fields; and Faraday's law	Theory+Lab	Project
13	4	A1	Magnetic Fields Due to Currents: Calculating Magnetic Fields due to a Current, Force Between two parallel currents, Amperes law	Theory+Lab	
14	4	A1	Induction and Inductance: Faraday's Law of Induction, Lenz's law, Inductors and Inductance, Self-Induction. Mutual Induction	Theory+Lab	Seminar
15	4	A1	Review	Theory+Lab	

11. Course Evaluation	
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Fundamentals of Physics Extended, 9th edition, Halliday and Resnick, John Wiley & Sons, 2011
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1.	Course Name:
	الاحياء
2.	Course Code:
	BIOL103
3.	Semester / Year:
	1st Semester / First Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	4/3
7.	Course administrator's name (mention all, if more than one name)
	Name: Assist. Lect. Munqith Alwan Email: munqith.alwan@nahrainuniv.edu.iq
8.	Course Objectives
Course Objectives	**1-To understand life, chemistry and water continued: biological molecules,** **2-To recognize cells and membranes** **3-To identify Energy, Enzymes and Biological reactions, cellular respiration, photosynthesis** **4-To understand cell division: mitosis and miosis: Mendel, Genes and inheritance, genes, chromosomes and human genetics** **5-To understand DNA structure, Replication and Organization. From DNA to protein Biotechnology and cell processes and transport (Passive and active)**
9.	Teaching and Learning Strategies
Strategy	**The main strategy will be adopt in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their thinking skills. This will be achieve through classes,**

	interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	A1	Introduction to Biology concepts: Life, Chemistry and water	Theory	
2	3	A1	Life, Chemistry and water continued: Biological Molecules	Theory	Quiz1
3	3	A1	Biological Molecules: Cells and Membranes	Theory	
4	3	A1	Cells and Membranes: Energy, Enzymes and Biological reactions	Theory	Test 1
5	3	A1	Energy, Enzymes and Biological reactions continued	Theory	Quiz2
6	3	A1	Cellular respiration	Theory	
7	3	A1	Photosynthesis	Theory	Test 2
8	3	A1	Cell division: Mitosis and Miosis: Mendel, Genes and inheritance	Theory	
9	3	A1	Cell division: Mitosis and Miosis: Mendel, Genes and inheritance	Theory	
10	3	A1	Genes, chromosomes and Human Genetics	Theory	
11	3	A1	DNA structure, Replication and Organization	Theory	
12	3	A1	From DNA to protein Biotechnology	Theory	Project
13	3	A1	Cell processes I- Transport (Passive and active)	Theory	
14	3	A1	Cell processes II- Metabolism (metabolic pathways & enzymes)	Theory	Seminar
15	3	A1	Cell processes III-Cellular respiration	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Biology: The Dynamic Science, By Peter J. Russell, Paul E. Hertz, Beverly McMillan Cengage Learning, 2011
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1.	Course Name:
	اساسيات الحاسوب
2.	Course Code:
	ITFN104
3.	Semester / Year:
	1st Semester / First Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)	
	4/3	
7.	Course administrator's name (mention all, if more than one name)	
	Name: Prof. Dr. Ammar Abdulmalek Email: Ammar_Abdulmalek@nahrainuniv.edu.iq	
8.	Course Objectives	
	Course Objectives	**1. To Learn and have basic knowledge about information technology roles and duties.** **2. To Understand how Computer works and its components** **3. To learn and have solid understanding about OSes and how they work with Computers.** **4. Understand database management systems and web technology.** **5. Have a solid understanding about how WWW web works.** **6. Student will have understanding about networking fundamentals, IP and protocols.** **7. To have and understand what is encryption and decryption and how computer security works.**
9.	Teaching and Learning Strategies	

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**IT roles:** System administrator, Network administrator, web administrator, Database administrator, security administrator. Skills for the Successful IT Person	Theory+Lab	
2	4	A1	**Parts of a PC**, system units and the parts inside, motherboard, microprocessor Chips, power supplies, expansion slots and cards	Theory+Lab	Quiz1
3	4	A1	**Memory function**, measure memory size, address bus, RAM and ROM, cache memory, **I/O Devices:** keyboard, mouse, microphone, scanners, digital cameras, video cards, monitor, and speakers	Theory+Lab	
4	4	A1	Storage systems: Hard Disks, CD drives and DVD drives	Theory+Lab	Test 1
5	4	A1	**Principles of operating systems:** Kernel, Device drivers, Shell, Utility programs, Interrupts, Process Management and Scheduling, Memory Management,	Theory+Lab	Quiz2
6	4	A1	**Principles of operating systems:** Virtual Memory: Paging and Page Tables, Resource Management, Deadlock, Other OS Tasks: Booting	Theory+Lab	
7	4	A1	**Networks-I:** A simple point-to-point connection, **Data:** Analog vs. Digital, Formatted Documents, Connection media – Examples, what is bandwidth? **Multiplexing:** Squeezing many channels into one, Why build networks?	Theory+Lab	Test 2
8	4	A1	**Networks-II:** Network protocols-Example: TCPIP protocol architecture.	Theory+Lab	
9	4	A1	**Programming Languages:** Types of software: System software, Application software, Programming languages: Machine, assembly, High-level and Fourth-generation" language.	Theory+Lab	
10	4	A1	**Relational Databases**: What is a database? What is a database management system? An Introduction to Microsoft Access,	Theory+Lab	

11	4	A1	**Web Technologies:** How the original Web works, Anatomy of a URL, How the Web works, WWW is a Client/Server System, web forms, CGI, FedEx, Microsoft Active Server Pages ASP), Cookies, Cookie Applications, how does Google work? Cloud-Introduction.	Theory+Lab	
12	4	A1	**Computer Security:** What is computer security? Securing communications: Encryption, Authentication, Integrity, Traditional cryptography, Ceasar's Cipher: Encryption by Substitution.	Theory+Lab	Project
13	4	A1	**IT roles:** System administrator, Network administrator, web administrator, Database administrator, security administrator. Skills for the Successful IT Person	Theory+Lab	
14	4	A1	**Parts of a PC**, system units and the parts inside, motherboard, microprocessor Chips, power supplies, expansion slots and cards	Theory+Lab	Seminar
15	4	A1	**Memory function**, measure memory size, address bus, RAM and ROM, cache memory, **I/O Devices:** keyboard, mouse, microphone, scanners, digital cameras, video cards, monitor, and speakers	Theory+Lab	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Book#1: White, Ron, et. al. How Computers Work. 7th ed. Indianapolis, IN: Que Publishing. ISBN: 0789730332. Book#2: Gralla, Preston, et. al. How the Internet Works. 7th ed. Indianapolis, IN: Que Publishing. ISBN: 0789729733. Book#3: Viescas, John L. Running Microsoft® Access 2000. Redmond, WA: Microsoft® Press, 1999. ISBN: 1572319348. Book#4: Comer, Douglas E. Chapter 24 in The Internet Book. 3rd ed. Upper Saddle River, NJ: Prentice Hall, 2000. pp. 223-242. ISBN: 0130308528.
Main references (sources)	Zimmerman, Phil. Chapter 1 in An Introduction to Cryptography.Reference#2: https://www.webopedia.com/
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1.	Course Name:
	الرسم الهندسة– كاد
2.	Course Code:
	EDAC105
3.	Semester / Year:
	1st Semester / First Year
4.	Description Preparation Date:
	5–5–2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )												رقم الأسبوع ( )
												اسم المادة
												عدد الساعات
												اسم التدريسي + التوقيع+ التاريخ
												اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	4/3
7.	Course administrator's name (mention all, if more than one name)
	Name: Lect. Dr. Donya Abbas Email: Donya_abbas@nahrainuniv.edu.iq
8.	Course Objectives
Course Objectives	**The main strategy that will be adopted in delivering this module is to encourage students' participation in lecture discussions and lab sessions, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.**
9.	Teaching and Learning Strategies
Strategy	**The main strategy that will be adopted in delivering this module is to encourage students' participation in lecture discussions and lab sessions, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Basic Principles of Engineering Drawings**: (Explanation of engineering tools, lines styles & types & Shapes drawing)	Theory+Lab	
2	4	A1	**Engineering Operations:** Dimensioning, Scale, Explanation of (Arch, Circle, Ellipse) drawings	Theory+Lab	Quiz1
3	4	A1	**Exercises on Engineering Operations**	Theory+Lab	
4	4	A1	**Projections:** Multiview projections (Top projection, Front projection & Side Projection)	Theory+Lab	Test 1
5	4	A1	**Exercises on Projections**	Theory+Lab	Quiz2
6	4	A1	**A-Introduction to AutoCAD**: History, Setting the Workspace, Keyboard Input, Working with Files, Displaying Objects. **B-Creating Basic Drawings:** Commands Using Object Snaps, Using Polar Tracking and Polar Snap, Using Object Snap Tracking, Working with Units, Using Function Key	Theory+Lab	
7	4	A1	**A-Manipulating Objects:** Object Selection Commands (copy, mirror, rotate, array) **B-Modifying Tools:** Trimming and Extending Objects, Offsetting Objects, Joining Objects, Break Objects Stretching Objects	Theory+Lab	Test 2
8	4	A1	**A-Layer Management & Inquiry:** Using Layers, Layer Tools, Organizing Objects with Layers, Using Inquiry Commands **B-Working with Layouts & Viewpoints:** Using Layouts, creating layouts, Using Viewports, Plotting Drawings	Theory+Lab	
9	4	A1	**A-Annotating the Drawing:** Creating Multiline Text, Creating Single Line Text, Using & editing Text Styles **B-Dimensioning:** Creating Dimensions, Using Dimension Styles, Editing Dimensions	Theory+Lab	
10	4	A1	**A-Hatching Objects:** Hatching Objects, Editing Hatch Objects **B-Working with Reusable Content:** Using Blocks, Working with Design Center, Using Tool Palettes **C-Creating Additional Drawing Objects:** Tables	Theory+Lab	

11. Course Evaluation

	Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1-كتاب الرسم الهندسي (عبد الرسول الخفاف) 2- Introducing AutoCAD 2008, Wiley, 2010 3- Technical Drawing 101 with AutoCAD 2017 4- Tutorial Guide to AutoCAD 2018
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
حقوق الانسان
2. Course Code:
HURI110
3. Semester / Year:
2nd Semester / First Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)
2/2
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Prof. Dr. Jabbar Ismael Email: Jabbar_ismael@nahrainuniv.edu.iq
8. Course Objectives

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

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1	حقوق الانسان في الحضارات القديمة	Theory	
2	2	A1	حقوق الانسان في الشرائع والاديان السماوية/ حقوق الانسان في الديانتين المسيحية واليهودية	Theory	Quiz1
3	2	A1	حقوق الانسان في الاسلام	Theory	
4	2	A1	مصادر حقوق الانسان/ المصادر الدولية	Theory	Test 1
5	2	A1	المصادر الوطنية	Theory	Quiz2
6	2	A1	ضمانات حقوق الانسان / ضمانات حقوق الانسان على الصعيد الداخلي	Theory	
7	2	A1	=	Theory	Test 2
8	2	A1	ضمانات حقوق الانسان على الصعيد الدولي	Theory	
9	2	A1	=	Theory	
10	2	A1	**العولمة وحقوق الانسان**	Theory	
11	2	A1	=	Theory	
12	2	A1	**واجبات الحاكم الاسلامي**	Theory	Report
13	2	A1	=	Theory	
14	2	A1	**جرائم الابادة الجماعية**	Theory	Seminar
15	2	A1	**السيرة النبويةالشريفة**	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	حقوق الانسان والطفل والديمقراطية المؤلف: أ. د. ماهر صالح علاوي الجبوري واخرون الناشر وسنة الطبع: وزارة التعليم العالي والبحث العلمي– جامعة تكريت، 2009
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1.	Course Name:
	اللغة العربية
2.	Course Code:
	ARLA150
3.	Semester / Year:
	2nd Semester / First Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

رقم الأسبوع ( )	استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											
اسم المادة												
عدد الساعات												
اسم التدريسي + التوقيع+ التاريخ												
اسم الطالب												

6.	Number of Credit Hours (Total) / Number of Units (Total)
	2/2
7.	Course administrator's name (mention all, if more than one name)
	Name: Asst. Prof. Dr. Asmaa Abd Own Email: Jabbar_ismael@nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	**تتلخص اهداف مادة اللغة العربية بما يلي:** **1- للالمام بالقواعد الرئيسية للغة العربية** **2- للتعرف على المبتدأ وانواعه ، الخبر وانواعه، نواسخ الابتداء ، كان واخواتها، ان واخواتها الجملة الاسمية** **3- لاستعراض المثنى والملحق به، جمع المذكر السالم والملحق به جمع المؤنث السالم، الاسماء الخمسة** **4- الالمام بالجملة الفعلية بناء الفعل الماضي، بناء فعل الامر و الفعل المضارع، بناؤه واعرابه .** **5- التعمق بالاسماء المنصوبه، المفعول به، المفعول المطلق، المغعول فيه، المفعول معه ومعاني حروف الجر** **6- التعرف والمراجعة للشعراء محمد مهدي الجواهري- معروف الرصافي- احمد مطر** **7- لمراجعة القرآن الكريم / سورة الحجرات** **8- لكيفية كتابة الهمزة المتوسطة والمتطرفة كتابة الضاد والظاء، كتابة التاء القصيرة والطويلة علامات الترقيم الاخطاء الشائعة في المكاتبات الرسمية ، كتابة العدد**

9. Teaching and Learning Strategies

Strategy	**1-**محاضرات نظرية وواجبات ومناقشات وامتحانات **2-**ارشاد الطلبة الى بعض المواقع الكترونية لتطوير قابلياتهم ومهاراتهم.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1	الجملة الاسمية	Theory	
2	2	A1	المبتدأ وانواعه ، الخبر وانواعه، نواسخ الابتداء ، كان واخواتها، ان واخواتها	Theory	Quiz1
3	2	A1	المثنى والملحق به، جمع المذكر السالم والملحق به	Theory	
4	2	A1	جمع المؤنث السالم، الاسماء الخمسة	Theory	Test 1
5	2	A1	الجملة الفعلية	Theory	Quiz2
6	2	A1	بناء الفعل الماضي، بناء فعل الامر	Theory	
7	2	A1	الفعل المضارع، بناؤه واعرابه،	Theory	Test 2
8	2	A1	الاسماء المنصوبه، المفعول به، المفعول المطلق، المغعول فيه، المفعول معه	Theory	
9	2	A1	معاني حروف الجر	Theory	
10	2	A1	الشعر	Theory	
11	2	A1	محمد مهدي الجواهري	Theory	
12	2	A1	الشعر: معروف الرصافي	Theory	Report
13	2	A1	القرآن الكريم	Theory	
14	2	A1	سورة الحجرات	Theory	Seminar
15	2	A1	الاملاء	Theory	

11. Course Evaluation	
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Lectures in Arabic Language
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1.	Course Name:
	تفاضل و تكامل 2
2.	Course Code:
	CALC151
3.	Semester / Year:
	2nd Semester / First Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	4/3
7.	Course administrator's name (mention all, if more than one name)
	Name: Assist. Prog. Dr. Hind Subhi Hussien Email: Hind_Subhi@nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	**1-To understand complex numbers and basic operation over them.** **2-To deal with basic mathematics concepts.** **3-To use learned topics in solving electrical circuit analysis problem.** **4-To Develop the knowledge about matrices and basic operation over them.** **5-To perform calculation of convergence value of infinite series.**

9.	Teaching and Learning Strategies

Strategy	**Weekly lectures and tutorial session to ensure better understanding** **Quizzes and exams to ensure student learning**

10.	Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Complex Numbers and Functions I	Theory	
2	4	A1	Complex Numbers and Their Geometric Representation, Polar Form, Powers and Roots, Polar coordinates, Graphs of polar equations, Polar equations of conics and other functions, Integrals.	Theory	Quiz1
3	4	A1	Complex Numbers and Functions II	Theory	
4	4	A1	Derivative of Complex Function, Exponential Function, Trigonometric and Hyperbolic Functions. Euler's Formula.	Theory	Test 1
5	4	A1	Complex Numbers and Functions III	Theory	Quiz2
6	4	A1	Line Integral in the Complex Plane, Cauchy's Integral Theorem, Cauchy's Integral Formula	Theory	
7	4	A1	Matrices and Linear Transformation I	Theory	Test 2
8	4	A1	Matrices, Vectors: Addition and Scalar Multiplication, Matrix Multiplication, Symmetric, Skew-Symmetric, and Orthogonal Matrices.	Theory	
9	4	A1	Matrices and Linear Transformation II	Theory	
10	4	A1	Linear Systems of Equations. Gauss Elimination, Linear Independence. Rank of a Matrix, Vector Space	Theory	
11	4	A1	Matrices and Linear Transformation III	Theory	
12	4	A1	Solutions of Linear Systems, Existence, Uniqueness, Determinants, Cramer's Rule, Inverse of a Matrix, Gauss–Jordan Elimination	Theory	Project
13	4	A1	Integration Methods I	Theory	
14	4	A1	Basic integration formulas, Integration by parts, Products and powers of trigonometric functions, Even powers of sines and cosines.	Theory	Seminar
15	4	A1	Integration Methods II	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Thomas and Finney, Calculus and Analytic Geometry, Pearson Education Inc,11th Ed, 2008
Main references (sources)	win Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons Inc, 10th Ed. 2011.
Recommended books and references (scientific journals, reports…)	

Electronic References, Websites	

1.	Course Name:
	برمجة الحاسوب
2.	Course Code:
	CFPR151
3.	Semester / Year:
	2nd Semester / First Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	4/3
7.	Course administrator's name (mention all, if more than one name)
	Name: Assist. Prof. Dr. Lahieb Mohammed Jawad Email: lahieb_Mohammed@nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	**1. Able to perform the conversion among different number systems.** **2. Familiar with basic logic gates (AND, OR, NOT, XOR and XNOR).** **3. Able to simplify simple Boolean functions by using the basic Boolean properties.** **4. Able to design simple combinational logic using basic gates.** **5. Able to optimize simple logic using Karnaugh maps, understand "don't care".** **6. Familiar with basic combinational circuits like Adders, Comparators, decoder, BCD-to seven segment decoder, encoder, multiplexer and Demultiplexer.**

	7. Familiar with basic sequential logic components (S–R, J–K, D and T) Flip–Flop and their usage. 8. Familiar with basic sequential circuits like Register, Counters and Memory. 9. Able to understand and use high–level hardware description languages (VHDL and Verilog) to design combinational or sequential circuits.

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Brief History of Computers, Basic Components, CPU, I/O &Peripheral Devices, Number Systems, Data Representation	Theory+Lab	
2	4	A1	Overview of Computer Architecture, Computer Architecture, Computer Organization, computer system, Stored Program concept, Von Neumann Machine Architecture	Theory+Lab	Quiz1
3	4	A1	Computer System, Computer Components, Function of Control unit, System buses, Instruction cycle. Memory System, Characteristic of memory, Types of Memories: primary, secondary and cache memory	Theory+Lab	
4	4	A1	The language of computer, programming methodology: structural programming, OOP, ANSI/ISO standard C++.	Theory+Lab	Test 1
5,6,7	4	A1	Algorithms: Algorithm design &Flow Charts. Case study.	Theory+Lab	Quiz2
8	4	A1	Source, Object & exe codes. The Basic Structure of program,	Theory+Lab	
9	4	A1	Using I/O statements, Variables, Operators, Loops: for, while, do while loop.	Theory+Lab	Test 2

10	4	A1	Decisions: if statement, if-else statement, else-if construct, switch statement, Conditional operator	Theory+Lab	
11,12	4	A1	Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array – Calculating the length of the Array – Operations on Array – one dimensional array for inter-function communication – Two dimensional Arrays –Operations on Two Dimensional Arrays	Theory+Lab	
13	4	A1	Functions: Simple Functions, Functions that return a value, using arguments to pass data to a function, using more than one functions, External variables, Preprocessor directives. Strings: Introduction String and Character functions	Theory+Lab	
14	4	A1	Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Pointer Expressions and Pointer Arithmetic – Null Pointers – Generic Pointers - Passing Arguments to Functions using Pointer – Pointer and Arrays – Passing Array to Function.	Theory+Lab	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Book#1: William Stallings,** Computer organization and architecture designing for performance, Prentice Hall, 2010. **Book#1: D. S.,** C+ + Programming: From problem analysis to program design, 2nd Edition, Thomson 2004
Main references (sources)	**Reference#1 Paul Deitel and Harvey Deitel**, 'C++ How to program', 8th Edition, Prentice Hall **Reference#2 Bjarne Stroustrup** The C+ + Programming Language, 3rd Edition, by AT&T 1997.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:

تصميم المنطقي

2. Course Code:

LODS152

3. Semester / Year:

2nd Semester / First Year

4. Description Preparation Date:

5-5-2025

5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

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

4/3

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

Name: Assist. Lect. Noor Natiq
Email: Noor_Natiq@nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	**1. Able to perform the conversion among different number systems.** **2. Familiar with basic logic gates (AND, OR, NOT, XOR and XNOR).** **3. Able to simplify simple Boolean functions by using the basic Boolean properties.** **4. Able to design simple combinational logic using basic gates.** **5. Able to optimize simple logic using Karnaugh maps, understand "don't care".** **6. Familiar with basic combinational circuits like Adders, Comparators, decoder, BCD-to seven segment decoder, encoder, multiplexer and Demultiplexer.** **7. Familiar with basic sequential logic components (S-R, J-K, D and T) Flip-Flop and their usage.** **8. Familiar with basic sequential circuits like Register, Counters and Memory.** **9. Able to understand and use high-level hardware description languages (VHDL and Verilog) to design combinational or sequential circuits.**

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Digital systems:** Decimal, binary, octal, hexadecimal number, number	Theory + lab	
2	4	A1	**Boolean algebra and logic gates**, Basic definitions of Boolean algebra, Boolean function, digital logic gate.	Theory + lab	Quiz1
3	4	A1	**Get-level minimization:** Canonical and standard forms, Simplification of Boolean functions	Theory + lab	
4	4	A1	Algebra manipulation, Karnaugh maps simplification (2 to 5) variable maps,	Theory + lab	Test 1
5	4	A1	Product of sum simplification, NAND and NOR implementation, don't care conditions	Theory + lab	Quiz2
6	4	A1	**Representation of signed numbers**: r's complement, (r-1)'s complement, Two's complement adder-subtractor, binary codes, code conversion, analysis procedure of code conversion	Theory + lab	
7	4	A1	**Design of digital devices:** Decoder, BCD-to seven segment decoder	Theory + lab	Test 2
8	4	A1	Encoder, priority encoder	Theory + lab	
9	4	A1	**Multiplexer:** design of (1-4) multiplexer, design of (1-8) multiplexer	Theory + lab	
10	4	A1	**Demultiplexer:** design of (1-4) demultiplexer, and (1-8) Demultiplexer,	Theory + lab	
11	4	A1	**Latches and Flip-Flops:** Flip-Flop types: S-R, D, J-K, T, Introduction to Registers, RAM, ROM, PROM, EPROM, and EEPROM,	Theory + lab	
12	4	A1	**Synchronous sequential logic:** Analysis of clocked sequential circuits, Derivation of state graphs and tables, reduction of state tables	Theory + lab	Project
13	4	A1	**Synchronous sequential logic:** Sequential circuit design, Shift Registers and Counters	Theory + lab	
14	4	A1	**Asynchronous sequential circuits:** Analysis procedure, circuit with latches, design procedure.	Theory + lab	Seminar
15	4	A1	**Introduction to VHDL**	Theory + lab	

11. Course Evaluation	
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Book#1: M. Morris Mano,** "Digital Design"**,** Prentice Hall, 3rd edition, 2016
Main references (sources)	**Reference#1: M. Morris Mano, Michael D. Ciletti,** "Digital Design: With an Introduction to the Verilog HDL"**,** Prentice Hall, 5th edition, 2013 **Reference#2: Roth,"** Fundamentals of Logic Design", Thomson, 5th Edition, 2004
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
تحليل الدوائر الكهربائية
2. Course Code:
ELCA153
3. Semester / Year:
2nd Semester / First Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Lect. Dr. Kalid Waleed Hameed Email: KWH_SaT@nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	**1. Understand basic DC circuit technology.** **2. Analyze circuits with methods of analysis and star–delta transformation.** **3. Application of Network Theorems in DC circuits.** **4. Understand basic AC circuit technology.** **5. Apply circuit analysis methods and theorems in AC and R, L, and C circuits.** **6. Calculate and discriminate various power types.**

9. Teaching and Learning Strategies

Strategy	**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.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Fundamentals of DC circuits: current, voltage, circuit components, conductors & insulators, semiconductors.	Theory + lab	
2	4	A1	Fundamentals of DC circuits: Ohms law , dc power, energy, efficiency.	Theory + lab	Quiz1
3	4	A1	Series Circuits: Kirchhoff's voltage law, voltage divider rule, voltage regulation.	Theory + lab	
4	4	A1	Parallel Circuits: Kirchhoff's current law, current divider rule, power distribution.	Theory + lab	Test 1
5	4	A1	Network Theorems: Thevenin's theorem, Norton's theorem, maximum power transfer, applications.	Theory + lab	Quiz2
6	4	A1	Methods of Analysis: Branch Current analysis, Mesh analysis, Y & Δ conversion.	Theory + lab	
7	4	A1	AC fundamentals: definitions, sinusoidal waveform, phase relation, peak values, rms value & average values.	Theory + lab	Test 2
8	4	A1	The Basic Elements and Phasors: Response of inductors & capacitors in ac circuits, average power & P.F.	Theory + lab	

9	4	A1	The Basic Elements and Phasors: complex numbers, polar & rectangular forms.	Theory + lab	
10	4	A1	Series and Parallel AC Circuits: The R-L-C circuit in series, impedance diagram, voltage division.	Theory + lab	
11	4	A1	Series and Parallel AC Circuits: The R-L-C in parallel, admittance, current division.	Theory + lab	
12	4	A1	Power (AC): AC power: Real, Reactive and Apparent power, the power triangle, P.F. and P.F. correction.	Theory + lab	Project

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Book#1** **INTRODUCTORY CIRCUIT ANALYSIS, 5th Edition (Hard Copy), 10th & 11th Editions (PDF)** **By : ROBERT L. BOYLESTAD , Prentice Hall**
Main references (sources)	**Reference#1: Charles Alexander, Fundamentals of Electric Circuits, McGraw-Hill Education; 5 edition (January 12, 2012)**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:

اساسيات الشبكات

2. Course Code:

FNET154

3. Semester / Year:

2nd Semester / First Year

4. Description Preparation Date:

5-5-2025

5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)	
4/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lect. Safa Naser Email: safa_naser@nahrainuniv.edu.iq	
8. Course Objectives	
Course Objectives	**1. To understand the fundamental concepts of computer networks, including their applications, requirements, and architecture.** **2. To develop an understanding of network performance measures such as bandwidth, latency, and delay bandwidth product.** **3. To learn about link capacity, framing, and techniques for reliable transmission, including stop and wait and sliding window protocols.** **4. To gain knowledge of Ethernet and multiple access networks, including their physical properties, access protocols, frame formats, addresses, and transmitter algorithms.** **5. To explore wireless networking technologies, including 802.11/WiFi, 802.15.1/Bluetooth, and cell-phone technologies.** **6. To understand switching and bridging in network environments.** **7. To acquire knowledge about basic internetworking with Internet Protocol (IP), including the service model, datagram delivery, packet format, and fragmentation and reassembly.** **8. To learn about global addressing and classes in IP networks.** **9. To develop skills in subnetting and classless addressing.** **10. To gain practical experience through hands-on lab sessions, including configuring network components, building LANs, investigating network protocols using tools like Wireshark, and performing subnetting exercises using simulation software.**
9. Teaching and Learning Strategies	
Strategy	**The main strategy employed in delivering the FNET154 module is to foster active student participation and enhance critical thinking skills. This will be achieved through interactive classes, practical experiments, group work, and discussions. By encouraging students to actively engage with the course material, ask questions, and participate in problem-solving activities, they will develop a deeper understanding of computer networks.**

	The inclusion of critical thinking exercises and the utilization of multimedia resources further enhance the learning experience. Through these strategies, students will not only gain theoretical knowledge but also have the opportunity to apply it in real-world scenarios, refining their critical thinking abilities and fostering a collaborative learning environment.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	4	A1	Introduction to course layout, computer networks applications, requirements, architecture (layering and protocols), Internet architecture	Theory + lab	
3	4	A1	Network performance measures (bandwidth, latency, and delay bandwidth product).	Theory + lab	Quiz1
4,5	4	A1	Link capacity, framing, reliable transmission, stop and wait and sliding window	Theory + lab	
6	4	A1	Ethernet and multiple access networks, physical properties, access protocol frame format, addresses and transmitter algorithm	Theory + lab	Test 1
7	4	A1	Midterm Exam 1	Theory + lab	Quiz2
8,9	4	A1	wireless networking (802.11/WiFi, 802.15.1/Bluetooth, and cell-phone technologies)	Theory + lab	
10	4	A1	Switching and bridging,	Theory + lab	Test 2
11,12	4	A1	Basic Internetworking with Internet Protocol (IP), service model, datagram delivery, packet format, and fragmentation and reassembly	Theory + lab	
13	4	A1	Midterm Exam 2	Theory + lab	
14	4	A1	Global addressing and classes	Theory + lab	
15	4	A1	Subnetting and classless addressing	Theory + lab	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Book#1: Richard M. Roberts and Chuck Easttom, Networking Fundamentals, 3rd edition, The Goodheart-Willcox Co., 2020**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

وصف مقررات المرحلة الثانية

1.	Course Name:
	اللغة الانكليزية 2
2.	Course Code:
	ENGL200
3.	Semester / Year:
	1st Semester / Second Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

رقم الأسبوع ( )	استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )										
اسم المادة											
عدد الساعات											
اسم التدريسي + التوقيع+ التاريخ											
اسم الطالب											

6.	Number of Credit Hours (Total) / Number of Units (Total)
	2/2
7.	Course administrator's name (mention all, if more than one name)
	Name: Asst. Prof. Dr. Raghad Shakir Email: Raghad_Shakir@nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	**1. To develop problem solving skills and understanding of related engineering mathematics topics** **2. To understand Laplace transform and its properties.** **3. To understand Fourier analysis and transform in signal analysis and spectral measure.** **4. To develop skills in evaluating multiple integral in different coordinate systems covering physical applications.** **5. To perform partial derivatives.**

9. Teaching and Learning Strategies

Strategy	**The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and group based solving problems.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1	1.Sentences with multiple clauses, coordinate connectors	Theory	
2	2	A1	2.Dates and time	Theory	Quiz1
3	2	A1	3.essay writing, essay topic	Theory	
4	2	A1	1. Sentences with multiple clauses, adverb clauses connectors (time, cause, condition, etc.)	Theory	Test 1
5	2	A1	2.expressing yourself	Theory	Quiz2
6	2	A1	3.writing skills: decode the topic	Theory	
7	2	A1	1.Know when to use the past and the present, Use "have" and "had" correctly	Theory	Test 2
8	2	A1	2.common expressions	Theory	
9	2	A1	3.writing skills: develop supporting ideas	Theory	
10	2	A1	1.Comparatives and superlatives	Theory	
11	2	A1	2.common expressions	Theory	
12	2	A1	3.Writing skills: Introductory paragraph	Theory	Report
13	2	A1	1.Subject verb agreements	Theory	
14	2	A1	2.The processor	Theory	Seminar
15	2	A1	3.writing skills: Write unified supporting paragraphs	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Keith Boecker, P. Charles Brown, Oxford English for Computing, Oxford University press. -Prentice Hall, Writing &Practice Communication in Action, Pearson, Prentice Hall.
Recommended books and references (scientific journals, reports…)	Longmann Preparation Course of the TOEFL test .the paper test
Electronic References, Websites	http://www.english for every one.com

1.	Course Name:
	رياضيات هندسية 1
2.	Course Code:
	EGMM201
3.	Semester / Year:
	1st Semester / Second Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	4/3
7.	Course administrator's name (mention all, if more than one name)
	Name: Prof. Dr. Emad Hasan Abood Email: emad@coie-nahrain.edu.iq

8. Course Objectives

Course Objectives	**1. To develop problem solving skills and understanding of related engineering mathematics topics** **2. To understand Laplace transform and its properties.** **3. To understand Fourier analysis and transform in signal analysis and spectral measure.** **4. To develop skills in evaluating multiple integral in different coordinate systems covering physical applications.** **5. To perform partial derivatives.**

9. Teaching and Learning Strategies

Strategy	**The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time**

	refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and group based solving problems.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Multiple Integral: Basic Definitions, Physical applications	Theory	
2	4	A1	Triple integral, Cylindrical coordinates, Spherical coordinates.	Theory	Quiz1
3	4	A1	Partial Derivatives	Theory	
4	4	A1	Functions of two or more variables, Limits and continuity, Partial derivatives.	Theory	Test 1
5	4	A1	Ordinary Differential Equations:	Theory	Quiz2
6	4	A1	Basic concepts (order, degree, initial condition, general solution, particular solution).	Theory	
7	4	A1	Types of differential equations (1st order, 2nd order, higher orders DE).	Theory	Test 2
8	4	A1	Methods for solving 1st order: separable method, Homogeneous method, Exact method	Theory	
9	4	A1	Linear & Bernoulli methods, Methods for solving 2nd order homogenous DE with a constant coefficient.	Theory	
10	4	A1	Wronskian determined, Methods for solving 2nd order Non homogenous DE (variation of parameters, undermined and determined). ,	Theory	
11	4	A1	Euler equation, Higher order DE	Theory	
12	4	A1	Application Examples of DE	Theory	Report
13	4	A1	Vector Differential Calculus, Basic Definitions, Dot Product, Cross Product.	Theory	
14	4	A1	Vector and Scalar Functions, Vector Derivatives, Curves, Arch Length, Curvature,	Theory	Seminar
15	4	A1	Kinds of curves, tangent of curves, length and arc length of curves, chain rule.	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Book#1 Thomas and Finney, Calculus and Analytic Geometry, Pearson Education Inc,11th Ed. 2008.
Main references (sources)	win Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons Inc, 10th Ed. 2011.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
الاحتمالية و الاحصاء
2. Course Code:
PBST202
3. Semester / Year:
1st Semester / Second Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Lect. Dr. Khalid Waleed Hameed Email: kwh_sat@nahrainuniv.edu.iq
8. Course Objectives

Course Objectives	**1-To understand the probability concept** **2-To deal with set theory and statistical measures**

	3- To understand different statical measures and their representations. **4-To know different probability distribution functions and their applications** **5- To understand random variables and processes.**

9. Teaching and Learning Strategies

Strategy	**Weekly lectures and tutorial session to ensure better understanding** **Quizzes and exams to ensure student learning**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Review of Sets Theory,	Theory	
2	4	A1	Combinatorial analysis: Permutation and Combination	Theory	Quiz1
3	4	A1	Data representation	Theory	
4	4	A1	Tables: Frequency distribution table, Relative frequency distribution, Cumulative frequency distribution	Theory	Test 1
5	4	A1	Figures: Histogram, Frequency polygon, Ogives, Pi chart	Theory	Quiz2
6	4	A1	Statistical measurements:	Theory	
7	4	A1	Centrality (mean, median and mode)	Theory	Test 2
8	4	A1	Dispersion (range, variance, standard deviation)	Theory	
9	4	A1	Position (percentile, quartile, inter-quartile range)	Theory	
10	4	A1	Moments (laws, values meaning, 3 examples on each moment)	Theory	
11	4	A1	Mean, Variance, Skewness, Kurtosis	Theory	
12	4	A1	Elementary probability Theory, axioms of probability joint probability , Random Experiment, independent and mutually exclusive events.	Theory	Report
13	4	A1	Conditional Prob.	Theory	
14	4	A1	Joint prob. And conditional probability, Total Probability, Bayes Theorem, repeated (Bernoulli) trials	Theory	Seminar
15	4	A1	Random variables.	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Book#1** Walpole & Myers, "Probability & Statistics for Engineers and Scientists", 8th Ed., 2007, Pearson Prentice Hall
Main references (sources)	**Reference#1** Spiegel & Stephens, "Statistics", Schaum's Outline series, 4th Ed., McGraw-Hill **Reference#2** egel, Schiller & Srinivasan, "Probability & Statistics", Schaum's Outline series, 3rd Ed., McGraw-Hill
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
فيزياء الكترونية
2. Course Code:
ELPH203
3. Semester / Year:
1st Semester / Second Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

رقم الأسبوع ( )	استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )										
اسم المادة											
عدد الساعات											
اسم التدريسي + التوقيع+ التاريخ											
اسم الطالب											

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Lect. Noora Hani Email: noora_hani@nahrainuniv.edu.iq
8. Course Objectives

Course Objectives	**1. To make students familiar with basic electronics and semiconductors.** **2. To learn the components of Diodes and its P-N junction construction.** **3. To learn how to use diodes in simple circuits.** **4. To learn about transistors and its usage with different circuits.** **5. To study the differences between BJT and FET transistors and their usage in circuit applications.** **6. Introduce the students to Operational Amplifiers and its usage.**
9. Teaching and Learning Strategies	

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Semiconductor Diodes:** ideal diode, diode resistance, semiconductor material, Bohr's model of Ge & Si, intrinsic materials, energy levels, material types, and conductivity of conductors	Theory+Lab	
2	4	A1	**Semiconductor Diodes:** extrinsic semiconductors (p-type & n-type), electrons vs. holes flow, majority & minority carriers, current density and conductivity.	Theory+Lab	Quiz1
3	4	A1	**Semiconductor Diodes:** P-N junction construction, forward biasing and reverse biasing, depletion region, operation, and diode equation, diode's characteristics.	Theory+Lab	
4	4	A1	**Semiconductor Diodes:** Diode resistance (static, dynamic and average), equivalent circuit, Zener diode, LEDs.	Theory+Lab	Test 1
5	4	A1	**Diode Applications:** load-line analysis, diode approximations, series diode configuration, parallel diodes configuration, series-parallel configurations, AND/OR gates.	Theory+Lab	Quiz2
6	4	A1	**Diode Applications:** half- wave rectifier, peak inverse voltage (PIV).	Theory+Lab	
7	4	A1	**Diode Applications:** full-wave rectifier (Bridge & Center Tap Transformer).	Theory+Lab	Test 2
8	4	A1	**Diode Applications:** Clipping and clamping circuits, Voltage Doubler and Tripler, Zener diode circuits and voltage regulation.	Theory+Lab	
9	4	A1	**Bipolar Junction Transistor (BJT):** construction, operation, configurations (CB, CE &CC).,	Theory+Lab	
10	4	A1	**Bipolar Junction Transistor (BJT):** i/p and o/p characteristics, operation regions (saturation, active & cut-off).	Theory+Lab	

11	4	A1	**BJT DC Biasing Circuits:** dc load line analysis, the Q-point, fixed-bias circuit, emitter-stabilized bias.	Theory+Lab	
12	4	A1	**BJT DC Biasing Circuits:** voltage divider bias, voltage feedback bias.	Theory+Lab	Report
13	4	A1	**BJT DC Biasing Circuits:** transistor switching circuits (inverter operation).	Theory+Lab	
14	4	A1	**FET:** construction, i/p and o/p c/cs	Theory+Lab	Seminar
15	4	A1	**FET:** Biasing circuits (fixed bias, voltage divider bias, self-bias).	Theory+Lab	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**ELECTRONIC DEVICES AND CIRCUIT THEORY, 6th Edition (Hard Copy), 7th Ed. (PDF) ROBERT BOYLESTAD and LOUIS NASHELSKY, Prentice Hall**
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:

البرمجة الشيئية جافا

2. Course Code:

OOPJ204

3. Semester / Year:

1st Semester / Second Year

4. Description Preparation Date:

5-5-2025

5. Available Attendance Forms:

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

4/3

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

Name: Assist. Prof. Dr. Lahieb M. Jawad
Email: Lahieb_Mohammed@nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	**1. To learn about Java Basics Java project in an IDE.** **2. To understand the starting point of a java project and class.** **3. To understand how to Get output from the program and get user input.** **4. To understand Storing data in memory and retrieving it later.** **5. Learn about Using variables with console output.** **6. Learn about Conditional statements and logical operators, And Switch statements.** **7. Learn about Repeating statements (For loops, While loops, Do..while).** **Lean about Working with multiple Classes and Packages, OOP, Using classes from the Java API, array of objects, The java Collections API.**

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Java Basics Java project in an IDE(Intellij, Eclipse, Netbeans) The starting point of a java project (**Main Class)** The starting point of a java class (**Main Method**) Getting output from the program (**System.out**)	Theory+Lab	
2	4	A1	Getting user input (**Scanner**) Storing data in memory and retrieving it later (**Variables**)	Theory+Lab	Quiz1

			Using variables with console output from week 1		
3	4	A1	Conditional statements and logical operators (**IF, &, |, >, <, <=, >=, ==**) And **Switch** statements. Difference between **IF** and **Switch**	Theory+Lab	
4	4	A1	Repeating statements (**For loops, While loops, Do..while**)	Theory+Lab	Test 1
5	4	A1	Storing multiple values in a single variable **Arrays. Iterating** over **Arrays** (**for i and foreach**)	Theory+Lab	Quiz2
6	4	A1	Working with multiple **Classes** and **Packages** (Creating and Using)	Theory+Lab	
7	4	A1	OOP: Creating objects and using them through **Inheritance** and **Member variables**	Theory+Lab	Test 2
8	4	A1	The word **Static,** static **Variables**, static **Methods**.	Theory+Lab	
9	4	A1	Advanced **OOP** the word **super** and **this, @Override**	Theory+Lab	
10	4	A1	What are **Exceptions?** Handling **Exceptions, try-catch** block, **throw** statement	Theory+Lab	
11	4	A1	Using classes from the **Java API** difference between **StringBuilder** and **String** And **String manpulation**	Theory+Lab	
12	4	A1	Converting between **Numbers** and **Strings String.valueOf(), Integer.parseInt()**	Theory+Lab	Report
13	4	A1	The **Date** class **Parsing** and **Formatting** Dates using **SimpleDateFormat**	Theory+Lab	
14	4	A1	**Generics Classes and Methods**	Theory+Lab	Seminar
15	4	A1	The java **Collections API** (**List**,**Set**, **Map**) and their base implementations (**ArrayList**, **HashSet**, **HashMap**)	Theory+Lab	
11. Course Evaluation					
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60					

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Book#1**: **Paul Deitel& Harvey Deitel, JAVA How to Program, 9th edition, 2011**
Main references (sources)	Reference#1:https://docs.oracle.com/javase/tutorial/extra/certification/javase-8-programmer1.html#basics
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
برمجة الوب
2. Course Code:
WEBP205
3. Semester / Year:
1st Semester / Second Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Lect. Eman Karim Jasim Email: eman_karim@nahrainuniv.edu.iq
8. Course Objectives

Course Objectives	**CSS Syntax, CSS Selectors, and CSS Declaration.**	**1.**
	To train the students to build a full-stack web application.	**2.**

	Connecting the web application to a DBMS. 3. JavaScript scripting 4. Build a full-stack application. 5.

9. Teaching and Learning Strategies

Strategy	**The main strategy in this course is to encourage students to participate in creating web application in real time environment in the lab as well as creating mini application in groups of two students.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Course Layout Introduction to course layout, structure of the Web, Web services and Servers, Overview of HTTP protocol, scripting programming languages	Theory+Lab	
2	4	A1	Web servers: Apache2, IIS, Tomcat, HTTP GET, POST	Theory+Lab	Quiz1
3,4	4	A1	Static Webpage: Creating a static personal webpage using HTML5 Creating a static personal webpage using HTML5+CSS	Theory+Lab	
5	4	A1	Client Side Scripting : Introducing JavaScript to create dynamic environment	Theory+Lab	Test 1
6	4	A1	Exam#1	Theory+Lab	Quiz2
7	4	A1	Server Side Scripting: Introducing PHP to handle server requests	Theory+Lab	
8,9,10,11	4	A1	Multiple Linked Dynamic Webpages Creating a dynamic personal login using HTML+PHP Handling requests via simple MySQL database Creating A Job application form with multiple pages Using Sessions with PHP	Theory+Lab	Test 2
12	4	A1	Exam#2	Theory+Lab	

13	4	A1	XML and Ajax : Understanding and applying XML with JavaScripting	Theory+Lab	
14	4	A1	Case study 1 : A problem to program selected by Instructor	Theory+Lab	
15	4	A1	Case study 2 : A problem to program selected by Instructor	Theory+Lab	

11. Course Evaluation	
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**HTML & CSS Design and Build Websites 1st Edition Wiley. Jon Duckett 2014**
Main references (sources)	**PHP & MySQL: Server-side Web Development 1st Wiley Jon Duckett 2020** **JavaScript The Definitive Guide 6th Oreilly David Flanagan 2011**
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
رياضيات هندسة 2
2. Course Code:
EGMM251
3. Semester / Year:
2nd Semester / Second Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3

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

Name: Prof. Dr. Emad Hasan Abood
Email: emad@coie-nahrain.edu.iq

8. Course Objectives

Course Objectives	**1. To develop problem solving skills and understanding of related engineering mathematics topics** **2. To understand differential equation and its properties.** **3. To understand different solution methods of differential equation.** **4. To develop skills and understanding of vector calculus and their physical applications.** **5. To perform differentiation and integration of vectors.**

9. Teaching and Learning Strategies

Strategy	**The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and group based solving problems.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Vector Integral Calculus**: Line Integrals, Double Integrals,	Theory	
2	4	A1	Green's Theorem, Surface area and surface Integral.	Theory	Quiz1
3	4	A1	Stokes's Theorem, Divergence Theorem.	Theory	
4	4	A1	**Laplace Transforms I** Laplace Transform. Linearity. First Shifting Theorem (*s*-Shifting), Transforms of Derivatives and Integrals.	Theory	Test 1
5	4	A1	**Laplace Transforms II** Unit Step Function, Second Shifting Theorem (*t*-Shifting), Short Impulses. Dirac's Delta Function. Partial Fractions, Gamma functions	Theory	Quiz2
6	4	A1	**Laplace Transforms III**	Theory	

			Other useful properties, Convolution. Integral Equations, Differentiation and Integration of Transforms, Systems of ODEs		
7	4	A1	**Laplace Transforms IV** Inverse Laplace Transform, General Formulas and Applications	Theory	Test 2
8	4	A1	**Laplace Transforms V** Solution of PDEs by Laplace Transforms	Theory	
9	4	A1	**Fourier Analysis I** Arbitrary Period. Even and Odd Functions. Half-Range Expansions, Forced Oscillations	Theory	
10	4	A1	**Fourier Analysis II** Approximation by Trigonometric Polynomials, Sturm–Liouville Problems. Orthogonal Functions, Orthogonal Series.	Theory	
11	4	A1	**Fourier Analysis III** Generalized Fourier Series, The use of Fourier Series in spectral analysis	Theory	
12	4	A1	**Fourier Analysis IV** Fourier Integral, Fourier Cosine and Sine Transforms, Fourier Transform. Fourier Transform properties.	Theory	Report
13	4	A1	**Fourier Analysis V** Fourier Transform of some useful functions, Discrete and Fast Fourier Transforms	Theory	
14	4	A1	**Series Solutions of ODE I** Power Series Method, Legendre's Equation. Legendre Polynomials $P^n(x)$, Extended Power Series Method: Frobenius Method	Theory	Seminar
15	4	A1	**Series Solutions of ODE II** Bessel's Equation. Bessel Functions J-(x) , Bessel Functions of the Y-(x). General Solution	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Book#1 Thomas and Finney, Calculus and Analytic Geometry, Pearson Education Inc,11th Ed. 2008.
Main references (sources)	win Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons Inc, 10th Ed. 2011.

Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:	
تحليل الاشارة	
2. Course Code:	
SGAN252	
3. Semester / Year:	
2nd Semester / Second Year	
4. Description Preparation Date:	
5-5-2025	
5. Available Attendance Forms:	

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6. Number of Credit Hours (Total) / Number of Units (Total)	
4/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Lect. Dr. Khalid W. Hameed Email: Khw.hameed@nahrainuniv.edu.iq	
8. Course Objectives	
Course Objectives	**1. To understand the types of systems and signals** **2. To deal with signal analysis to give better understanding of signals behavior.** **3. To define different systems and their properties.** **4. To consider signal processing in spectral analysis.** **5. To use DFT and FFT** **6. To design digital filter design**

9. Teaching and Learning Strategies

Strategy	Weekly lecture, tutorial and lab session to ensure better understanding Quizzes and exams to ensure student learning

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Introduction to signals & systems;** Examples of some signals & systems. **Classification of Signals;** Continuous & discrete time signals, Deterministic and random signals, Periodic and non-periodic signals, Even and Odd signals, Time & frequency domain signals.	Theory+Lab	
2	4	A1	**Elementary signals;** Sinusoidal, Complex exponential, Rectangular, Triangular, unit impulse, unit step. **Signal operations I;** Amplitude scaling, Amplitude shift, Multiplication, Addition/Subtraction, Integration and Differentiation of signals.	Theory+Lab	Quiz1
3	4	A1	**Signal operations II;** Time shifting, folding or reversing, Scaling of signals**,** Mixed operations.	Theory+Lab	
4	4	A1	**Convolution;** Convolution integral, evaluation of convolution, Convolution of discrete time signals, Input/output relations of systems.	Theory+Lab	Test 1
5	4	A1	**System properties & Representations;** Linearity, Time invariance, Memory, Causality, Stability, Parallel and Cascade systems, Feedforward & Feedback systems, Recursive and nonrecursive systems.	Theory+Lab	Quiz2
6	4	A1	**LTI systems;** Impulse response and unit step response of LTI systems	Theory+Lab	
7	4	A1	**Fourier Analysis I; Definition of Fourier series of periodic signals, Exponential Fourier series, Line spectrum of periodic signals, Properties of F.S. analysis. Definition of Fourier Transform of**	Theory+Lab	Test 2

			nonperiodic signals, Properties of F.T.		
8	4	A1	**Fourier Analysis III;** System transfer function in frequency domain. The convolution theorem in frequency domain. Applications of F.T & convolution in signal transmission.	Theory+Lab	
9	4	A1	**Laplace transform of analogue signals and systems**	Theory+Lab	
10	4	A1	**Analog –to-digital and digital-to-analog conversions Sampling of analog signals, The sampling theorem, Quantization and conversion, Digital-to-analog conversion, Analog-to-digital conversion, Basic element of digital signal processing.**	Theory+Lab	
11	4	A1	**Analysis of discrete signals and systems** Representation of Systems by difference equation and block diagram, System properties, Test for Linear Time Invariant (LTI) systems, Up & Down sampling.	Theory+Lab	
12	4	A1	**Discrete-time systems** Input/output description of systems, Block diagram representation of discrete-time systems, Correlation of discrete-time signals, Properties of correlation.	Theory+Lab	Report
13	4	A1	**The Z-transform** Direct Z-transform, Inverse Z-transform, and Properties of the Z-transform.	Theory+Lab	
14	4	A1	Application of Z- transform in filtering techniques.	Theory+Lab	Seminar
15	4	A1	**Types of digital filters, Definition and characteristics.**	Theory+Lab	

11. Course Evaluation
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**Text book: Signals and Systems by Simon Haykin and Barry Veen, 2nd Edition / 2005**
Main references (sources)	Website: MIT Open Courseware (https://ocw.mit.edu/)

Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1.	Course Name:
	تصميم النظام الرقمي
2.	Course Code:
	DSDD253
3.	Semester / Year:
	2nd Semester / Second Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	4/3
7.	Course administrator's name (mention all, if more than one name)
	Name: Lect. Dr. Sumaya D. Awad Email: Sumaya.Dhari@nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	• **This course deals with the combinational and sequential circuits.** • **To learn the design and analysis of multiplexers, demultiplexers, decoders, and encoders.** • **To understand the structure and the operation of basic latches (D, SR) and flip-flops (D, JK, T).** • **Learn to analyze and create timing diagrams for sequential block operation.**

	• **To study the differences between the static memory types such static SRAM, ROM, EEPROM and the dynamic memories.** • **Learn how to design and analyze the finite of state machine (FSM).** • **To perform SM Chart.** • **Learn how to design and analyze Asynchronous sequential circuits.** • **To learn VHDL and how to represent the Sequential Logic with it.** •

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Number systems and data encoding:** Convert signed/unsigned, integer/fixed-point decimal numbers to/from binary/hex representations, Perform integer/fixed-point addition/subtraction using binary/hex number representations, Define precision and overflow for integer/fixed-point, signed/unsigned, addition/subtraction operations.	Theory+Lab	
2	4	A1	**Boolean algebra applications:** Define basic (AND, OR, NOT) and derived (e.g., NAND, NOR, XOR) Boolean operations, Enumerate Boolean algebra laws and theorems, Use basic and derived Boolean operations to evaluate Boolean expressions, Write and simplify Boolean expressions by applying appropriate laws and theorems and other techniques (e.g., Karnaugh maps).	Theory+Lab	Quiz1
3,4	4	A1	**Basic logic circuits**: Describe electrical representations of TRUE/FALSE, Describe physical logic gate implementations of basic (AND, OR, NOT) and derived (e.g., NAND, NOR, XOR) Boolean operations. Describe the high-impedance condition and logic gate	Theory+Lab	

			implementation such as a tri-state buffer, Implement Boolean expressions using the two-level gate forms of AND-OR, OR-AND, NAND-NAND, NOR-NOR and positive/negative/mixed-logic conventions, Implement Boolean expressions using multiple gating levels and positive/negative/mixed-logic conventions, Discuss the physical properties of logic gates such as fan-in, fan-out, propagation delay, power consumption, logic voltage levels, and noise margin and their impact on the constraints and tradeoffs of a design. Explain the need for a hardware description language (HDL) in digital system design. Describe the logic synthesis process that transforms an HDL description into a physical implementation, implement combinational networks using an HDL and generate/verify using appropriate design tools.		
5	4	A1	**Modular design of combinational circuits:** Describe and design single-bit/multi-bit structure/operation of combinational building blocks such as multiplexers, demultiplexers, decoders, and encoders. Describe and design the structure/operation of arithmetic building blocks such adders (ripple-carry), subtractor, shifters, and comparators. Describe and design structures for improving adder performance such as carry lookahead and carry select. Analyze and design combinational circuits (e.g., arithmetic logic unit, ALU) in a hierarchical, modular manner, using standard and custom combinational building blocks. Implement combinational building blocks and modular circuits using an HDL and generate/verify using appropriate design tools.	Theory+Lab	Test 1
6,7	4	A1	**Modular design of sequential circuits:** Define a clock signal using period, frequency, and duty-cycle parameters. Explain the structure/operation of basic latches (D, SR) and flip-flops (D, JK, T). Describe propagation delay, setup time, and hold time for basic latches and flip-flops. Describe and design the structure/operation of sequential building blocks such as registers, counters, and shift registers. Analyze and create timing diagrams for sequential block operation.	Theory+Lab	Quiz2

			Enumerate design tradeoffs in using different types of basic storage elements for sequential building block implementation. Implement sequential building blocks using an HDL and generate/verify using appropriate design tools. Describe the characteristics of static memory types such static SRAM, ROM, and EEPROM. Describe the characteristics of dynamic memories. Simulation and Testing of Sequential Circuits.		
8,9	4	A1	**Control and Datapath design:** Describe a digital system that is partitioned into control+datapath and explain the need for control to sequence operations on a Datapath. Contrast the different types of Finite State Machines (FSMs): e.g., Mealy State Machine, Moore State Machine, and Algorithmic State Machine (ASM). Represent FSM operation graphically using a state diagram (e.g., Mealy state diagram, Moore state diagram, or ASM chart). Analyze state diagrams and create timing diagrams for FSM operation. Compute timing parameters such as maximum operating frequency, setup/hold time of synchronous inputs, clock-to-out propagation delays, pin-to-pin propagate delay for a control+datapath design. Design an RTL model of a control+datapath using a HDL and synthesize/verify using appropriate design tools.	Theory+Lab	
10,11	4	A1	**VHDL for Sequential Logic:** Represent flip-flops, shift registers, and counters using VHDL processes, Write sequential VHDL statements, including if-then-else, case, and wait statements. Explain the sequence of execution for sequential statements and the order in which signals are updated when a process executes. Represent combinational logic using a process. Represent a sequential logic circuit with VHDL code. a. Use two processes. b. Use logic equations and a process that updates the flip-flops. c. Use a ROM and flip-flops. Given VHDL code for sequential logic, draw the corresponding logic circuit, Compile, simulate, and synthesize a sequential logic module.	Theory+Lab	Test 2
12	4	A1	**Circuits for Arithmetic Operations:** Analyze and explain the operation of various circuits for adding, subtracting,	Theory+Lab	

			multiplying, and dividing binary numbers and for similar operations. Draw a block diagram and design the control circuit for various circuits for adding, subtracting, multiplying, and dividing binary numbers and for similar operations.		
13	4	A1	**State Machine Design with SM Charts:** State Machine Charts, Derivation of SM Charts, Realization of SM Charts.	Theory+Lab	
14	4	A1	Mid 1	Theory+Lab	
15	4	A1	**Mid2**	Theory+Lab	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**ɔk#1: Charles H. Roth, Jr.& Larry L. Kinney, "Fundamentals of Logic sign", 7th Ed. Publisher: Cengage Learning, 2014, ISBN-13:978-1-133-62847-7**
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
نظرية المعلومات و الترميز
2. Course Code:
INCO254
3. Semester / Year:
2nd Semester / Second Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Lect. Dr. Khalid W. Hameed Email: kwh_sat@nahrainuniv.edu.iq

8. Course Objectives	
Course Objectives	**1. To develop problem solving skills and understanding of related information theory and coding topics** **2. To understand information transmission system model together with basic definition and measure of information.** **3. To understand the entropy and mutual information of both discrete and continues sources.** **4. To develop skills and understanding of channel capacity and redundancy.** **5. To perform source code construction.** **6. To design different error control coding techniques**
9. Teaching and Learning Strategies	

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and group based solving problems.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Model of information transmission system** **Review of related probability and statistics topics**	Theory	
2	4	A1	**Introduction to Information Theory-I** Common sense definition of information, logarithmic measure of information. Self-information. Average information (entropy) of a discrete and continuous source, Maximum source entropy, source efficiency	Theory	Quiz1
3	4	A1	**Introduction to Information Theory-II** Transition probability matrix of channel, Discrete noiseless and noisy channel models, uniform channel. Definition of mutual information & the average mutual information.	Theory	
4	4	A1	**Information Transmission and Channel Capacity-I** Information transmission over symmetric channel, noiseless channel, Binary symmetric channel, Ternary symmetric channel. Erasure Channel. Capacity of discrete channel.	Theory	Test 1
5	4	A1	**Information Transmission and Channel Capacity-II** Channel capacity for noiseless channels, Channel efficiency and redundancy. Channel capacity for symmetric channels. Channel capacity for non-symmetric channels, binary non-symmetric channel.	Theory	Quiz2
6	4	A1	**Information Transmission and Channel Capacity-III** Mutual information of continuous channel, Capacity of continuous channels. Efficiency and redundancy of continuous channels. Gaussian and uniform channels. Sampling of continuous source, Sampling Theorem, Nyquist theorem for transmission over band	Theory	

			limited continuous channel. Shannon-Hartley channel capacity theorem.		
7	4	A1	**Source Coding and Data Compression-I** Source encoding; fixed and variable length codes, prefix property, Average length of source code, Source code efficiency and redundancy. Shannon-Fano source coding.	Theory	Test 2
8	4	A1	**Source Coding and Data Compression-II** Huffman source coding, compact codes, Source extension.	Theory	
9	4	A1	**Source Coding and Data Compression-III** Statistical compression techniques (Arithmetic Coding) , Standard Source Coding and Compression Examples.	Theory	
10	4	A1	**Source Coding and Data Compression-IV**. Dictionary Based Techniques (LZW), Transform coding for image, audio and video signals	Theory	
11	4	A1	**Error Control Coding-I** The channel coding, Main idea of error correction & detection codes, code rate (efficiency). Block and convolutional codes, Parity check codes, Binary repetition code, ASCII representation and other applications of channel coding	Theory	
12	4	A1	**Error Control Coding-II** Linear block codes, Matrix representation of linear block codes, Hamming codes, syndrome decoding, Hamming bound, and distance properties of LBC.	Theory	
13	4	A1	**Error Control Coding-III** Polynomial representation of block codes. Cyclic codes	Theory	
14	4	A1	**Error Control Coding-IV** GF (2^m) field definition, Construction of finite field, mathematical operations in GF field, Design of BCH codes using GF field	Theory	
15	4	A1	**Error Control Coding-V** convolutional Codes	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	**G. Fiche & G. Hébuterne, " Mathematics for Engineers", 1st Ed., John Wiley & Sons, Inc., 2007** **. C.Moreira & P.G. Farrell, "Essentials of Error Control Coding ", 1st Ed., Prentice Hall, 2006**
Main references (sources)	J. C.Moreira & P.G. Farrell, "Essentials of Error Control Coding ", 1st Ed., Prentice Hall, 2006
Recommended books and references (scientific journals, reports…)	

1.	Course Name:
	اساسيات الادارة
2.	Course Code:
	PRMG255
3.	Semester / Year:
	2nd Semester / Second Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	2/2
7.	Course administrator's name (mention all, if more than one name)
	Name: Lect. Dr. Ammar Nema Email: ammar_nema@nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	**1- To demonstrate theoretical knowledge in management course.** **2- To gain practical skills and personal attributes and competencies that is required for managerial position.** **3- To describe the four management functions of planning, organizing, leading, and controlling.** **4- To outline the historical evolution of management theories.** **5- To explain how decisions are made within an organization and how those decisions are communicated to the various stakeholders.** **6- To relate the basic concepts of planning: the importance of planning, strategic planning, and the types of objectives and plans developed by organizations.**

	7- To describe the various forms of structure available to an organization. **8- To describe the control process including: the importance of control, tools for measuring organizational performance, and managerial actions.**

9. Teaching and Learning Strategies

Strategy	**The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and group based solving problems.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1	Managing and Performing, Managerial Decision Making	Theory	
2	2	A1	The History of management	Theory	Quiz1
3	2	A1	External and Internal organizational Environments and Corporate Culture	Theory	
4	2	A1	Ethics, corporate social responsibility	Theory	Test 1
5	2	A1	International Management	Theory	Quiz2
6	2	A1	The Strategic Analysis.	Theory	
7	2	A1	First Assessment (Lecture will continue after the assessment)	Theory	Test 2
8	2	A1	The Strategic Management Process	Theory	
9	2	A1	Continue: The Strategic Management Process	Theory	
10	2	A1	, Selection Criteria	Theory	
11	2	A1	Organizational Structures	Theory	
12	2	A1	Human Resource Management	Theory	Report
13	2	A1	Second assessment +Continue Human Resource Management	Theory	
14	2	A1	Leadersip	Theory	Seminar
15	2	A1	Work Motivation for performance	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	ook#1 Principles of Management, Anastasia H. Cortes, David S Bright, and Eva Hartmann, 1st Edition, 2019
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:	
قاعدة البيانات	
2. Course Code:	
DDBB259	
3. Semester / Year:	
2nd Semester / Second Year	
4. Description Preparation Date:	
5-5-2025	
5. Available Attendance Forms:	

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6. Number of Credit Hours (Total) / Number of Units (Total)	
4/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Prof. Dr. Lahieb Mohammed Jawad Email: lahieb.m.jawad@nahrainuniv.edu.iq	
8. Course Objectives	
Course Objectives	**1. To learn the theory of the database.** **2. To understand The Entity Relationship Model.** **3. To Introduce SQL and SQL and relational database concepts.** **4. To understand the Constraints imposed in a database.**

	5. Learn about Boolean Operators in SQL. 6. Learn about Normalization of a database. 7. Learn about Storage and Query Processing, transaction, and recovery.

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Introduction to the theory: What is the benefit of using a database versus a shared file system? What is Data models and the relational database system? Data independence versus data-dependent data and how a database addresses these two issues. The Three-level Architecture and why it is necessary. What are the characteristics of each of these levels and the role of the database administrator in establishing the separation of these levels? What is database management systems, its components and how they work together.	Theory+Lab	
2,3	4	A1	The Entity Relationship Model: ER diagrams, resolution of M:N relationships, and Table Instance Charts (TICs). Translations of TICs into relational tables.	Theory+Lab	Quiz1
4	4	A1	Introduction to SQL and relational database concepts: Relations and attributes. Candidate and primary keys. Foreign keys and why they are necessary. Introduction to relational operators and how they are applied. Learning how to interact with Oracle through the SQL*Plus. Creating and deleting tables.	Theory+Lab	
5	4	A1	Constraints imposed in a database: Updating and deleting rows in a table using the UPDATE TABLE, DELETE	Theory+Lab	Test 1

			TABLE, and the DROP TABLE command with and without constraints. Implementation of the Selection and Projection operators. Ordering the results of a table according to a given attribute in ascending or descending orders.		
6	4	A1	Normalization of a database.: First, second and third normal forms. How to detect anomalies and use of the Armstrong's axioms for determining functional dependencies. Importance of normalizing a database and the types of anomalies that may be encountered in First, Second, and Third Normal Forms. How to recognize, prevent, and how to get rid of anomalies in these forms.	Theory+Lab	Quiz2
7	4	A1	Continuation of the normalization process.: BCNF form and Dependency preservation. Algorithms to ensure dependency preservation. The Join operator and its different types. Advantages and disadvantages of higher normal forms from an operational point of view.	Theory+Lab	
8,9	4	A1	Boolean Operators in SQL: pattern matching using the LIKE clause, % and underscore characters. Arithmetic Operations and use of built-in functions in SQL. Introduction to Group functions using the Group by clause and additional built in functions. Processing dates and time and basic arithmetic with dates. Formatting of dates and times.	Theory+Lab	Test 2
10	4	A1	Storage and Query Processing: RAID, Storage access, indexing and hashing, query processing and query optimization.	Theory+Lab	
11	4	A1	Transaction Management: Transactions and concurrency control. The notion of transactions, ACID properties of transactions, concurrent schedules, serializability, locking protocols.	Theory+Lab	
12	4	A1	Database Recovery Techniques: Recovery Techniques Based on Immediate Update, Shadow Paging, The ARIES Recovery Algorithm, Recovery in Multidatabase Systems, Database Backup and Recovery from Catastrophic Failures.	Theory+Lab	
13	4	A1	Non-SQL Database	Theory+Lab	
14	4	A1	Mid-1	Theory+Lab	Report
15	4	A1	Mid-2	Theory+Lab	
11. Course Evaluation					
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60					

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Book#1: C. J. Date, "Introduction to Database Systems", 8th Ed. Publisher: Addison-Wesley, 2003** **Book#2: Ramez Elmasri, Shamkant B. Navathe, " Fundamentals of Database Systems",7th Ed. Publisher: Pearson, 2016.**
Main references (sources)	Website: MIT Open Courseware (https://ocw.mit.edu/)
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

وصف مقررات المرحلة الثالثة

1.	Course Name:
	الديمقراطية
2.	Course Code:
	DEMO300
3.	Semester / Year:
	1st Semester / Third Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	2/2
7.	Course administrator's name (mention all, if more than one name)
	Name: Assist. Prof. Dr. Jabbar Ismael Email: jabbar_ismael@nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	**ان مادة حقوق الانسان من المواد الهامة والضرورية للطلبة حيث يتم تعريفهم بمفهوم حقوق الانسان ومبادىء وقيم هذه الحقوق وضمانتها من الانتهاك على كافة الصعد ومن ثم ماهو مستقبل هذه الحقوق في ظل التطور والتقدم التكنولوجي وتجليات العولمة وخلق ثقافة تساعد على تنمية حقوق الانسان للجميع والدفاع عنها حيث ان هذه الحقوق منذ ان ولد الانسان ولدت معه حقوقه.** **وكذلك مادة الديمقراطية من المواد الهامة والضرورية للطلبة حيث ان الطالب يحتاج الى المام بثقافة الديمقراطية ومعرفتها العلمية لما في ذلك من اهمية كبيرة في فهم تطورها عبر العصور ومفهومها واشكالها وسبل ممارستها ، كما ان دراسة الديمقراطية دراسة علمية سيسهم في ارساء دولة القانون التي تعتمد الديمقراطية اساسا وركيزة لبنائها..**

9. Teaching and Learning Strategies

Strategy	القدرة على معرفة هذه الحقوق والحريات والعمل بها

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1	جذور مفهوم الديمقراطية وتطوره	Theory	
2	2	A1	في تعريف الديمقراطية	Theory	Quiz1
3	2	A1	الديمقراطية العالمية والخصوصية	Theory	
4	2	A1	=	Theory	Test 1
5	2	A1	اشكال الديمقراطية/الديمقراطية المباشرة	Theory	Quiz2
6	2	A1	الديمقراطية شبه المباشرة	Theory	
7	2	A1	الديمقراطية التمثيلية (النيابية)	Theory	Test 2
8	2	A1	=	Theory	
9	2	A1	الانتخاب (الية النظام التمثيلي)	Theory	
10	2	A1	=	Theory	
11	2	A1	تنظيم عملية الانتخاب	Theory	
12	2	A1	=	Theory	Report
13	2	A1	نظم الانتخابات	Theory	
14	2	A1	=	Theory	Seminar
15	2	A1	الحكم الصالح	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	ook#1 Principles of Management, Anastasia H. Cortes, David S Bright, and Eva Hartmann, 1st Edition, 2019
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1.	Course Name:
	طرق عددية
2.	Course Code:
	NUMD301
3.	Semester / Year:
	1st Semester / Third Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

رقم الأسبوع ( )	استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )										
اسم المادة											
عدد الساعات											
اسم التدريسي + التوقيع+ التاريخ											
اسم الطالب											

6.	Number of Credit Hours (Total) / Number of Units (Total)
	4/3
7.	Course administrator's name (mention all, if more than one name)
	Name: Lect. Dr. Raya Kahtan Mohammed Email: rayakhahtan@coie-nahrain.edu.iq

8. Course Objectives	
Course Objectives	**1. To develop problem solving skills and understanding of related numerical methods topics** **2. To understand absolute and relative errors, rounding and computer errors.** **3. To understand how to find roots of equation using numerical methods.** **4. To analyze system of linear equation.** **5. To perform methods of least square and interpolation.** **6. To evaluate different numerical integration** **7. To determine numerical differentiation**

	8. To solve numerically ordinary differential equation and related physical systems

9. Teaching and Learning Strategies

Strategy	**The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and group based solving problems.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Introduction to numerical methods I** Absolute and relative errors, Rounding and chopping, Computer errors in representing numbers.	Theory+Lab	
2	4	A1	**Introduction to numerical methods II** Review of Taylor series and some useful mathematical relations	Theory+Lab	Quiz1
3	4	A1	**Roots of Equations I** Graphical Methods, Bisection method, Newton method	Theory+Lab	
4	4	A1	**Roots of Equations II** Secant method, Systems of nonlinear equations	Theory+Lab	Test 1
5	4	A1	**Systems of Linear Equations I** Gaussian elimination, Gaussian elimination with scaled partial pivoting and Tri-diagonal systems.	Theory+Lab	Quiz2
6	4	A1	**Systems of Linear Equations II** Gauss-Jordan method	Theory+Lab	
7	4	A1	**Methods of Least Squares** Linear Regression, Polynomial Regression, Multiple Linear Regression	Theory+Lab	Test 2

8	4	A1	**Interpolation** Newton's Divided Difference method, Lagrange interpolation, Inverse Interpolation	Theory+Lab	
9	4	A1	**Numerical Integration I** Trapezoid rule, Simpson's Rules	Theory+Lab	
10	4	A1	**Numerical Integration II** Romberg algorithm	Theory+Lab	
11	4	A1	**Numerical Differentiation I** Estimating derivatives	Theory+Lab	
12	4	A1	**Numerical Differentiation II** Richardson Extrapolation	Theory+Lab	Report
13	4	A1	**Ordinary Differential Equations I** Euler's method, Improvements of Euler's method, Runge-Kutta methods,	Theory+Lab	
14	4	A1	**Ordinary Differential Equations II** Methods for systems of equations, Adaptive RK Methods, Multistep Methods, Boundary value problems	Theory+Lab	Seminar
15	4	A1	**Useful Applications of Numerical Analysis**	Theory+Lab	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Text Book : Numerical Methods for Engineers Author : Steven C. Chapra and Raymond P. Canal Publisher : McGraw Hill Edition & Year: 6th Edition, 2010
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
شبكات الحاسوب
2. Course Code:
CNET302
3. Semester / Year:
1st Semester / Third Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Prof. Mustafa Abd Kadhim Email: Mustafa_ak@nahrainuniv.edu.iq

8. Course Objectives	
Course Objectives	**1. To continue the learning of the Networking layers beginning with ICMP protocol.** **2. To understand Link layer protocols.** **3. To understand Multiaccess and how it works.** **4. To understand Network switching.** **5. Learn about Network virtualization.** **6. Learn about physical layer, wireless links.** **7. Learn about cellular technologies, and security in the Network layer like IPsec and VPN.**

9. Teaching and Learning Strategies	
Strategy	**The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved**

	through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Defining service, protocol, network edge, network core – packet and circuit switching	Theory+Lab	
2	4	A1	Delay, loss, and throughput in packet-switched Networks	Theory+Lab	Quiz1
3	4	A1	Layered architecture and encapsulation	Theory+Lab	
4	4	A1	The Web and HTTP protocol, Web caching	Theory+Lab	Test 1
5	4	A1	Domain Name System, Video streaming with case studies of Netflix, YouTube, and Kankan	Theory+Lab	Quiz2
6	4	A1	EXAM-I	Theory+Lab	
7	4	A1	Services, multiplexing and demultiplexing, connectionless (UDP)	Theory+Lab	Test 2
8	4	A1	Reliable data transfer and TCP	Theory+Lab	
9	4	A1	Forwarding and routing, service model, Internet protocol version 4 addressing, subnetting, and CIDR	Theory+Lab	
10	4	A1	Network address translation, Internet protocol version 6	Theory+Lab	
11	4	A1	Generalized forwarding and Software Defined Networks	Theory+Lab	
12	4	A1	EXAM-II	Theory+Lab	Report
13	4	A1	Practicing network design with IPv4 addressing and subnetting	Theory+Lab	
14	4	A1	Routing algorithms, Distance vector and Link state	Theory+Lab	Seminar
15	4	A1	SDN control plane and Open-flow protocol	Theory+Lab	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Text Book : Numerical Methods for Engineers Author : Steven C. Chapra and Raymond P. Canal Publisher : McGraw Hill

	Edition & Year: 6th Edition, 2010
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1.	Course Name:
	اتصالات البيانات
2.	Course Code:
	COMM303
3.	Semester / Year:
	1st Semester / Third Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	4/3
7.	Course administrator's name (mention all, if more than one name)
	Name: Prof. Dr. Abdulkareem A. Kadhim Email: Abdulkareem_ak@nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	**1. To develop problem solving skills and understanding of data communication and related topics.** **2. To understand how modulation and demodulation of message signals.** **3. To deal with the basic concept of analog and digital modulation.**

	4. To understand sampling theorem and pulse modulation and their applications. 5. To understand digital modulated signals (ASK, PSK, FSK, QAM, MSK). 6. To understand data link control protocols 7. To investigate different switching techniques (Circuit, packet, virtual)

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Elements of Communication system	Theory+Lab	
2	4	A1	Introduction to Data Transmission System	Theory+Lab	Quiz1
3	4	A1	Signals and Systems-I: Classification of Signals, Signal and system bandwidths, single-tone and multi-tone signals.	Theory+Lab	
4	4	A1	Definition of Signals and Systems-II: Fourier Series, Line Spectrum, Fourier Transform, Modulation Property, Linear Time Invariant System, Ideal Filters, Power and Energy spectral density, Noise and distortion in Communication Systems, Signal-to-Noise Ratio.	Theory+Lab	Test 1
5	4	A1	Linear Modulation-I: Double-Side-Band Suppressed Carrier (DSB-SC), Double-Side-Band with Large Carrier (DSB-LC), Single-Side-Band (SSB), Coherent and noncoherent demodulation,	Theory+Lab	Quiz2
6	4	A1	Linear Modulation-II: Vestigial Side Band, Quadrature Amplitude Modulation (QAM), Frequency	Theory+Lab	

			Mixers in communication systems, Standard Receiver.		
7	4	A1	Angle Modulation-I: Frequency Modulation (FM), Phase Modulation (PM), Spectrum of Angle Modulated Wave, Narrow & wideband signals.	Theory+Lab	Test 2
8	4	A1	Angle Modulation-II: The Phased Locked Loop Principles & Applications, Generation & Reception of FM Signal. FM stereophonic system, FM Standard Radio Receiver.	Theory+Lab	
9	4	A1	Pulse Modulations and Codec I: Sampling Theorem, Practical Sampling, Pulse Amplitude Modulation (PAM)	Theory+Lab	
10	4	A1	Pulse Modulations and Codec II: Pulse Width Modulation (PWM), Pulse Time Modulation. (PPM), PCM for speech signals, Uniform and Non-uniform Quantizers, Differential PCM, Linear Delta Modulation, DM with Double Integrations, Delta Sigma Modulation, Adaptive DM	Theory+Lab	
11	4	A1	Transmission of Digital Signals-I: Baseband and Passband Transmission, Types of line codes, the derivation of Power Spectral Density (PSD) of digital Signals, PSD of some important line codes, Pulse Shaping & ISI reduction.	Theory+Lab	
12	4	A1	Transmission of Digital Signals-II: Amplitude Shift Keying (ASK), On-Off Keying (OOK), Phase Shift Keying (PSK), Differential PSK and QPSK Frequency Shift Keying (FSK).	Theory+Lab	Report
13	4	A1	Transmission of Digital Signals-III: Minimum Shift Keying (MSK), Bandwidth Versus Transmission Rate Comparison of Different Signals.	Theory+Lab	
14	4	A1	Data Transmission: Analog and Digital Data Transmission, Transmission Impairments, Channel Capacity.	Theory+Lab	Seminar
15	4	A1	Transmission Media: Guided Transmission Media, Wireless Transmission, Wireless Propagation, Line of Sight transmission.	Theory+Lab	
11. Course Evaluation					
					Quiz and Assignments:10

	Mid-terms Exam:30 Final Exam: 60
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Text book-1: Modern digital and analog communication systems Author: B.P. Lathi and Z. Ding Publisher : Oxford University Press Inc. Edition & Publication Year: 4th Ed., 2010 Text book-2: Data & Computer Communications Author : William Stalling Publisher: Pearson Prentice Hall Edition & Publication Year : 8th Ed., 2010
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
انظمة التشغيل
2. Course Code:
OSYS304
3. Semester / Year:
1st Semester / Third Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Sarmad M. Hadi

Email: sarmad@nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	**1. To learn and understand how operating systems work** **2. To learn operating system architecture, virtual memory, paging.** **3. To understand threads and scheduling.** **4. To learn how CPU and operating system works interoperable and CPU scheduling algorithms.** **5. To learn and understand OS kernel and different OSes available.** **6. To understand I/O devices and management within OSes.**

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Operating System Overview:** The evolution of operating systems, Major Achievements.	Theory+Lab	
2	4	A1	**Process Description and Control:** What Is a Process? process states, process description, process control.	Theory+Lab	Quiz1
3	4	A1	**Threads:** types of threads, multithreading models.	Theory+Lab	
4,5	4	A1	**Process synchronization:** background, the critical-section problem, synchronization hardware, semaphores,	Theory+Lab	Test 1

			deadlocks and starvation.		
6	4	A1	**Midterm Exam 1**	Theory+Lab	Quiz2
7	4	A1	**Virtual Memory:** Hardware and control structure.	Theory+Lab	
8	4	A1	**CPU scheduling: Uniprocessor:** basic concepts, criteria, and algorithms	Theory+Lab	Test 2
9	4	A1	**CPU scheduling: Multiprocessor:** Real-time scheduling	Theory+Lab	
10, 11	4	A1	**I/O Management and Disk Scheduling:** I/O Devices, Organization of the I/O Function, Operating System Design Issues.	Theory+Lab	
12	4	A1	**Midterm Exam 2**	Theory+Lab	
13	4	A1	**Computer security threads:** Computer Security Concepts, Threats, Attacks, and Assets, Intruders, Malicious Software, Viruses, Worms, and Bots.	Theory+Lab	
14-15	4	A1	**Computer security techniques:** Authentication, Access Control, Intrusion Detection, Malware Defense.	Theory+Lab	Report

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	liam stalling, OPERATING SYSTEMS INTERNALS AND DESIGN PRINCIPLES, 9th Ed., Pearson, 2018
Main references (sources)	
Recommended books and references (scientific journals, reports…)	. Silberschatz, Peter B. Galvin, and G. Gagne, Operating system concepts, 8th Edition, Addison-Wesely, 2008

Electronic References, Websites	

1. Course Name:
الذكاء الصناعي
2. Course Code:
AINT307
3. Semester / Year:
1st Semester / Third Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )	رقم الأسبوع ( )
	اسم المادة
	عدد الساعات
	اسم التدريسي + التوقيع+ التاريخ
	اسم الطالب

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Prof. Dr. Lahieb M. Jawad Email: lahieb.m.jawad@nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	1. To learn Artificial Intelligence: what is AI, why do we need. 2. To understand Predicate calculus (logic). 3. To Introduce Inference rules (Resolution theorem proving). 4. To understand Network representation. 5. Learn about Procedural representation. 6. Learn about Problem Solving using State Space. 7. Learn about Blind search. 8. Learn about Heuristic search, using heuristic in games and MArcov models.

9. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes,

	interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Introduction to Artificial Intelligence: what is AI, why do we need AI, An overview of some of AI approach applications.	Theory+Lab	
2,3	4	A1	Predicate calculus (logic): Prepositional calculus (logic), Predicate calculus (logic), constants, variables, functions, predicates and how to represent English statements using predicate logic, syntax and semantic of predicate logic.	Theory+Lab	Quiz1
4	4	A1	Inference rules (Resolution theorem proving): convert to clause form. Examples of resolution with propositional and predicate logic.	Theory+Lab	
5	4	A1	Network representation: Semantic net and conceptual graphs.	Theory+Lab	Test 1
6	4	A1	Procedural representation: Production systems, forward and backward chaining, Examples of Production systems.	Theory+Lab	Quiz2
7	4	A1	Exam-I	Theory+Lab	
8	4	A1	Problem Solving using State Space: Introductory concepts and state space search, Data driven and goal driven search.	Theory+Lab	Test 2
9	4	A1	Blind search: (depth-first search, breadth-first search, depth limited search and iterative deepening search)	Theory+Lab	
10	4	A1	Heuristic search: (Hill climbing algorithm and Best first search).	Theory+Lab	
11	4	A1	Heuristic search: (A algorithm, and A* algorithm).	Theory+Lab	
12	4	A1	Exam-II	Theory+Lab	

13	4	A1	Using heuristic in games: (Minimax procedure and alpha-beta procedure	Theory+Lab	Report
14	4	A1	Introduction to Dynamic Programming	Theory+Lab	
15	4	A1	Markov models : Markov processes and Hidden Markov models	Theory+Lab	

11. Course Evaluation	
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Book#1: George F. Luger, Artificial Intelligence, structures and strategies for complex problem solving, 6th Edition, 2009. Book#2: Stuart J. Russell and Peter Norvig, "Artificial telligence, a Modern Approach", Fourth Edition, Prentice Hall, 2020
Main references (sources)	
Recommended books and references (scientific journals, reports…)	References#1: Elaine Rich and Kevin Knight, "Artificial Intelligence", McGraw-Hill ,2010. References#2:E Charniak and D McDermott, "Introduction to Artificial Intelligence". References#3: Amit Konar, "Artificial Intelligence and Soft computing, Behavioral and Cognitive Modeling of the Human Brain", CCR Press LLC, 2000
Electronic References, Websites	

1. Course Name:
اللغة الانكليزية 3
2. Course Code:
ENGL350
3. Semester / Year:
2nd Semester / Third Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

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

2/2

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

Name: Asst. Prof. Dr. Raghad Shakir
Email: Raghad_Shakir@nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	• **know students with essential information in the English language in association with reading, writing and speaking skills, and knowing more English vocabulary.** • **To understand pronouns, questions and short answers, tenses (present, past and future), adjective, adverb, prepositions of place, punctuation marks and practicing writing.** • **This module works towards enhancing students' English language competencies along with their technical or professional knowledge.** • **Enhance students' communication skills in English can result in better job opportunities in the future**

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1	NOUN CLAUSES: Noun Clauses with (Question Words, Whether or If, and That). Question Words Followed by Infinitives. Quoted Speech. Reported Speech: Modal Verbs in Noun Clauses. The Subjunctive in Noun Clauses	Theory	
2	2	A1	ADJECTIVE CLAUSES: Adjective Clause Pronouns, Using: (Whose, Where, and When) in -Adjective Clauses. Using Adjective Clauses to Modify Pronouns. Punctuating Adjective Clauses. Reducing Adjective Clauses to Adjective Phrases.	Theory	Quiz1
3	2	A1	**GERUNDS AND INFINITIVES: Common Verbs Followed by: Gerunds, and Infinitives. Infinitives** with Objects. Using Gerunds as the Objects of Prepositions. Gerunds and Infinitives as Subjects	Theory	
4	2	A1	**COORDINATING CONJUNCTIONS: Parallel Structure, Parallel Structure: Using Commas.** Punctuation for Independent Clauses; Connecting "Them" with "And" & "But". Paired conjunctions: Both...And; Not Only...But Also; Either...Or; Neither ...Nor	Theory	Test 1
5	2	A1	**ADVERB CLAUSES: Using Adverb Clauses to Show: Time Relationships. Cause and Effect.** Expressing Contrast Using Even Though. Showing Direct Contrast: While. Expressing Conditions in Adverb Clauses	Theory	Quiz2
6	2	A1	Mid Exam	Theory	
7	2	A1	REDUCTION OF ADVERB CLAUSES TO MODIFYING ADVERBIAL PHRASES: Changing Time Clauses to Modifying Adverbial Phrases. Expressing the Idea of "During the Same Time" in Modifying Adverbial Phrases. Expressing Cause and Effect in Modifying Adverbial	Theory	Test 2

			Phrase. Using Upon+ -----ing in Modifying Adverbial Phrases.		
8	2	A1	CONNECTIVES THAT EXPRESS CAUSE AND EFFECT, CONTRAST, AND CONDITION: Using Because Of and Due To Cause and Effect: Using Therefore, Consequently, and So. Summary of Patterns and Punctuation. Other Ways of Expressing Cause and Effect: Such ...That and So ...That. Expressing Purpose: Using So That.	Theory	
9	2	A1	**CONDITIONAL SENTENCES AND WISHES: Overview of Basic Verb Forms Used in Conditional Sentences. Expressing Real Conditions in the Present or Future. Using "Mixed Time" in** Conditional Sentences. Wishes About the Present, Past, and Future. Use of Wish + Would	Theory	
10	2	A1	ASKING QUESTIONS: Yes/No questions, Questions with: (where, why, when, and what time, with who. who(m) and what). Using: (how often, how far, which, what kind of, and what + a form of do). Using how about and what about, Tag questions.	Theory	
11	2	A1	MODAL AUXILIARIES: Expressing ability: can and could. Expressing possibility: May and Might Expressing permission may and can. Polite questions. Expressing advice. Expressing necessity. Making logical conclusions. Making suggestions. Stating preferences.	Theory	
12	2	A1	WRITING Thesis: How to avoid plagiarism, Summary & paraphrase. Writing and analysis of abstracts.	Theory	Report
13	2	A1	WRITING Thesis: How to read and how to organize notes. take notes, How to write a thesis statement (Active/Passive voice). How to write introductions & conclusions.	Theory	
14	2	A1	The WRITING Thesis: research process Styles of documentation, Use of sources, Skills of Information Competency, Tools of Research.	Theory	Seminar
15	2	A1	Mid Exam	Theory	

11. Course Evaluation	
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	nderstanding and using English grammar, 5th edition, Betty S. Azar and Stacy A. Hagen
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Fundamentals of English Grammar, 3rd edition, Betty S. Azar, 2003
Electronic References, Websites	

1. Course Name:
انظمة الحاسوب و المعالجات
2. Course Code:
CSMP351
3. Semester / Year:
2nd Semester / Third Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Ammar A. Abdulkareem A. Email: Ammar_abdulmalek@nahrainuniv.edu.iq
8. Course Objectives

Course Objectives	**1. Familiar with characteristics of computers, components of a computer, types of Computers and computer system hardware.** **2. Familiar with basic Register transfer and Microoperations like Register Transfer Language, Bus and Memory Transfer, ALU Microoperations, Arithmetic logic shift unit (ALSU).** **3. Able to understand basic computer organization and Design like instruction codes, computer registers, computer instructions, timing and control and design of basic computer.** **4. Familiar with hardware architecture of Microprocessors, computer bus, bus skew and bus types like Synchronous bus and Asynchronous bus.** **5. Understand Arithmetic and Logic Unit (ALU), CPU structure, Instruction cycle, Instruction fetch and decode, determine the type of instruction and Memory hierarchy like Cache memory and associative memory.** **6. Familiar with 8086 Microprocessor and its Architecture like Internal Microprocessor Architecture, the programming model, multipurpose registers, special registers and segment registers.** **7. Understand the addressing mode of register, Immediate, direct, register–indirect, base–plus index and register relative.** **8. Familiar with data movement instructions, arithmetic, logic, program control instructions and basic Input/output Interface.**

9. Teaching and Learning Strategies

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

10. Course Structure

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

1	4	A1	**Introduction to Computers**: Characteristics of Computers, Components of a computer, Types of Computers, Computer System Hardware	Theory+Lab	
2,3	4	A1	**Register transfer and Microoperations:** Register Transfer Language, Bus and Memory Transfer, ALU Microoperations, Arithmetic logic shift unit (ALSU).	Theory+Lab	Quiz1
4	4	A1	**Basic computer organization and Design:** Instruction codes, computer registers, computer instructions, Timing and control, Design of basic computer**.**	Theory+Lab	
5	4	A1	**Hardware architecture:** Microprocessors, Computer bus, Bus skew, **Bus types:** Synchronous bus, Asynchronous bus.	Theory+Lab	Test 1
6	4	A1	**The CPU:** Arithmetic and Logic Unit (ALU), CPU structure, Instruction cycle, Instruction fetch and decode, determine the type of instruction.	Theory+Lab	Quiz2
7	4	A1	**Memory hierarchy:** Cache memory, associative memory.	Theory+Lab	
8	4	A1	**Exam**	Theory+Lab	Test 2
9	4	A1	**The 8086 Microprocessor and its Architecture:** Internal Microprocessor Architecture, The programming Model, Multipurpose registers, special registers, segment registres.	Theory+Lab	
10	4	A1	**Addressing Modes:** Register, Immediate, Direct, Register-indirect,	Theory+Lab	

			base-plus index, register relative.		
11	4	A1	**Data Movement Instructions**:	Theory+Lab	
12	4	A1	**Arithmetic and Logic Instructions:**	Theory+Lab	
13	4	A1	**Program control instructions:**	Theory+Lab	Report
14	4	A1	**Exam**	Theory+Lab	
15	4	A1	**Using assembly language with C/ C++:**	Theory+Lab	

11. Course Evaluation	
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	M. Morris Mano, Computer Fundamentals, 3rd Ed., - Pearson Education, 1993 arry B. Brey, THE INTEL MICROPROCESSORS, 5th Ed., - Pearson, 2010
Main references (sources)	
Recommended books and references (scientific journals, reports…)	William stalling, Computer organization and - chitecture: Designing for performance, 8th Ed., Pearson, 2010,
Electronic References, Websites	

1. Course Name:
بروتكولات الشبكات
2. Course Code:
NETP352
3. Semester / Year:
2nd Semester / Third Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

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

4/3

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

Name: Prof. Dr. Emad Hasan
Email: emad@coie-nahrain.edu.iq

8. Course Objectives

Course Objectives	

9. Teaching and Learning Strategies

	Strategy	

10. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	4	A1	Review on layering model, data encapsulation, physical and logical addressing, data and control planes	Theory+Lab	
2,3	4	A1	IPv4 datagram format, fragmentation, NAT protocol, and ARP protocol	Theory+Lab	Quiz1
4	4	A1	WEB, DNS, and DHCP protocols	Theory+Lab	
5	4	A1	SNMP and the ICMP protocol	Theory+Lab	Test 1
6	4	A1	Matching and action, examples using OpenFlow	Theory+Lab	Quiz2
7	4	A1	Exam 1	Theory+Lab	
8	4	A1	Review on distance vector and link state algorithms. RIPv2	Theory+Lab	Test 2

			datagram format, OSPF protocol		
9	4	A1	CIDR and Hierarchal routing, the BGP protocol, AS paths, route aggregation, best routes, and IP anycast	Theory+Lab	
10	4	A1	UDP segment structure and checksum, TCP segment structure, Timers, and RTT estimation	Theory+Lab	
11	4	A1	TCP flow control and connection management	Theory+Lab	
12	4	A1	Principles of congestion control, causes and cost of congestion, approaches to congestion control	Theory+Lab	
13	4	A1	Exam2	Theory+Lab	Report
14,15	4	A1	Services at the link layer, error detection and correction – parity checks and CRC, multiple access techniques	Theory+Lab	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	James F. Kurose and Keith W. Ross, Computer Networking: A Top-Down Approach, 7th edition, Pearson, 2017
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Reference#1 Behrouz A. Forouzan, TCP/IP Protocol Suite, 4th edition, McGraw Hill, 2010
Electronic References, Websites	

1.	Course Name:
	برمجة الشبكات
2.	Course Code:
	NTPG353
3.	Semester / Year:
	2nd Semester / Third Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	4/3
7.	Course administrator's name (mention all, if more than one name)
	Name: Lect. Dr. Sarmad M. Hadi Email: Sarmad@nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	**TCP Programming**	**1.**
	To provide a basic knowledge about client server architecture.	**2.**
	DBMS	**3.**
	Connecting DBMS with Java	**4.**
	To provide a basic knowledge about three tier architecture	**5.**

9.	Teaching and Learning Strategies

Strategy	**This Course uses an interactive technique that includes direct participation of students in the lab as well as using a GUI to encourage the students to work with actual applications(real-time).**

10.	Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Basic Concepts, Protocols and Terminology**: Clients, Servers and Peers, Ports and Sockets, The Internet and IP Addresses, Internet Services, URLs and DNS, TCP and UDP	Theory+Lab	
2	4	A1	**Starting Network Programming in Java**: The *InetAddress* Class	Theory+Lab	Quiz1
3	4	A1	**TCP Sockets**	Theory+Lab	
4	4	A1	**Network Programming with GUIs**	Theory+Lab	Test 1
5	4	A1	**Ports scanning**	Theory+Lab	Quiz2
6	4	A1	**Multithreading and Multiplexing**	Theory+Lab	
7	4	A1	**Thread Basics, Using Threads in Java, Extending the Thread Class**	Theory+Lab	Test 2
8	4	A1	**Explicitly Implementing the Runnable Interface**	Theory+Lab	
9	4	A1	**Multithreaded Servers**	Theory+Lab	
10	4	A1	**Java Database Connectivity (JDBC) , Creating an ODBC Data Source**	Theory+Lab	
11	4	A1	**Simple Database Access**	Theory+Lab	
12	4	A1	**Modifying the Database Contents**	Theory+Lab	Report
13	4	A1	**Using a GUI to Access a Database**	Theory+Lab	
14			**Scrollable Result Sets in JDBC, Modifying Databases via Java Methods**		
15			**Design and implementation of a multithreaded gui-client server application**		

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Book#1: Jan Graba , An Introduction to Network Programming with Java: Java 7 Compatible

	, 3rd edition 2013
Main references (sources)	
Recommended books and references (scientific journals, reports…)	ferences : Elliotte Rusty Harold , Java Network Programming , Second Edition 2020
Electronic References, Websites	

1. Course Name:	
نظرية الانتظار	
2. Course Code:	
QUEU354	
3. Semester / Year:	
2nd Semester / Third Year	
4. Description Preparation Date:	
5-5-2025	
5. Available Attendance Forms:	

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

6. Number of Credit Hours (Total) / Number of Units (Total)	
4/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Salim A. Mohammed Ali Email: salimm@nahrianuniv.edu.iq	
8. Course Objectives	
Course Objectives	9. To understand the concept of Queuing system analysis 10. To learn the basics of Markov chains and its relation to Queuing systems. 11. To recognize different type of Queuing systems such as single and multi-server systems. 12. To learn the performance measurements parameters of Queuing systems and how to identify these measurements. 13. To analyze existing systems into Queuing models.

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Introduction:** Course layout, definitions of queuing theory, queuing models with case studies of File server, network router, and multiprocessor system.	Theory	
2	4	A1	**Poisson Process:** Foundation of the Poisson Process, Poisson Distribution Mean and Variance, The Inter-Arrival Time, The Markov Property, Exponential Service Times.	Theory	Quiz1
3	4	A1	**M/M/1 Queue (Part I):** Birth-death process, pure birth process, pure death process.	Theory	
4	4	A1	**M/M/1 Queue (Part II):** Foundation of the M/M/1 queueing system, flows and balancing, analysis in detail, Little's Law.	Theory	Test 1
5	4	A1	**M/M/1/K Queue:** Analysis of steady state and performance measures.	Theory	Quiz2
6	4	A1	**Exam I.**	Theory	
7	4	A1	**M/M/∞ Queue:** Analysis of steady state and performance measures.	Theory	Test 2
8	4	A1	**M/M/m Queue:** Erlang C system analysis and performance measure, using Erlang C chart to find probability of queuing.	Theory	
9	4	A1	**M/M/m/K Queue:** Analysis of steady state and performance measures.	Theory	
10	4	A1	**M/M/m/m Queue:** Erlang B system analysis and performance measure, using Erlang B chart to find probability of queuing.	Theory	
11	4	A1	**Open Queuing Networks:** The product form solution, the global balance equation, Jacksons network.	Theory	
12	4	A1	**Exam II.**	Theory	Report
13	4	A1	**Open Queuing Networks:** Practicing Open queuing network analysis	Theory	
14	4	A1	**Closed Queuing Networks (Part I)**: Cyclic network and mean value analysis	Theory	
15	4	A1	**Closed Queuing Networks (Part II):** Practicing MVA of closed queuing network	Theory	

11. Course Evaluation

	Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Book#1: Thomas G. Robertazzi, Computer Networks and Systems: Queueing Theory and Performance Evaluation, 1st Edition, Springer-Verlag, 1990.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
شبكات المساحة الخزنية
2. Course Code:
SANN356
3. Semester / Year:
2nd Semester / Third Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Prof. Mustafa A. Neamah Email: mstfkadum@nahrainuniv.edu.iq
8. Course Objectives

Course Objectives	• To learn about storage devices, HDD and SSD • To understand the performance of these storage devices.

	• To understand how storage arrays works, their features and properties. • To understand RAID, its different configurations, and variations. • Learn about fiber channel SAN. • Learn about iSCSi SAN and how it participates in storage networks. • Learn about NAS arrays and file storage with contrast to block storage.

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Storage Devices part-1	Theory	
2	4	A1	Storage Devices part-2	Theory	Quiz1
3	4	A1	Storage Arrays: Architectural Principles,	Theory	
4	4	A1	Storage Arrays: All-Flash Arrays, Deduplication, pros and cons.	Theory	Test 1
5	4	A1	RAID: What Is RAID, RAID Groups,	Theory	Quiz2
6	4	A1	RAID: RAID Levels, and The Future of RAID.	Theory	
7	4	A1	Fiber Channel SAN: Why FC SAN, SAN Topologies,	Theory	Test 2
8	4	A1	Fiber Channel SAN: Redundancy, FC SAN.	Theory	
9	4	A1	Midterm-I	Theory	
10	4	A1	iSCSI SAN: IP Network Considerations,	Theory	
11	4	A1	iSCSI Names and Device Login Authentication	Theory	
12	4	A1	Files, NAS, and Objects: NAS Protocols,	Theory	Report
13	4	A1	NAS Arrays, Object Storage and NAS Performance	Theory	
14	4	A1	Midterm-II	Theory	
15	4	A1	Data Center Design, Data Center Overview and cabling	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Book#1: Thomas G. Robertazzi, Computer Networks and Systems: Queueing Theory and Performance Evaluation, 1st Edition, Springer-Verlag, 1990.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

وصف مقررات المرحلة الرابعة

1.	Course Name:
	اخلاقيات المهنة
2.	Course Code:
	PRET400
3.	Semester / Year:
	1st Semester / Fourth Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

6.	Number of Credit Hours (Total) / Number of Units (Total)
	2/2
7.	Course administrator's name (mention all, if more than one name)
	Name: Lect. Dr. Ammar Nema Email: Ammar_Nema@nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	14. To develop skills and understanding of professional ethics. 15. To understand profession. 16. To understand the importance of ethics in science and engineering 17. To recognize of ethical theories and applications. 18. To know the basics of ethical analyses and decision-making 19. To develop skills and understanding of channel capacity and redundancy. 20. To understand ethical leadership in engineering and society and Conflicts of interests 21. To know ethics in the workplace, Fairness (personal and social) source code construction. 22. To understand ethics in the electronic and digital age, privacy and confidentiality issue, responsible conduct of research, intellectual property and society.

9. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and group based solving problems.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1	Course introduction and overview, Morals and ethics, Comparison of ethics and engineering ethics, Ethics at personal and student level	Theory	
2	2	A1	The concept of professions: The importance of ethics in science and engineering, The role of codes of ethics, Professional responsibilities of engineers	Theory	Quiz1
3	2	A1	The concept of morality: The importance of core values, Moral/ethical dilemmas and hierarchy of moral values, Factors affecting moral responsibility, and degrees of responsibility	Theory	
4	2	A1	Overview of ethical theories and applications	Theory	Test 1
5,6	2	A1	Basics of ethical analyses and decision-making	Theory	Quiz2
7	2	A1	The importance if intention: Truth (personal and social), The concept of whistleblowing	Theory	
8	2	A1	Ethical leadership in engineering and society, Conflicts of interests	Theory	Test 2
9	2	A1	Engineers in organizations: Ethics in the workplace, Fairness (personal and social)	Theory	
10	2	A1	Specific case example – Challenger Incident	Theory	
11	2	A1	Reliability, risk and safety: Risk management, Resource allocations	Theory	
12	2	A1	Ethics in the electronic and digital age, Privacy and confidentiality issue	Theory	
13	2	A1	Responsible conduct of research, Intellectual property and society	Theory	Report
14	2	A1	Ethics and the environment, Innovation and ethics	Theory	
15	2	A1	Class summary and closure	Theory	Seminar

11. Course Evaluation

Quiz and Assignments:10

	Mid-terms Exam:30 Final Exam: 60
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	nderstanding and using English grammar, 5th edition, Betty S. Azar and Stacy A. Hagen
Main references (sources)	
Recommended books and references (scientific journals, reports…)	Fundamentals of English Grammar, 3rd edition, Betty S. Azar, 2003
Electronic References, Websites	

1. Course Name:
شبكات لاسلكية و متنقلة
2. Course Code:
WMNE402
3. Semester / Year:
1st Semester / Fourth Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Lect. Dr. Khalid W. Hameed Email: kw_sat@nahrainuniv.edu.iq
8. Course Objectives

Course Objectives	1- To understand the wireless channels models and factors affecting the type of the model. 2- To develop the knowledge about wave propagation 3- To deal with wireless networks standards in terms of network architecture and protocol stack 4- To give the basics for cellular networks and the concept of frequency reuse. 5- To Learn about short range wireless networks

9. Teaching and Learning Strategies

Strategy	Weekly lectures and lab session to ensure better understanding Quizzes and exams to ensure student learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Antennas (Definition, types, gain , directivity, pattern , S-parameters)	Theory+Lab	
2	4	A1	Propagation (modes, LOS transmission, link budged)	Theory+Lab	Quiz1
3	4	A1	Fading (Propagation mechanism / Channels types / channel models)	Theory+Lab	
4	4	A1	Spread Spectrum (DSSS / FHSS) (power and processing gain calculations)	Theory+Lab	Test 1
5	4	A1	Cellular Networks Principles (frequency reuse calculations / handover / modes)	Theory+Lab	Quiz2
6	4	A1	1st and 2nd generations (specification / network architecture / component rules)	Theory+Lab	
7	4	A1	3rd generation	Theory+Lab	Test 2
8	4	A1	4th generation (net architecture / technologies)	Theory+Lab	
9	4	A1	5th generation (net architecture / technologies)	Theory+Lab	
10	4	A1	6th generation (technologies)	Theory+Lab	
11	4	A1	LAN tech	Theory+Lab	
12	4	A1	WLAN (802.11) architecture / services / protocol stack	Theory+Lab	Report
13	4	A1	WLAN (802.11) frame structure	Theory+Lab	
14			BT(802.15) usage models, net archi, states and procedures,		
15			BT(802.15) protocol stack , frame structure		

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Text book-1: wireless communication and networking Author: William Stalling Publisher: Pearson Edition & Publication Year: 2nd Ed., 2005 Text book-2: Data & Computer Communications Author: William Stalling Publisher: Pearson Prentice Hall Edition & Publication Year: 10th Ed., 2014
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
شبكات امنية
2. Course Code:
NSEC403
3. Semester / Year:
1st Semester / Fourth Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)
5/4
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Prof. Dr. Ban Mohammed Email: ban_mohammed@nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	**1. To understand cyber security terms and technology needed.** **2. To have basic knowledge of cyber security threats, attacks and prevention techniques.** **3. To understand and have knowledge of cyber security standards and Tools.** **4. To understand OSI security protocols stack and how it works.** **5. To have the knowledge and experience to analysis security systems, firewall design and how it works.**

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	A1	Introduction: computer security, network security, internet security, Security Properties, the OSI security architecture, security threat & attacks, Security Services, Mechanisms, Model for network security.	Theory+Lab	
2	5	A1	Authentication Applications, Kerberos, Kerberos Requirements, An Overview of Kerberos, Kerberos Realms, Kerberos principal, X.509 Authentication Service.	Theory+Lab	Quiz1
3	5	A1	Digital Certificates, X.509 Certificates, Certificate Extensions, Certificate Revocation, CA Hierarchy, Authentication Procedures, Nonce, Public Key Infrastructure.	Theory+Lab	
4	5	A1	Electronic Mail Security, Email Security Enhancements, RFC 822, S/MIME (Secure/Multipurpose Internet Mail Extensions), Limitations of the SMTP/RFC822 scheme, S/MIME Certificate Processing, Pretty Good Privacy (PGP), PGP Operation	Theory+Lab	Test 1

			(Authentication, Confidentiality, Confidentiality & Authentication, Email Compatibility, and Compression), PGP operation procedure.		
5	5	A1	Cryptographic Keys and Key Rings, Key types: Symmetric, Asymmetric" Cryptography (Public/Private Key), PGP Session Keys, PGP Public & Private Keys, PGP Key Rings, The procedure to keep the private key in the private-key ring , PGP Message Generation, PGP Message Reception, PGP Message Format,	Theory+Lab	Quiz2
6	5	A1	IP security, Goals of IPSec, IPSec Architecture, IPsec operation modes (Transport and Tunnel Modes), Protocol architecture for the two modes.	Theory+Lab	
7	5	A1	Security Associations, Authentication Header (AH), Encapsulating Security Payload (ESP), Key management, Oakley, Internet Security Association & Key Management Protocol (ISAKMP), Internet key exchange (IKE) Payloads & Exchanges, Combining Security Associations.	Theory+Lab	Test 2
8	5	A1	Web security, Web Traffic Security Approaches, Secure Sockets Layer, SSL Architecture, SSL concepts, connection state OF SSL, SSL Record Protocol, SSL Record Format, SSL Handshake Protocol.	Theory+Lab	
9	5	A1	Transport Layer Security (TLS), Secure Electronic Transactions (SET), Key Features of SET, SET Process Steps, Payment Gateway Authorization.	Theory+Lab	
10	5	A1	A Comparison of Threats on the Web, Intruders, intrusion techniques, intrusion detection, Intrusion prevention, rule-based intrusion detection, Techniques for learning passwords, password management, Intrusion detection Methods, distributed intrusion detection, honey pots.	Theory+Lab	
11,12	5	A1	Malicious Software, Trojan Horse, Mobile Code, Multiple-Threat Malware, Viruses, Virus Structure, Compression Virus, Virus Classification, E-Mail Viruses, Virus Countermeasures, Methods of Antivirus, Worms, Worm Technology, Worm Countermeasures, Network Based Worm Defense, Distributed Denial of Service Attacks, DDoS Countermeasures, Digital Immune System, Behavior-Blocking Software.	Theory+Lab	
13	5	A1	Firewall, design principles, Firewall capability, Firewall Limitations, Types	Theory+Lab	Report

			of firewalls, packet filters, Attacks on Packet Filters, Stateful Packet Filters, Application Level Gateway (Proxy), Circuit Level Gateway, Firewall rule contents, Comparisons of Firewall, Host-Based Firewalls, Personal Firewalls, Firewall Configurations, Distributed Firewalls, DMZ Networks, Virtual Private Networks.		
14	5	A1	Cryptography, Cryptography capability, the strength of ciphers, cryptographic system components, RSA Algorithm, Generation Keys of RSA, RSA Encryption and Decryption.	Theory+Lab	
15	5		Final Exam		

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Text book1: William Stallings, "Cryptography and Network Security; Principles and Practice" , 5 th Edition, 2010. Textbook2: Joseph Migga Kizza, "Guide to Computer Network Security" , Springer, 4th Edition , 2017.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
الحوسبة السحابية
2. Course Code:
CLCP405
3. Semester / Year:
1st Semester / Fourth Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Lect. Dr. Salim A. Mohammed Ali Email: salimm @nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	**1. To understand the main terminologies and new techniques used in Cloud Computing.** **2. To learn about the different types of Cloud Computing.** **3. To learn how to design and establish a small Cloud computing system.** **4. To learn about the current programming and scripting technique that are used in Cloud computing services.** **5. To obtain knowledge of how to scale cloud servers vertically and horizontally.**

9. Teaching and Learning Strategies

Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in lecture discussions and tutorial sessions, while at the same

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	The Era of Cloud Computing: The Motivations for Cloud, Power wall, Racks of Server Computer, Elastic Computing, Multi-tenant Clouds, IaaS, PaaS, SaaS, and DaaS.	Theory	
2	4	A1	Types of Clouds and its Providers: Private and Public Cloud, Provider Lock-in, Hybrid Cloud, Multi-Cloud, Hyperscale.	Theory	Quiz1
3	4	A1	Data Center Infrastructure and Equipment: Racks, Aisles, and Pods, Power and Cooling, Network Equipment, North-South and East-West Network Traffic, Fat tree Design, leaf spine scaling, Unified Data Centers Network.	Theory	
4	4	A1	Virtual Machines and Containers: Approaches To virtualization, Properties of Virtualization, Level of Trust and I/O devices, VM Migration, Hypervisor. Container approach, Docker Containers, Docker software components.	Theory	Test 1
5	4	A1	Virtual Networks and Virtual Storage: Virtual Networks, Overlay and Underlays, VLANs, VXLAN, Virtual Network Switch, NAT, Mobility, SDN, The OpenFlow Protocol, Programmable Networks. Local and Remote Storage, NAS, SAN, Object Storage.	Theory	Quiz2
6	4	A1	Cloud Automation and Orchestration: The need of Automation, Level of Automation, Use of ML and AI, Automation Tools, Zero Touching Provision. Kubernetes Scope, Kubernetes Cluster and Pods, Init Containers, Control Plane Software and Communication, Worker Node Software.	Theory	
7	4	A1	The Map Reduce Paradigm: Cloud native vs. Conventional Software, Parallel Processing, MapReduce Programming Paradigm, Math of MapReduce, Apache Hadoop, HDFS, Hadoop support for Programming languages.	Theory	Test 2
8	4	A1	Microservices: Monolithic Apps in Data Centers, The Microservices Approach: Pros and Cons, Microservices	Theory	

			Granularity, Communication Protocols for Microservices, Servie Mesh Proxy, Microservices Technologies.		
9	4	A1	Controller-Based Management Software: Traditional Distributed Applications Management, Periodic Monitoring, Managing Cloud-Native Applications, Control Loop Concept, Kubernetes and Control Loop, CRD, Reactive and Dynamic Planning.	Theory	
10	4	A1	Serverless Computing and DevOps: The serverless Computing Approach, Stateless Servers and Containers, Serverless Infrastructure, An Example of Serversles Processing. DevOps Approach, Continuous Integration, Continuous Delivery, Caucious Deployment, Sandbox, Canary, and Blue/Green.	Theory	
11	4	A1	Edge Computing and IoT: The Latency Disadvantage of Cloud, Low Latency Needs, Extending Edge to A Fog Hierarchy, Multi-level Caching, Edge computing and IIoT, Communication of IIoT, Decentralization.	Theory	
12	4	A1	Cloud Security and Privacy: Cloud Security Problems, Traditional Security Methods and its insufficiency with cloud, Zero Trust Security Model, Identity Management, PAM, AI and Security, Protecting Remote Access, Privacy in Cloud, Back Doors, Side Channels.	Theory	Project
13	4	A1	Controlling Complexity of Cloud-Native Systems: Sources of Complexity in Cloud, Inherent Complexity, Designing a Flawless Distributed System, System Modeling, Mathematical Models, Graph Model, TLA+ Specification, State Transitions, Temporal Logic Models.	Theory	
14	4		Building Your Own Cloud: Case Study, see TextBook#2	Theory	
15	4		**Building Your Own SaaS:** Case Study, see TextBook#2	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Book#1: Douglas E. Comer, The Cloud Computing Book, The future of Computing Explained, 1st Edition, CRC Press, 2021. Book#2: Ian Foster and Dennis B. Gannon, "Cloud Computing for Science and Engineering", The MIT Press, 2017.
Main references (sources)	

Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:	
تطبيقات الموبايل	
2. Course Code:	
MAPP407	
3. Semester / Year:	
1st Semester / Fourth Year	
4. Description Preparation Date:	
5-5-2025	
5. Available Attendance Forms:	

6. Number of Credit Hours (Total) / Number of Units (Total)	
4/3	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist. Lect. Saad B. Yonis Email: saad_badie @nahrainuniv.edu.iq	
8. Course Objectives	
Course Objectives	1. The course aims to equip students with practical skills by engaging them in hands-on development projects. 2. Students will learn to design, and develop mobile applications using industry-standard tools and technologies. 3. Emphasis will be placed on building functional and user-friendly applications. 4. The course aims to familiarize students with cross-platform development frameworks and techniques.

	5. Students will learn how to develop applications that can run on multiple platforms, such as iOS and Android, using frameworks like Flutter. **6**. This will enable them to maximize their reach and minimize development efforts.

9. Teaching and Learning Strategies

Strategy	**several strategies can be employed to enhance student learning and engagement. One effective strategy is to adopt a project-based learning approach, where students actively work on hands-on development projects throughout the course. By tackling real-world mobile app projects, either individually or in teams, students can apply their knowledge and skills in a practical setting. Providing guidance, feedback, and regular milestones ensures that students make progress and achieve the desired learning outcomes.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Mobile applications history and types, mobile development platforms.	Theory+Lab	
2	4	A1	Introduction to Flutter and its anatomy	Theory+Lab	Quiz1
3	4	A1	The Anatomy of a Flutter App,	Theory+Lab	
4	4	A1	Hot Reload and hot restart	Theory+Lab	Test 1
5	4	A1	data types and variables	Theory+Lab	Quiz2
6	4	A1	Mid-Term Exam 1	Theory+Lab	
7	4	A1	The Function and how to use it	Theory+Lab	Test 2
8	4	A1	ISS setState?	Theory+Lab	
9	4	A1	widget lifecycle	Theory+Lab	
10-11	4	A1	API and API Examples.	Theory+Lab	
12	4	A1	Mid-Term Exam 2	Theory+Lab	
13-14	4	A1	JSON and Examples	Theory+Lab	Project
15	4	A1	Async/Await	Theory+Lab	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Marco L. Napoli, Beginning Flutter: A Hands on Guide to App Development, Wiley, 2019
Main references (sources)	
Recommended books and references (scientific journals, reports…)	

Electronic References, Websites	, https://www.wiley.com/en-us/Beginning+Flutter%3A+A+Hands+On+Guide+to+App+Development-p-9781119550822

1. Course Name:
اللغة الانكليزية 4
2. Course Code:
ENGL450
3. Semester / Year:
2nd Semester / Fourth Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )												رقم الأسبوع ( )
												اسم المادة
												عدد الساعات
												اسم التدريسي + التوقيع+ التاريخ
												اسم الطالب

6. Number of Credit Hours (Total) / Number of Units (Total)
2/2
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Prof. Dr. Raghad Shakir Email: Raghad_Shakir@nahrainuniv.edu.iq

8. Course Objectives	
Course Objectives	**1. To provide students with essential information in English language in association with reading, writing and speaking skills, and knowing more English vocabulary.** **2. To understand sentences, tenses, and practicing writing.** **3. To enhance students' English language competencies along with their technical or professional knowledge.** **4. To enhancing students' communication skills in English can result in better job opportunities in the future**

9. Teaching and Learning Strategies	
Strategy	The main strategies that will be adopted in delivering this module are: - Allow students to actively participate in the learning process with class discussions and exercises that support the initiative. - Use didactic questioning through questions to determine student understanding of the material.

	Writing an assignment and report that encourages students to clarify and organize their thinking and independently research and present on a topic.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	A1	An Approach to Academic Writing	Theory	
2	2	A1	General-Specific and Specific-General Texts	Theory	Quiz1
3	2	A1	Problem, Process, and Solution	Theory	
4	2	A1	Abstract	Theory	Test 1
5	2	A1	Paraphrasing	Theory	Quiz2
6	2	A1	Research Report	Theory	
7	2	A1	Research Proposal	Theory	Test 2
8	2	A1	MID EXAM I	Theory	
9	2	A1	Writing Summaries	Theory	
10	2	A1	Results and conclusions	Theory	
11	2	A1	Annotated Bibliography	Theory	
12	2	A1	Various Disciplines and Topics: Personal statements, scientific reports, discussion board postings, in-class essays, literature reviews, business genres, PowerPoint presentations, personal statements, and introductions and conclusions	Theory	Report
13	2	A1	Presentation slides	Theory	
14	2	A1	Presentation slides	Theory	Seminar
15	2	A1	MID EXAM II	Theory	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	cademic Writing for Graduate Students, 3rd Edition: Essential Skills and Tasks John M. Swales & Christine B. Feak
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1.	Course Name:
	تقنيات الشبكات الحديثة
2.	Course Code:
	MNTN451
3.	Semester / Year:
	1st Semester / Fourth Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	3/3
7.	Course administrator's name (mention all, if more than one name)
	Name: Lect. Dr. Salim A. Mohammed Ali Email: salimm@nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	23. To boost students' knowledge in Modern computer networks and telecommunications technologies. 24. To learn about new technologies regrading IoT and vehicles communication. 25. To enrich students' knowledge of how SDN works. 26. To introduce about Quantum Networks and Blockchain Technology. 27. To introduce the students to new satellite systems and optical Networks. 28. To learn about next generation networks and 6G mobile networks. 29. To enrich students of new emergent technologies.
9.	Teaching and Learning Strategies
Strategy	The main strategy that will be adopted in delivering this module is to encourage students' participation in lecture discussions and tutorial sessions, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
10.	Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	A1	Orthogonal Frequency Division Multiplexing (OFDM) System:	Theory	
2	3	A1	Elements of an OFDM system, Comparison with single carrier system, Main advantages, Performance in real channel environments, Cyclic prefix and Equalization, Applications in WLAN standards, Design consideration and limitations	Theory	Quiz1
3	3	A1	Advanced Coding Techniques: Convolutional Codes (structure and applications in network standards)	Theory	
4	3	A1	Virtualization Technology: Benefits of VM's, How Virtualization works, Hypervisors (VMWare, KVM, and Others), Types of Hypervisors, Hypervisor Vendors, Choosing a Hypervisor	Theory	Test 1
5	3	A1	Software Defined Network (SDN): Motivation, How SDN works, Understanding SDN, SDN Architecture, SDN controllers, Openflow protocol, SDN development tools.	Theory	Quiz2
6	3	A1	Cellular Packet-Switched Architecture:	Theory	
7	3	A1	The wireless data services (cellular digital packet data, advanced radio data information systems). Trunk interface unit, wireless terminal interface, Base station Interface unit, Cellular controller interface unit.	Theory	Test 2
8	3	A1	Cellular Networks: Business Wireless Data Networks, Cellular Data Networks, All-IP Architecture: Networking Elements, Components of the UMTS Network.	Theory	
9	3	A1	Satellite Systems: Introduction, Applications, A Typical satellite system, Types of Satellite Systems, Satellite parameters, Transmission Impairments, Power Delay Profile: Statistics.	Theory	
10	3	A1	Digital Subscriber Line Technology	Theory	
11	3	A1	The plain old telephone networks, The local loop, Spectrum of digital subscriber loop (DSL), Channel characteristics, Main DSL system elements. Modulation techniques in DSL, Types and features of DSL systems, DSL based networks	Theory	
12	3	A1	Optical Networks	Theory	Project
13	3	A1	Wavelength-Division Multiplexed (WDM) System Components, WDM	Theory	

			system design, Trunk Capacity. WDM networking and Reconfigurable Optical transport layer, DWDM Technology, Wireless optical networks		
14	3		Virtual Private Network (VPN): Overview, how does it works? why is a VPN, How to choose the right VPN service, What options are available to connect to a VPN?	Theory	
15	3		5G and beyond Networks	Theory	

11. Course Evaluation
Quiz and Assignments:10 Mid-terms Exam:30 Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Textbook-1: James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach", Pearson, 7th Edition, 2017. Textbook-2: Rapapport, "The wireless communications, principles and practices", Edition/Publisher / 2002 /Prentice Hall. Textbook-3: Jim Doherty, "SDN and NFV Simplified: A Visual Guide to Understanding Software Defined Networks and Network Function Virtualization", Pearson Education, Inc, 2016. Textbook-4: T. Anttalainen, "Introduction to Telecommunication Networks Engineering", 2nd Edition, Artech House, 2003.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
ادارة الشبكات
2. Course Code:
NMGT453
3. Semester / Year:
2nd Semester / Fourth Year

4. Description Preparation Date:

5-5-2025

5. Available Attendance Forms:

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

5/4

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

Name: Lect. Dr. Salim A. Mohammed Ali
Email: salimm@nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	30. To understand the role and components of network management systems, including their significance in ITIL Service Operation. 31. To comprehend the basics of Simple Network Management Protocol (SNMP) and the structure of Management Information Bases (MIBs) in network management. 32. To gain practical knowledge of fault management techniques, including identifying and troubleshooting network faults, utilizing fault management tools, and performing root cause analysis. 33. To develop skills in performance management, including monitoring and optimizing network performance, utilizing performance management tools, and managing Quality of Service (QoS). 34. To acquire knowledge of network security management, including security policies, best practices, security monitoring, and incident response. 35. To explore Authentication, Authorization, and Accounting (AAA) concepts in network management, including RADIUS for AAA and managing user authentication, access control, and accounting. To understand the principles of network automation and orchestration, including infrastructure-as-code, orchestration frameworks, and their application in network management.

9. Teaching and Learning Strategies

Strategy	The main strategy employed in delivering the Network Management course is to foster active student participation and enhance critical thinking skills. This will be achieved through interactive classes, practical experiments, group work, and discussions. By encouraging students to actively engage with the course material, ask questions, and participate in problem-solving activities, they will develop a deeper understanding of network management principles and techniques. The incorporation of critical thinking exercises and the utilization of multimedia resources further enhance the learning experience. Through these strategies, students will not only gain theoretical knowledge but also have the opportunity to apply it in real-world scenarios, refining

	their critical thinking abilities and fostering a collaborative learning environment. Continuous assessments and feedback will ensure that students can monitor their progress and identify areas for improvement. Ultimately, this approach aims to equip students with the necessary skills and knowledge to effectively manage computer networks and adapt to the evolving demands of the field.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5	A1	Introduction to course layout. Introduction to Network Management: Goals, organization, functions and components	Theory+Lab	
2	5	A1	Basic foundations: Standards, models, language, Architecture of NMSs, SNMP, SMI, and MIB data model	Theory+Lab	Quiz1
3	5	A1	SNMP versions, MIBs, MIB file structure and writing MIBs with ASN.1	Theory+Lab	
4	5	A1	Encoding Rules, BER, SNMP Messages, SNMP Message encoding, syslog	Theory+Lab	Test 1
5	5	A1	Midterm Exam 1	Theory+Lab	Quiz2
6	5	A1	Network management tools and systems: System utilities for management, & measurement.	Theory+Lab	
7	5	A1	Network management applications: Configuration ,fault , security and accounting.	Theory+Lab	Test 2
8	5	A1	Authentication, Authorization, and Accounting (AAA) Management, RADIUS for AAA	Theory+Lab	
9	5	A1	Midterm Exam 2	Theory+Lab	
10	5	A1	Web-based management, Desktop management interface,	Theory+Lab	
11,12	5	A1	Netconf and YANG	Theory+Lab	
13	5	A1	Broadband network management, Performance management, Service Level Agreements (SLAs), Flow data and analysis	Theory+Lab	Report
14	5	A1	Network Task Automation, Autonomous Network Management	Theory+Lab	
15	5		Final Exam		

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Text Book-1: Network Management: Principles and Practice Author: Mani Subramnian

	Edition/Year/ Publisher: 2nd , 2010, Pearson Text Book-2: Advances in Network Management, Auerbach Publication, Author: Jianguo Ding 2009, ISBN-10: 1420064525, ISBN-13: 978-1420064520
Main references (sources)	References: Alexander Clemm, Network Management Fundamentals, Cisco Press (2007), ISBN 1-58720-137-2
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1.	Course Name:
	تصميم الشبكات
2.	Course Code:
	NE423
3.	Semester / Year:
	2nd Semester / Fourth Year
4.	Description Preparation Date:
	5-5-2025
5.	Available Attendance Forms:

استمارة حضور اسبوعية للطلبة الفصل ( ) ٢٠٢٤/٢٠٢٥ المرحلة ( )											رقم الأسبوع ( )
											اسم المادة
											عدد الساعات
											اسم التدريسي + التوقيع+ التاريخ
											اسم الطالب

6.	Number of Credit Hours (Total) / Number of Units (Total)
	4/3
7.	Course administrator's name (mention all, if more than one name)
	Name: Assist. Lect. Saad B. Yonis Email: saad_badie @nahrainuniv.edu.iq
8.	Course Objectives

Course Objectives	1.	To learn about Network design methodology.
	2.	To understand the network design models used in recent network design approach.

	3. To understand how enterprise LAN is designed. 4. To understand datacenter design and how datacenters use design criteria. 5. Learn about wireless LAN design. 6. Learn WAN design, how the Internet is designed and how connect enterprises to the Internet. 7. Learn about Internet routing designs. **8.** Lean how to design secured networks using best practices.

9. Teaching and Learning Strategies

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

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	Network Design Methodology	Theory+Lab	
2	4	A1	Network Design Models part- I	Theory+Lab	Quiz1
3	4	A1	Network Design Models part- II	Theory+Lab	
4	4	A1	Enterprise LAN Design part - I	Theory+Lab	Test 1
5	4	A1	Enterprise LAN Design part - II	Theory+Lab	Quiz2
6	4	A1	Data Center Design part- I	Theory+Lab	
7	4	A1	Data Center Design part -II	Theory+Lab	Test 2
8	4	A1	Wireless LAN Design part - I	Theory+Lab	
9	4	A1	Wireless LAN Design part - II	Theory+Lab	
10-11	4	A1	WAN Design part- I	Theory+Lab	
12	4	A1	WAN Design part-II	Theory+Lab	
13-14	4	A1	The Internet Protocol and Routing Protocols part - I	Theory+Lab	Project
15	4	A1	The Internet Protocol and Routing Protocols part - II	Theory+Lab	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Text book: CCDA 200-310 Official Cert Guide Fifth Edition, Authors : Anthony Bruno, Steve Jordan, Pearson education - 2017
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
شبكات الوسائط المتعددة
2. Course Code:
MULN457
3. Semester / Year:
2nd Semester / Fourth Year
4. Description Preparation Date:
5-5-2025
5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)
4/3
7. Course administrator's name (mention all, if more than one name)
Name: Assist. Lect. Mohammed Ammar Email: mohammed_ammar @nahrainuniv.edu.iq

8. Course Objectives

Course Objectives	1. To learn about Network design methodology. 2. To understand the network design models used in recent network design approach. 3. To understand how enterprise LAN is designed. 4. To understand datacenter design and how datacenters use design criteria. 5. Learn about wireless LAN design. 6. Learn WAN design, how the Internet is designed and how connect enterprises to the Internet. 7. Learn about Internet routing designs. 8. Lean how to design secured networks using best practices.

9. Teaching and Learning Strategies

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

	critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	A1	**Introduction:** Types of Networks , Internet , Telecommunication Provider Networks , Company Networks , University Networks , Home Networks , Overview . Standard Organizations	Theory+Lab	
2	4	A1	**Requirements:** Telephony , Streaming, IPTV 11, High-End Videoconferences, Webcast.	Theory+Lab	Quiz1
3, 4	4	A1	**Audio, Image, Video Coding, and Transmission:** Audio: Companding, Differential Quantization, Vocoders. Basics of Video Coding: Simple Compression, Motion Estimation. JPEG, MPEG/H.26x Video Compression, MPEG Data Streams, H.261, MPEG-4, H.264, Scalable Video Codec, H.265.	Theory+Lab	
5,6	4	A1	**Underlying Network Functions:** Real-Time Protocol (RTP), Elements of RTP, Details of RTP, RTP Payload, Details of RTCP. Session Description Protocol (SDP): SDP Overview, Extending SDP, Javascript Session Establishment Protocol (JSEP). Streaming:Real-Time Streaming Protocol (RTSP).	Theory+Lab	Test 1
7,8	4	A1	**Multicast:** Multicast Overview, Multicast Addressing, Types of Multicast, Multicast End Delivery, Multicast Routing Protocols, Protocol Independent Multicast – Sparse Mode, Application Layer Multicast. Quality of Service: Integrated Services (Intserv), Resource Reservation Protocol (RSVP), Differentiated Services (DiffServ), QoS on the LAN, QoS in the Real World. NTP.Caching: Caching Elements, web Cache Communications Protocol (WCCP), Content Delivery Networks, Use of Cache Servers in Private Networks.	Theory+Lab	Quiz2

9,10	4	A1	**Synchronization and Adaptation:** End-to-End Model, Jitter, Packet Loss, Play-Out Time, hypothetical Decoder, Multiple Streams, Adaptive Play-Out, Congestion Control, Delay, Queuing, Media Player, Storage and Retrieval, Integration Scripting Languages, Optimization.	Theory+Lab	
11,12	4	A1	**Session Initiation Protocol:** SIP Basics, First Steps with SIP, SIP Servers, More SIP Methods. PSTN Interconnection, Conferencing, Presence, Network Address Translation, APIs and Scripting, Security and Safety, Planning a VoIP Company Telephony System, Dial Plan, Emergency, VoIP Network Planning.	Theory+Lab	Test 2
13,14	4	A1	**Other Standard VoIP Protocols:** H.323 VoIP Family, H.225, H.245, Comparing SIP and H.323, T.120 Data Applications, Gateway Control, H.248, Signal Control, Mobile VoIP, IP Multimedia Subsystem, VoLTE, Skype.	Theory+Lab	
15	4	A1	Exam	Theory+Lab	

11. Course Evaluation

Quiz and Assignments:10
Mid-terms Exam:30
Final Exam: 60

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Text book1: Hans W. Barz and Gregory A. Bassett, "MULTIMEDIA NETWORKS PROTOCOLS, DESIGN, AND APPLICATIONS", © 2016 John Wiley and Sons Ltd
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	