



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

دليل وصف البرنامج الأكاديمي والمقرر الدراسي

2025/2026

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 اكتسابها للطلبة مبنية على وفق أهداف 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 م 2906/3 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 الأكاديمية والمقررات الدراسية لضمان حسن سير العملية التعليمية.

مفاهيم ومصطلحات:

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

وصف المقرر: يوفر إيجازاً مقتضباً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنًا 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.

أهداف 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 أهداف 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 ..ديالى.....
الكلية/ المعهد: كلية .. العلوم.....
القسم العلمي: قسم .. علوم الحاسوب.....
اسم البرنامج الأكاديمي او المهني: بكالوريوس . علوم حاسوب/حاسبات – علوم حاسوب/أمن
سيبراني – علوم حاسوب /معلوماتية طبية
اسم الشهادة النهائية: بكالوريوس في .. علوم حاسوب/حاسبات – علوم حاسوب/أمن سيبراني
– علوم حاسوب /معلوماتية طبية

النظام الدراسي: المرحلة الرابعة \ فصلي
المراحل : الأول والثاني والثالث: مسار بولونيا
تاريخ اعداد الوصف: 2025/9/10
تاريخ ملء الملف: 2025/9/10


التوقيع :
اسم معاون القسم: أ.د. منذر حمزة راضي
التاريخ : 2025/9/11


اسم رئيس القسم: أ.د. بشار طالب حميد
التاريخ : 2025/9/11

دقق الملف من قبل
شعبة ضمان الجودة والأداء الجامعي
اسم مدير شعبة ضمان الجودة والأداء الجامعي: أ.م. غسان صبيح محمود
التاريخ
التوقيع


مصادقة السيد العميد
أ.د. طه محمد حسن

1. رؤية البرنامج

ان رؤية قسم علوم الحاسوب هي جزء من رؤية كلية العلوم ورؤية جامعة ديالى والتي يطمح فيها القسم الى تهيئة واعداد مبرمجين بنوعية ومستوى رفيع ومتميز ولديهم خلفية علمية وعملية تضم المعرفة والمهارات المطلوبة لغرض تزويد المجتمع بجيل يستطيع حل المشكلات البرمجية والحاسوبية خاصة في ظل التطور العالمي المتسارع في هذا المجال. أن رؤيا القسم تشمل أيضا الكادر التدريسي والاهتمام به لكي يقدم مستوى تدريسي وبحثي يوازي التدريس والنشر العالمي. كما تشمل رؤيا القسم تطوير المناهج الدراسية في ضوء الاتجاهات العالمية المعاصرة وإخضاعها للتقويم الدوري وفقاً للمعايير العالمية مع مراعاة الظروف المحلية.

2. رسالة البرنامج

الرسالة: إن رسالة القسم هي جزء مكمل لرسالة كلية العلوم وجامعة ديالى والتي تسعى الى تعريف المجتمع بعلم الحاسوب والمعلومات الطبية والامن السيبراني من خلال ربط هذه العلوم بالتطبيق العملي. ورسالة القسم تسعى جاهدة الى حل المعضلات في ميادين مختلفة كالصناعة والزراعة والصحة والبيئة وغيرها إضافة إلى فتح آفاق تعاون مع المؤسسات الحكومية المختلفة الخدمية والأكاديمية للوقوف على الحاجة الفعلية لمحافظة ديالى والعراق من البحوث المواكبة للتطور العلمي والتقني على الصعيد الدولي.

3. اهداف البرنامج

الأهداف: يهدف قسم علوم الحاسوب ضمن توجهات كلية العلوم الى تعليم لغات برمجية وأنظمة تشغيل وبيئات ومعارف في علم الحاسوب و الامن السيبراني و المعلومات الطبية. وهي تهدف إلى خدمة المجتمع وبرامج الجامعة.

ان الهدف العام لهيئة تدريس علوم الحاسوب هو تنفيذ تخصص علوم الحاسوب والامن السيبراني و المعلوماتية الطبية بنجاح. ومن أجل القيام بذلك، لابد ان تكون لهيئة التدريس أهداف تتمثل بما يلي:

1. تزويد الطلاب بالمعرفة والفهم للمبادئ والتقنيات الأساسية التي تدعم تخصص الحاسوب والامن السيبراني و المعلومات الطبية.
2. منح الطلاب الخبرة الفنية في علوم الحاسوب المختلفة والخبرة العملية التي تمكنهم من أن يكونوا فعالين في مجموعة متنوعة من المهن في مجال الحاسوب والامن السيبراني والمعلومات الطبية.
3. تزويد الطلاب بالمعرفة والاستخدام العملي لأدوات وتقنيات الصناعة لتطوير تطبيقات البرمجيات الحاسوبية والطبية و الامنية.
4. توفير بيئة محفزة وشاملة مع فرصة لتطوير أنفسهم فكريًا واجتماعيًا وتشجيع الطلاب على التطور كحلول مشكلات مستقلة ومنتقدة ذاتيًا.
5. اعداد الطلاب لمواصلة الدراسة على مستوى متقدم، إما في الدراسات العليا الرسمية أو كتطوير مهني مستمر..
6. اعتماد النظام الدراسي والمناهج الدراسية التي تحقق المستوى العلمي الرصين الذي تتميز به الاقسام العالمية المناظرة، واعتماد طرائق ووسائل ومصادر التعلم الحديثة.
7. تنفيذ البرامج التعليمية والتربوية التي تدعم الثقة بالنفس وتطور القدرات الذهنية وتحفز الطموح لتحقيق النجاح في الحياة الشخصية والعملية.
8. تنظيم النشاطات اللاصفية التي تسهم في تطوير وتنمية شخصية الطالب. وتعزيز المبادئ الأخلاقية الفاضلة وتنمية الشعور بالمسؤولية وروح التعاون، والمساهمة في خدمة المجتمع.
9. تفعيل دور التعليم المستمر في تطوير قدرات ومهارات الكادر التدريسي في القسم، لتحقيق التواصل مع مؤسسات المجتمع وسوق العمل.

4. الاعتماد البرامجي

هل البرنامج حاصل على الاعتماد البرامجي ؟ ومن اي جهة ؟ كلا

5. المؤثرات الخارجية الأخرى

هل هناك جهة راعية للبرنامج ؟ كلا

6. هيكلية البرنامج				
هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات *
متطلبات المؤسسة	6	12		
متطلبات الكلية	---	----		
متطلبات القسم	78	463		
التدريب الصيفي				
أخرى				

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

7-وصف البرنامج

قسم علوم الحاسوب

التخصص العام : علوم الحاسوب		كلية العلوم	
ت	عنوان التخصص الفرعي الدقيق	توصيف شهادة التخرج	الوصف الوظيفي للطلاب المخرج
1	علوم الحاسوب	بكالوريوس علوم الحاسوب	م. مبرمج
2	علوم الحاسوب	بكالوريوس علوم الحاسوب/الامن السيبراني	م. مبرمج امني
3	علوم الحاسوب	بكالوريوس علوم الحاسوب/ المعلومات الطبية	م. مبرمج طبي

المرحلة الأولى / الفصل الأول (مسار بولونيا)

Subject	العملي	المناقشة	النظري	عدد الوحدات	الرمز	المادة الدراسية
Differentiation Methods	---	1	3	5.00	SCI-101	طرائق التفاضل
Introduction to Programming	4	----	3	8.00	COM-111	مقدمة الى البرمجة
Computational mathematics	--	1	3	5.00	COM-112	رياضيات حاسوبية
Computer Skills	2	----	2	4.00	COM-113	مهارات الحاسوب
Digital Logic	2	----	3	6.00	COM-114	تصميم منطقي
English Language	----	----	2	2.00	UD-101	اللغة الانكليزية
	8	2	16	30	----	المجموع

المرحلة الاولى – الفصل الثاني (مسار بولونيا)

Subject	العملي	المناقشة	النظري	عدد الوحدات	الرمز	المادة الدراسية
Integration Methods		1	3	6.00	SCI-102	طرائق التكامل
Programming Fundamentals	4	----	3	8.00	COM-121	أساسيات البرمجة
Discrete Structures	--	1	2	6.00	COM-122	هياكل متقطعة
Computer Organization	2	----	3	6.00	COM-123	تركيب الحاسوب
Human Rights and democracy	----	----	2	2.00	UD-102	حقوق الانسان والديمقراطية
Arabic Language	----	----	2	2.00	UD-103	اللغة العربية
Sum	8	2	17	30	----	المجموع

المرحلة الثانية – الفصل الثاني(مسار بولونيا)

Subject	العملي	المناقشة	النظري	عدد الوحدات	الرمز	المادة الدراسية
Introduction to Object Oriented Language	2	----	3	7.00	COM-211	مقدمة الى لغة الكيانات
Data Structures	2	----	3	6.00	COM-212	هياكل بيانات
Computation Theory	-	1	3	4.00	COM-213	نظرية احتسابية
Web Design and Programming	2	----	3	6.00	COM-214	تصميم و برمجة الويب
Numerical Methods	2	----	3	5.00	SCI-201	طرائق عددية
Baath Party Crimes in Iraq	----	----	3	2.00	UD-201	جرائم البعث
Sum	8	1	18	30	----	المجموع

المرحلة الثانية – الفصل الثاني(مسار بولونيا)

Subject	العملي	المناقشة	النظري	عدد الوحدات	الرمز	المادة الدراسية
Algorithms Design and Analysis	2	----	2	5.00	COM-221	تصميم وتحليل الخوارزميات
Computer Graphics	2	----	2	6.00	COM-222	رسوم الحاسوب
Computer Architecture	----	1	3	4.00	COM-223	معمارية الحاسوب
Python	2	----	2	6.00	COM-224	بايثون
Object Oriented Programming	2	----	2	5.00	COM-225	برمجة كائنية
Arabic Language2	-	-	2	2.00	UD-202	لغة عربية 2
English Language	-	-	2	2.00	UD-203	لغة إنكليزية 2
Sum	8	1	15	30	----	المجموع

المرحلة الثالثة (فرع علوم الحاسوب) مسار بولونيا – الفصل الأول

Subject	العملي	المناقشة	النظري	عدد الوحدات	الرمز	المادة الدراسية
Language Translator	2		2	5.00	COM-311	مترجم لغة
Artificial Intelligence	2		2	6.00	COM-312	ذكاء اصطناعي
Cryptography	2		2	6.00	COM-313	تشفير
Digital Image Processing	2		2	6.00	COM-314	معالجة صورة رقمية
Introduction to Database	2		2	5.00	COM-315	مقدمة الى قواعد البيانات
Research Methodology			2	2.00	COM-316	منهجية البحث
Sum	10	-	12	30	----	المجموع

المرحلة الثالثة (فرع علوم الحاسوب) مسار بولونيا – الفصل الثاني

Subject	العملي	المناقشة	النظري	عدد الوحدات	الرمز	المادة الدراسية
Software Engineering	2		2	4.00	COM-321	هندسة برامجيات
Web applications Development	2		2	6.00	COM-322	تطوير تطبيقات الويب
Computer Security	2		2	6.00	COM-323	أمنية الحاسوب
Knowledge Representation	-		2	4.00	COM-324	تمثيل معرفة
Distributed Database	2		2	5.00	COM-325	قواعد بيانات موزعة
Pattern Recognition	-		2	5.00	COM-326	تمييز الأنماط
Sum	8	-	12	30	----	المجموع

المرحلة الثالثة (فرع الامن السيبراني) مسار بولونيا – الفصل الاول

Subject	العملي	المناقشة	النظري	عدد الوحدات	الرمز	المادة الدراسية
Fundamentals of Cyber Security	2	---	2	6.00	CYB-311	اساسيات الامن السيبراني
Digital Image Processing	2		2	6.00	COM-314	معالجة صورة رقمية
Cryptography	2		2	6.00	COM-313	تشفير
Security of Social Media	2	-	2	4.00	CYB-312	أمن التواصل الاجتماعي
Artificial Intelligence	2		2	6.00	COM-312	ذكاء اصطناعي
Research Methodology	---		2	2.00	COM-316	منهجية البحث
Sum	10		12	30	----	المجموع

المرحلة الثالثة (فرع الامن السيبراني) مسار بولونيا – الفصل الثاني

Subject	العملي	المناقشة	النظري	عدد الوحدات	الرمز	المادة الدراسية
Digital Signal Processing	--	--	2	6.00	COM-321	معالجة الإشارة الرقمية
Computer Network	2	-	2	6.00	COM-322	شبكات الحاسوب
Pattern Recognition	-	-	2	5.00	COM-326	تمييز الأنماط
Cybersecurity Platforms	2		2	4.00	CYB-321	منصات الامن السيبراني
Software Applications	2	-	1	3.00	CYB-324	تطبيقات برمجية (امنية)
Web applications Development	2	-	2	6.00	COM-322	تطوير تطبيقات الويب
Sum	8		11	30	----	المجموع

المرحلة الثالثة (فرع المعلوماتية الطبية) مسار بولونيا – الفصل الثاني

Subject	العملي	المناقشة	النظري	عدد الوحدات	الرمز	المادة الدراسية
Digital Image Processing	2		2	6.00	COM-314	معالجة صورة رقمية
Artificial Intelligence	2		2	6.00	COM-312	ذكاء اصطناعي
Medical Informatics Technology	--		2	6.00	MED-311	تقنية المعلومات الطبية
Medical Devices	2		2	5.00	MED-312	الأجهزة الطبية
Electronic patient records	2		2	5.00	MED-313	سجلات المريض الالكترونية
Research Methodology	--		2	2.00	COM-316	منهجية البحث
Sum	8		12	30	----	المجموع

المرحلة الثالثة (فرع المعلوماتية الطبية) مسار بولونيا – الفصل الثاني

Subject	العملي	المناقشة	النظري	عدد الوحدات	الرمز	المادة الدراسية
Digital Signal Processing	--	--	2	6.00	COM-321	معالجة الإشارة الرقمية
Software Applications	2	-	1	3.00	MED-321	تطبيقات برمجية (طبية)
Pathological physiology	-		2	6.00	MED-322	علم وظائف الاعضاء الباثولوجي
Pattern Recognition	-		2	5.00	COM-326	تمييز الأنماط
Medical Documentation	2		2	5.00	MED-323	التوثيق الطبي
Computational Biology	-		2	5.00	MED-324	علم الأحياء الحسابي
Sum	4		11	30	----	المجموع

المرحلة الرابعة (علوم حاسبات /فصلي) (مسار بولونيا) – الفصل الأول

Subject	المادة الدراسية	الرمز	عدد الوحدات	النظري	المناقشة	العملي
Computer Operating Systems	نظم تشغيل الحاسوب	COM-411	5.00	2	----	2
Computer Networks	شبكات الحاسوب	COM-412	5.00	2	----	2
Machine Learning	تعلم الماكينة	COM-413	5.00	2	----	2
Multimedia Systems	أنظمة متعدد الوسائط	COM-414	4.00	3	----	----
Coding and Data Compression	الترميز وضغط البيانات	COM-415	4.00	2	----	----
Mobile Computing	الأحساب المتنقل	COM-416	4.00	3	----	----
Graduate Project (I)	مشروع بحث (I)	COM-416	3.00	----	----	4
Sum	المجموع	----	30	14	1	10

8-مخرجات التعلم المتوقعة للبرنامج

المعرفة	
1أ. القدرة والقابلية على تطبيق المعرفة في جميع تخصصات قسم علوم الحاسوب والعلوم الأخرى المرتبطة بها أو القريبة منها مثل علم الاحصاء والهندسة وتكنولوجيا المعلومات وغيرها.	فهم المسؤولية المهنية والأخلاقية من خلال خدمة المجتمع. القدرة على استخدام التقنيات والمهارات الرقمية والرياضية التي أصبحت اساس لجميع العلوم الحديثة.
2أ. المعرفة المفصلة والفهم لمقدار واسع من العلوم الرياضية والبرمجية	تطبيق لغات برمجية مختلفة في مختبرات القسم.
3أ. اكتشاف معارف جديدة تسهم في تحقيق متطلبات الحياة	كيفية ترابط المعرفة بالعلوم الأخرى ومساهمتها في الحصول على معارف أخرى
4أ. تعريف الطالب بمجال رسومات الحاسوب ومعالجة المعلومات المرئية والهندسية باستخدام التقنيات الحاسوبية.	اعداد خريجين مؤهلين للعمل في مجال التطبيقات المحوسبة و تمثيل البيانات.
المهارات	
ب1- يتمتع الخريجين بمهارات مكتسبة لعدد في البرامج التطبيقية تؤهلهم من تحليل البيانات واستخلاص النتائج .	- يتمتع الخريجين بمهارات تؤهلهم للعمل في سوق العمل . - إمكانية الخريجين العمل في كافة مؤسسات الدولة الحكومية والقطاع الخاص لما يتمتعون به من كفاءة .
ب2-القابلية على تعريف وصياغة ومعالجة المشاكل التي تحتاج الى برمجة و حلول رياضية .	القدرة على تحليل واستنباط النتائج من خلال استخدام العديد من البرامج التطبيقية مثل (Matlab , SQL, mobile studio , python , C++) وغيرها من البرامج التطبيقية .

ب3- تحفيز الطلاب لعمل مشاريع تخدم الجامعة والقسم.	يوفر البرنامج فرصة التعلم للطلبة باستخدام أحدث الاجهزة التقنية والبرامج التطبيقية الحديثة التي تلبي طموح الطلبة.
ب4- مهارات الاستخدام والتطوير	بالاستعانة بخبرة التدريسين في قسمنا حيث ان اغلبهم من حملة الشهادات العليا من جامعات عالمية (امريكا - تركيا - فرنسا - الصين - ماليزيا)
القيم	
ج1- خلق روح العمل الجماعي بين الطلاب	من خلال مجاميع المختبرات والمشاريع التخرج والتقارير
ج2- تعزيز ثقة الطالب بنفسه من خلال المناقشات اليومية	عن طريق السمنارات
ج3- تعزيز ثقة الطالب على مواجهة الصعاب من خلال اكمال المسيرة الدراسية	من خلال اكتسابهم مهارات للاندخراط بسوق العمل
ج4. بيان الاثار الايجابية عند التحلي بهذه القيم وبيان الاثار السلبية عند عجم التحلي بيها	الترغيب والترهيب والتشويق والتحفيز

7. استراتيجيات التعليم والتعلم
- الشرح باستخدام ادوات العرض الحديثة المختلفة- طريقة المحاضرة واستخدام السبورة التفاعلية - تزويد الطلبة بالاساسيات والمواضيع الاضافية المتعلقة بالبرامج الشبئية . - تكوين مجموعات نقاشية خلال المحاضرات لمناقشة الانظمة الحديثة والتي تتطلب التفكير والتحليل -الطلب من الطلبة مجموعة من الاسئلة التفكيرية خلال المحاضرات مثل ماذا وكيف ومتى ولماذا لمواضيع محددة - اعطاء الطلبة واجبات بيتية تتطلب تفسيرات ذاتية بطرق سببية

8.طرائق التقييم
1- الاختبارات العملية 2- الاختبارات النظرية 3- التقارير والدراسات 4- امتحانات يومية باسئلة حلها ذاتيا 5 - درجات محددة بواجبات بيتية

9. الهيئة التدريسية							
أعضاء هيئة التدريس							
الرتبة العلمية		التخصص		المتطلبات/المهارات الخاصة (ان وجدت)		اعداد الهيئة التدريسية	
						عام	خاص
						ملاك	محاضر
استاذ		علوم حاسبات		محاكاة ذكاء اصطناعي		ملاك	
استاذ		علوم حاسبات		حاسبات		ملاك	
استاذ		علوم حاسبات		تكنولوجيا وعلوم الحاسبات		ملاك	
استاذ		علوم حاسبات		برمجة شيئية و مرئية		ملاك	
استاذ		علوم حاسبات		تقنيات تطبيقات الحاسوب		ملاك	
استاذ		علوم حاسبات		الذكاء الاصطناعي		ملاك	
استاذ		علوم حاسبات		تكنولوجيا المعلومات		ملاك	
استاذ		علوم حاسبات		معلوماتية حيوية		ملاك	
استاذ		علوم حاسبات		تكنولوجيا المعلومات		ملاك	
استاذ		علوم حاسبات		تكنولوجيا المعلومات		ملاك	
استاذ		علوم حاسبات		شبكات الحاسوب		ملاك	
استاذ مساعد		علوم حاسبات		تقنية المعلومات		ملاك	
استاذ مساعد		علوم حاسبات		تكنولوجيا المعلومات		ملاك	
استاذ مساعد		هندسة كهرباء		اتصالات		ملاك	
استاذ مساعد		علوم حاسبات		شبكات واتصالات		ملاك	
استاذ مساعد		علوم حاسبات		ذكاء اصطناعي		ملاك	
استاذ مساعد		علوم حاسبات		ذكاء اصطناعي		ملاك	
استاذ مساعد		علوم حاسبات		امن سبراني		ملاك	
استاذ مساعد		علوم حاسبات		ذكاء اصطناعي		ملاك	
استاذ مساعد		علوم حاسبات		علوم حاسبات\ امنية البيانات\ تشفير		ملاك	
مدرس		علوم الحاسبات		علوم الحاسبات		ملاك	
مدرس		علوم الحاسبات		علوم الحاسبات		ملاك	
مدرس		علوم الحاسبات		علوم الحاسبات		ملاك	
مدرس		علوم الحاسبات		علوم الحاسبات		ملاك	
مدرس		علوم الحاسبات		علوم الحاسبات		ملاك	

مدرس	علوم الحاسبات	علوم الحاسبات		ملاك	
مدرس مساعد	علوم الحاسبات	علوم الحاسبات		ملاك	
مدرس مساعد	علوم الحاسبات	علوم الحاسبات		ملاك	
مدرس مساعد	علوم الحاسبات	علوم الحاسبات		ملاك	
مدرس مساعد	علوم الحاسبات	علوم الحاسبات		ملاك	

التطوير المهني
توجيه أعضاء هيئة التدريس الجدد
1. اقامة دورات تطويرية للمتعيينين الجدد لرفع مستوى كفاءاتهم 2. اقامة ندوات تطويرية للمتعيينين الجدد لرفع مستوى كفاءاتهم 3. اقامة ورش عمل تطويرية للمتعيينين الجدد لرفع مستوى كفاءاتهم
التطوير المهني لأعضاء هيئة التدريس
المشاركة في اعطاء محاضرات للمواد الثانوية باشراف رئاسة القسم من اجل تهيئته لاعطاء محاضرات للمواد الاساسية

10. معيار القبول
قبول مركزي

11. أهم مصادر المعلومات عن البرنامج
وزارة التعليم العالي والبحث العلمي جامعة ديالى كلية العلوم قسم علوم الحاسوب موقع كلية العلوم /https://sciences.uodiyala.edu.iq

12. خطة تطوير البرنامج
نسعى للحصول على الاعتماد البرامجي

مخطط مهارات البرنامج															
مخرجات التعلم المطلوبة من البرنامج															
القيم				المهارات				المعرفة				اساسي أم اختياري	رمز المقرر	اسم المقرر	السنة / المستوى
ج4	ج3	ج2	ج1	ب4	ب3	ب2	ب1	أ4	أ3	أ2	أ1				
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM21	نظم التشغيل (1)	المرحلة الرابعة \ الكورس الأول (نظام الكورسات)
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM23	أحتساب الأمنية (1)	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	OPT22	تعلم الماكنة	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	OPT50	المحاكاة والنمذجة	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	OPT20	الترميز وضغط البيانات	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	OPT16	أنظمة متعدد الوسائط	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM29	مشروع بحث (1)	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM22	نظم تشغيل (2)	

●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM24	أحتساب الأمنية (2)	المرحلة الرابعة \ الكورس الأول (نظام الكورسات)
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	OPT54	الأحتساب التطوري	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	OPT53	أمنية الشبكات	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	OPT23	تنقيب البيانات	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	OPT51	الأحتساب المتنقل	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM29	مشروع بحث (1)	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-311	مترجم لغة	الثالثة \ فرع الحاسوب
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-312	ذكاء اصطناعي	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-313	تشفير	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-314	معالجة صورة رقمية	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-315	مقدمة الى قواعد البيانات	

●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-316	منهجية البحث	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-321	هندسة برامجيات	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	COM-322	تطوير تطبيقات الويب	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-323	أمنية الحاسوب	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-324	تمثيل معرفة	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-325	قواعد بيانات موزعة	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-326	تمييز الأنماط	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	CYB-311	اساسيات الامن السيبراني	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-314	معالجة صورة رقمية	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-313	تشفير	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	CYB-312	أمن التواصل الاجتماعي	

●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-312	ذكاء اصطناعي	الثالثة\ فرع الامن السيبراني
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-316	منهجية البحث	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-321	معالجة الاشارة الرقمية	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-322	شبكات الحاسوب	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-326	تمييز الأنماط	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	CYB-321	منصات الامن السيبراني	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	CYB-324	تطبيقات برمجية (امنية)	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-322	تطوير تطبيقات الويب	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-314	معالجة صورة رقمية	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-312	ذكاء اصطناعي	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	MED-311	تقنية المعلومات الطبية	

●	●	●	●	●	●	●	●	●	●	●	●	اساسي	MED-312	الأجهزة الطبية	الثالثة فرع المعلومات الطبية
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	MED-313	سجلات المريض الالكترونية	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-316	منهجية البحث	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-321	معالجة الإشارة الرقمية	
●	●	●	●	●	●	●	●	●	●	●	●	اختياري	MED-321	تطبيقات برمجية (طبية)	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	MED-322	علم وظائف الاعضاء الباثولوجي	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-326	تمييز الأنماط	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	MED-323	التوثيق الطبي	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	MED-324	علم الأحياء الحسابي	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-211	مقدمة الى لغة الكيانات	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-212	هياكل بيانات	

●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-213	نظرية أحتسابية	الثانية
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-214	تصميم و برمجة الويب	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	SCI-201	طرائق عددية	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	UD-201	جرائم البعث	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-221	تصميم وتحليل الخوارزميات	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-222	رسوم الحاسوب	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-223	معمارية الحاسوب	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-224	بايثون	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-225	برمجة كياتية	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	UD-202	لغة عربية 2	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	UD-203	لغة إنكليزية 2	

●	●	●	●	●	●	●	●	●	●	●	●	اساسي	SCI-101	طرائق التفاضل	الأولى
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-111	مقدمة الى البرمجة	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-112	رياضيات حاسوبية	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-113	مهارات الحاسوب	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-114	تصميم منطقي	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	UD-101	اللغة الانكليزية	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	SCI-101	طرائق التفاضل	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	SCI-102	طرائق التكامل	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-121	أساسيات البرمجة	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-122	هياكل متقطعة	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	COM-123	تركيب الحاسوب	

●	●	●	●	●	●	●	●	●	●	●	●	اساسي	UD-102	حقوق الانسان والديمقراطية	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	UD-103	اللغة العربية	
●	●	●	●	●	●	●	●	●	●	●	●	اساسي	SCI-102	طرائق التكامل	

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

نموذج وصف المقرر

1. اسم المقرر :: أحتساب تطوري	
2. رمز المقرر :: OPT54	
3. الفصل / السنة :: فصلي	
4. تاريخ إعداد هذا الوصف :: 2025/6/14	
5. أشكال الحضور المتاحة :: حضور داخل الجامعة	
6. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي) :: 2 نظري لكل اسبوع	
7. اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر) الاسم: أ.د. زياد طارق مصطفى الأيمل :	
8. اهداف المقرر	
اهداف المادة الدراسية ان هذا المنهج الاكاديمي هو مقدمة أساسية للتعلم ومعرفة خوارزميات البحث الجينية. الطالب سوف يتعلم العناصر الرئيسية للخوارزمية الجينية، مثل نظرية التطور، أنواع الخوارزميات الجينية؛ وكذلك خطوات الخوارزمية الجينية كالأختيار والترميز والأختيار والتزاوج والطفرة الوراثية. ويهدف المنهج الى:- 1. الهدف المطلوب من الطالب لكي يجتاز بنجاح متطلبات المقرر هو إدراك الطالب لخوارزمية البحث الجينية و أهمية استخدامها بالإضافة إلى المجالات التطبيقية التي تدخل فيها هذا الحقل. 2. إدراك الطالب لأنواع اطرق البحث وأنواعها. 3. تطوير إمكانية الطالب استخدام البرمجيات المتوفرة في هذا المجال بالإضافة إلى المهارات التي يكتسبها في مجال البرمجة الجينية والرياضيات الجينية.	
9. استراتيجيات التعليم والتعلم	
الاستراتيجية - الشرح باستخدام ادوات العرض الحديثة المختلفة- طريقة المحاضرة واستخدام السبورة التفاعلية - تزويد الطلبة بالاساسيات والمواضيع الاضافية المتعلقة بحماية البيانات . -تكوين مجموعات نقاشية خلال المحاضرات لمناقشة الانظمة الحديثة والتي تتطلب التفكير والتحليل -الطلب من الطلبة مجموعة من الاسئلة التفكيرية خلال المحاضرات مثل ماذا وكيف ومتى ولماذا لمواضيع محددة	

- اعطاء الطلبة واجبات بيتية تتطلب تفسيرات ذاتية بطرق سببية					
10. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
1.	3		Evolutionary Computation Introduction	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
2.	3		Biological Evolutionary theory	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
3.	3		Genetic Algorithms Types	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
4.	3		Seeding the population and Encoding	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
5.	3		Selection	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
6.	3		Selection Types	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
7.	3		Crossover	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
8.	3		Crossover Types	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
9.	3		Mutation	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
10.	3		Mutation Types	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
11.	3		Complete Example	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
12.	3		TSP using Genetic	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
13.	3		Routing using genetic	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
14.	3		4 Queen puzzle using genetic	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
15.	3		Genetic tutorial	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
16.					
11. تقييم المقرر					
1- الاختبارات العملية 2- الاختبارات النظرية					

3- التقارير والدراسات	
4- امتحانات يومية بأسئلة حلها ذاتيا	
5 - درجات محددة بواجبات بيتية	
12. مصادر التعلم والتدريس	
-----	الكتب المقررة المطلوبة (المنهجية أن وجدت)
Machine Learning, Tom Mitchell, McGraw Hill Press, 1997	المراجع الرئيسة (المصادر)
-----	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)
1- Fundamentals of genetic algorithms: Architecture, Algorithms, and Applications, LaureneFausett, 2002. Practical Genetic Algorithms, Randy L. Haupt, 2004	المراجع الإلكترونية ، مواقع الانترنت

14. رمز المقرر: OPT50

15. الفصل / السنة :: فصلي

16. تاريخ إعداد هذا الوصف :: 2025/6/14

17. أشكال الحضور المتاحة :: حضور داخل الجامعة

18. عدد الساعات الدراسية (الكلي) / عدد الوحدات (الكلي) :: 2 نظري لكل اسبوع

19. اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر)

الاسم: أ.م. غسان صبيح محمود
الأيمل :

20. اهداف المقرر

اهداف المادة الدراسية

تهدف الى اعداد الطالب علمي يتعرف على
الخصائص التي تتميز بها البرامج الكفوءة
واستخدام ميزات حماية البيانات فضلا عن ما هو
مستخدم في لغات البرمجة.

21. استراتيجيات التعليم والتعلم

الاستراتيجية

- الشرح باستخدام ادوات العرض الحديثة المختلفة- طريقة المحاضرة واستخدام السبورة التفاعلية
- تزويد الطلبة بالاساسيات والمواضيع الاضافية المتعلقة بحماية البيانات .
- تكوين مجموعات نقاشية خلال المحاضرات لمناقشة الانظمة الحديثة والتي تتطلب التفكير والتحليل
- الطلب من الطلبة مجموعة من الاسئلة التفكيرية خلال المحاضرات مثل ماذا وكيف ومتى ولماذا لمواضيع محددة
- اعطاء الطلبة واجبات بيتية تتطلب تفسيرات ذاتية بطرق سببية

22. بنية المقرر

الاسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
17	2	مقدمة للمحاكاة المنطقية	INTRODUCTION TO DISCRETE EVENT SIMULATION	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
18	2	اساسيات المحاكاة	BASIC EVENT SCHEDULING SIMULATION	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
19	2	المحاكاة اليدوية	BASIC EVENT SCHEDULING SIMULATION	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري

اختبار شفهي أو تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	BASIC EVENT SCHEDULING SIMULATION	بيان جدولة أحداث المحاكاة	2	20
اختبار شفهي أو تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Simulation Outputs.	نتائج المحاكاة	2	21
اختبار شفهي أو تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Expected average number of customers in queue	شرح معدل عدد الزبائن	2	22
اختبار شفهي أو تحريري	اختبار تحريري	computer representation	تمثيل الحاسبات	2	23
اختبار شفهي أو تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Flowchart for arrival	مخطط الوصول	2	24
اختبار شفهي أو تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Flowchart for departure event routine	مخطط انتهاء الخدمة	2	25
اختبار شفهي أو تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	SIMULATION PROGRAMMING	شرح برنامج المحاكاة	2	26
اختبار شفهي أو تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Arrival and departure event function	شرح دالة الوصول وانتهاء الخدمة	2	27
اختبار شفهي أو تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	REVIEW OF BASIC PROBABILITY AND STATISTICS	توضيح أساسيات الاحتمالات الاحصائية	2	28
اختبار شفهي أو تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Exponential, Poisson, normal, uniform, and Binomial distribution.	توضيح علا من التوزيعات الاحصائية مثل النورمل ..	2	29
اختبار شفهي أو تحريري	اختبار تحريري	RANDOM NUMBER GENERATION	توليد الارقام العشوائية	2	30
		Chi-square test and K-S test basis	شرح الاختبارات الكاي سكور والكاي		31

23.تقييم المقرر

- 1- الاختبارات العملية
- 2- الاختبارات النظرية
- 3- التقارير والدراسات
- 4- امتحانات يومية بأسئلة حلها ذاتيا
- 5 - درجات محددة بواجبات بيئية

24. مصادر التعلم والتدريس

-----	الكتب المقررة المطلوبة (المنهجية أن وجدت)
Fundamantals of Neural Networks: Architecture, Algorithms, and application. By Laurene Fausett, 2015	الراجع الرئيسية (المصادر)
COS 511: Theoretical Machine Learning http://www.cs.princeton.edu/courses/archive/spr08/cos511/scribe_notes/0204.pdf	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)
http://people.revoledu.com/kardi/tutorial/DecisionTree/how-to-usedecision-tree.htm	الراجع الإلكترونية ، مواقع الانترنت

نموذج وصف المقرر

نموذج وصف المقرر

25. اسم المقرر: امنية شبكات	
26. رمز المقرر: OPT53	
27. الفصل / السنة :: فصلي	
28. تاريخ إعداد هذا الوصف :: 2025/6/14	
29. أشكال الحضور المتاحة :: حضور داخل الجامعة	
30. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي): 3 نظري لكل اسبوع	
31. اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر) الاسم: م.د. برهان مولان صالح الأيمل :	
32. اهداف المقرر	
اهداف المادة الدراسية تعليم الطالب اساسية امنية الشبكات. الطالب سوف يتعلم العناصر الرئيسية لامنية الشبكات بصورة علمية وامنية الانترنت بصورة خاصة ، مثل انواع الهجوم المحتمل ، وكذلك انواع وطرق الحماية عبر الوب ومختلف انواع خوارزميات والبروتوكولات المستخدمة في امنية الشبكات وماهي امنية الجلسات. ويهدف المنهج الى:- 1- الهدف المطلوب من الطالب لكي يجتاز بنجاح متطلبات المقرر هو ادراك الطالب لمباديء امنية الشبكات واهمية استخدامها عبر الانترنت بالاضافة الى المجالات التطبيقية الذي يدخل فيها هذا الحقل. 2- ادراك الطالب لانواع طرق البحث وانواعها. 3- تطوير امكانية الطالب استخدام البرمجيات المتوفرة في هذا المجال بالاضافة الى المهارات التي يكتسبها في مجال البرمجة والتشفير.	
33. استراتيجيات التعليم والتعلم	
الاستراتيجية - الشرح باستخدام ادوات العرض الحديثة المختلفة- طريقة المحاضرة واستخدام السبورة التفاعلية - تزويد الطلبة بالاساسيات والمواضيع الاضافية المتعلقة بحماية البيانات . - تكوين مجموعات نقاشية خلال المحاضرات لمناقشة الانظمة الحديثة والتي تتطلب التفكير والتحليل	

- الطالب من الطلبة مجموعة من الاسئلة التفكيرية خلال المحاضرات مثل ماذا وكيف ومتى ولماذا لمواضيع محددة - اعطاء الطلبة واجبات بيتية تتطلب تفسيرات ذاتية بطرق سببية					
34. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
32.	3		the basics of the Internet security	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
33.	3		exploring the attacks techniques that can be used by attackers	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
34.	3		the ways of defense.	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
35.	3		Control hijacking attacks	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
36.	3		Exploitation techniques and fuzzing;	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
37.	3		Secure system design	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
38.	3		access control.	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
39.	3		protection Tools for	اختبار تحريري	اختبار تحريري

		writing robust application code			
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	web security models		3	.40
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	User authentication		3	.41
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	session management		3	.42
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Cross-Site Attacks; SQL Injection Attacks;		3	.43
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	What is SSL;		3	.44
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	What is HTTPS, how it works, its pitfalls;.		3	.45
اختبار تحريري	اختبار تحريري	What is certificates, where it can be used and how can created;		3	.46
					.47
35.تقييم المقرر					
1- الاختبارات العملية 2- الاختبارات النظرية 3- التقارير والدراسات 4- امتحانات يومية بأسئلة حلها ذاتيا 5 - درجات محددة بواجبات بيتية					
36.مصادر التعلم والتدريس					
Cryptography and network security, 5th 1 - Edition, William Stallings, 2011			الكتب المقررة المطلوبة (المنهجية أن وجدت)		
Network Security and Management. PHI Learning Pvt. Ltd., 2011.			المراجع الرئيسة (المصادر)		

<i>Guide to computer network security.</i> Heidelberg, Germany: Springer, 2013.	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)
https://www.cisco.com/c/ar_ae/products/security/what-is-cybersecurity.html	المراجع الإلكترونية ، مواقع الانترنت

نموذج وصف المقرر

37. اسم المقرر :: ترميز وضغط البيانات	
38. رمز المقرر :: COM-415	
39. الفصل / السنة :: فصلي	
40. تاريخ إعداد هذا الوصف :: 2025/6/14	
41. أشكال الحضور المتاحة :: حضور داخل الجامعة	
42. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي) :: 3 ساعة نظري لكل اسبوع	
43. اسم مسؤول المقرر الدراسي (إذا أكثر من اسم يذكر) الاسم: م.د. برهان مولان صالح الأيمل :	
44. أهداف المقرر	
أهداف المادة الدراسية	تعليم الطالب أساسية ترميز وضغط البيانات. الطالب سوف يتعلم العناصر الرئيسية لترميز وضغط البيانات بصورة علمية ترمز وضغط البيانات بصورة خاصة ، مثل انواع الخوارزميات المستخدمة بترميز وضغط البيانات وماهي الاختلافات بين هذه الطرق ومهامها ومسؤولها. ويهدف المنهج الى:- 4- الهدف المطلوب من الطالب لكي يجتاز بنجاح متطلبات المقرر هو ادراك الطالب لمبادئ ترمز وضغط البيانات بالاضافة الى المجالات التطبيقية الذي يدخل فيها هذا الحقل. 5- ادراك الطالب لانواع طرق البحث وانواعها. تطوير امكانية الطالب استخدام البرمجيات المتوفرة في هذا المجال بالاضافة الى المهارات التي يكتسبها في مجال البرمجة والضغط
45. استراتيجيات التعليم والتعلم	
الاستراتيجية	- الشرح باستخدام ادوات العرض الحديثة المختلفة- طريقة المحاضرة واستخدام السبورة التفاعلية - تزويد الطلبة بالاساسيات والمواضيع الاضافية المتعلقة بحماية البيانات .

-تكوين مجموعات نقاشية خلال المحاضرات لمناقشة الانظمة الحديثة والتي تتطلب التفكير والتحليل -الطلب من الطلبة مجموعة من الاسئلة التفكيرية خلال المحاضرات مثل ماذا وكيف ومتى ولماذا لمواضيع محددة - اعطاء الطلبة واجبات بيتية تتطلب تفسيرات ذاتية بطرق سببية					
46. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
18	3		Introduction to coding and data compression	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
19	3		Basic techniques and methods	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
50	3		Basic VL codes	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
51	3		Statistical Methods	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
52	3		Statistical Methods	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
53	3		Image compression	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
54	3		Image compression	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
55	3		Exam1	اختبار تحريري	اختبار تحريري
56	3		Wavelet methods	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري

اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Video compression		3	57
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Video compression		3	58
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Audio compression		3	59
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Audio compression		3	60
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Presentation		3	61
اختبار تحريري	اختبار تحريري	Exam2		3	62
					63
47.تقييم المقرر					
1- الاختبارات العملية 2- الاختبارات النظرية 3- التقارير والدراسات 4- امتحانات يومية بأسئلة حلها ذاتيا 5 - درجات محددة بواجبات بيتية					
48.مصادر التعلم والتدريس					
Handbook of Data Compression fifth			الكتب المقررة المطلوبة (المنهجية أن وجدت)		
Sayood, Khalid. <i>Introduction to data compression</i>. Morgan Kaufmann, 2017.			المراجع الرئيسية (المصادر)		
Salomon, David, and Giovanni Motta. <i>Handbook of data compression</i>. London; New York: Springer,, 2010.			الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير)		
-----			المراجع الإلكترونية ، مواقع الانترنت		

نموذج وصف المقرر

1. اسم المقرر تعلم الماكينة	
2. رمز المقرر 404COML	

3.	الفصل / السنة الفصل الأول / 2025-2026 فصلي					
4.	تاريخ إعداد هذا الوصف 2025/6/14					
5.	أشكال الحضور المتاحة حضور الزامي					
6.	عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي) 2ساعة نظري + 2 ساعة عملي (أسبوعيا) / 3 وحدة					
7.	اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر) الاسم: أ.د. زياد طارق مصطفى الأيميل : ziyad1964tariq@uodiyala.edu.iq					
8.	اهداف المقرر					
اهداف	المادة الدراسية					
تعليم	لطالب طرق تعلم الماكنة (الحاسبة) التي تعتمد على الاستنتاج والتوقع المستقبلي للأحداث					
من خ	لال الطرق الأحصائية والشبكات الأصطناعية وتطبيقاتها العملية (البرمجية) الهادفة الى					
التطو	ير ومواكبة التطور العلمي للخوارزميات وطرق البحث					
9.	استراتيجيات التعليم والتعلم					
الاستر	يجية					
	تدريس وتعليم الطلبة كافة المعلومات الضرورية واللازمة الخاصة بمادة تعلم الماكنة مما يؤهلهم للعمل والبحث في كافة مجالات طرق البحث والتوقع					
10.	بنية المقرر					
	الأسبوع	الساعات	مخرجات التعلم المطلوبة	أسم الوحدة أو الموضوع	طريقة التعلم	طريقة التقييم
	1	4	أعطاء معنى نعلم الحاسوب	Introduction to Machine Learning.	الاسبورة والشاشة والدانا شو	امتحانات يومية وواجبات ببينة بالاضافة الى الامتحانات الشهرية
	2	4	نوضيح نماذج نعلم الماكنة	Machine learning Models	الاسبورة والشاشة والدانا شو	امتحانات يومية وواجبات ببينة بالاضافة الى الامتحانات الشهرية

امتحانات يومية وواجبات ببنية بالاضافة الى الامتحانات الشهرية	السبورة والشاشة والدانا شو	Find S Algorithm. And List Eliminate Algorithm.	شرح خوارزميات s وقائمة الحذف	4	3
امتحانات يومية وواجبات ببنية بالاضافة الى الامتحانات الشهرية	السبورة والشاشة والدانا شو	Candidate Elimination Algorithm.	شرح خوارزمية المرشح للحذف	4	4
امتحانات يومية وواجبات ببنية بالاضافة الى الامتحانات الشهرية	السبورة والشاشة والدانا شو	Entropy and Information Gain.	نوضح المقاييس اللوغاريتمية لرعي المعلومات	4	5
امتحانات يومية وواجبات ببنية بالاضافة الى الامتحانات الشهرية	السبورة والشاشة والدانا شو	Decision Tree Algorithm with Example.	شرح ومثال لخوارزمية شجرة القرار	4	6
امتحانات يومية وواجبات ببنية بالاضافة الى الامتحانات الشهرية	السبورة والشاشة والدانا شو	Introduction to Neural networks.	مقدمة عن الشبكات العصبية	4	7
امتحانات يومية وواجبات ببنية بالاضافة الى الامتحانات الشهرية	السبورة والشاشة والدانا شو	McCulloch Pitts model.	نوضح نموذج مكولج بنس	4	8
امتحانات يومية وواجبات بنية بالاضافة الى الامتحانات الشهرية	السبورة والشاشة والدانا شو	Single Neuron Model.	نموذج الخلية العصبية المنفردة	4	9

10	4	شرح نموذج الخلابا المتعددة	Multiple Neurons Model.	السبورة والشاشة والدانا شو	امتحانات يومية وواجبات بنية بالاضافة الى الامتحانات الشهرية
11	4	ماهي دالة الألتقال وأنواعها	Transfer functions.	السبورة والشاشة والدانا شو	امتحانات يومية وواجبات بنية بالاضافة الى الامتحانات الشهرية
12	4	نوضيح نموذج الطبقة الواحدة	Single layer Model.	السبورة والشاشة والدانا شو	امتحانات يومية وواجبات بنية بالاضافة الى الامتحانات الشهرية
13	4	نوضيح النموذج متعدد الطبقات	Multiple Layers Model.	السبورة والشاشة والدانا شو	امتحانات يومية وواجبات بنية بالاضافة الى الامتحانات الشهرية
14	4	شرح التعلم والنكيف في الشبكات العصبية	Learning and Adaptation.	السبورة والشاشة والدانا شو	امتحانات يومية وواجبات بنية بالاضافة الى الامتحانات الشهرية
15	4	شرح قاعدة نعلم هبين والأدراك	Habbeian Learning Rule. And Perceptron Learning Rule.	السبورة والشاشة والدانا شو	امتحانات يومية وواجبات بنية بالاضافة الى الامتحانات الشهرية
16	4	نوضيح قاعدة نعلم دلنا وودرو هوف	Delta Learning Rule. And Widrow Hoff Learning Rule	السبورة والشاشة والدانا شو	امتحانات يومية وواجبات بنية بالاضافة الى الامتحانات الشهرية
تقييم المقرر					
11	توزيع الدرجة من 100 على وفق المهام المكلف بها الطالب مثل التحضير اليومي والامتحانات اليومية والشفوية والشهرية والتحريرية والتقارير الخ				
12	مصادر التعلم والتدريس				
المراجع الرئيسية (المصادر)	Machine Learning, Tom Mitchell, McGraw Hill, 1997		المقرر المطلوبة (المنهجية أن وجدت)		
	Fundamantals of Neural Networks: Architecture, Algorithms, and Application. By Laurene Fausett, 2015				

COS 511: Theoretical Machine Learning http://www.cs.princeton.edu/courses/archi ve/spr08/cos511/scribe_notes/0204.pdf	المراجع الساندة التي يوصى بها (المجلات العلمية، التقارير)
http://people.revoledu.com/kardi/tutorial/D ecisionTree/how-to-usedecision-tree.htm	المراجع الإلكترونية ، مواقع الانترنت

نموذج وصف المقرر

49. اسم المقرر :: احتساب الامنية2				
50. رمز المقرر :: COM24				
51. الفصل / السنة :: فصلي				
52. تاريخ إعداد هذا الوصف :: 2025/6/14				
53. أشكال الحضور المتاحة :: حضور داخل الجامعة				
54. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي) :: 2 نظري + 2 عملي لكل اسبوع				
55. اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر) الاسم: أ.م. غسان صبيح محمود الأيمل :				
56. اهداف المقرر				
اهداف المادة الدراسية		تهدف الى اعداد الطالب علمي يتعرف على الخصائص التي تتميز بها البرامج الكفوءة واستخدام ميزات حماية البيانات فضلا عن ما هو مستخدم في لغات البرمجة.		
57. استراتيجيات التعليم والتعلم				
الاستراتيجية		- الشرح باستخدام ادوات العرض الحديثة المختلفة- طريقة المحاضرة واستخدام السبورة التفاعلية - تزويد الطلبة بالاساسيات والمواضيع الاضافية المتعلقة بحماية البيانات . - تكوين مجموعات نقاشية خلال المحاضرات لمناقشة الانظمة الحديثة والتي تتطلب التفكير والتحليل - الطلب من الطلبة مجموعة من الاسئلة التفكيرية خلال المحاضرات مثل ماذا وكيف ومتى ولماذا لمواضيع محددة - اعطاء الطلبة واجبات بيتية تتطلب تفسيرات ذاتية بطرق سببية		
58. بنية المقرر				
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم
				طريقة التقييم

اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Introduction	فهم التشفير	2	64
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Elliptic Curve Cryptosystems	ECC فهم ال	2	65
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Elliptic Curve Models	التعرف على الانواع الاساسية	2	66
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Digital Signatures	ادراك مفهوم ال توقيع الرقمي	2	67
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Digital Signatures Models	التعرف على الانواع الرئيسية	2	68
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Hash Functions	فهم دوال التجزئة	2	69
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Hash Functions Family	معرفة انواعها	2	70
اختبار تحريري	اختبار تحريري	Exam 1		2	71
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Message Authentication Codes (MACs)	MACs فهم ال	2	72
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Key Establishment	Key Establishment التعرف على	2	73
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Access controls	فهم مفهوم سياسة الوصول	2	74
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Models of Access controls	التعرف على انواعها	2	75
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Protocols	فهم البروتوكولات	2	76
اختبار شفهي او تحريري	محاضرة الكترونية باستخدام محرر مايكروسوفت	Protocols types	انواع البروتوكولات	2	77
اختبار تحريري	اختبار تحريري	Exam 2		2	78
					79
59.تقييم المقرر					
1- الاختبارات العملية 2- الاختبارات النظرية 3- التقارير والدراسات 4- امتحانات يومية بأسئلة حلها ذاتيا 5 - درجات محددة بواجبات بيتية					
60.مصادر التعلم والتدريس					
-----			الكتب المقررة المطلوبة (المنهجية أن وجدت)		
Understanding Cryptography, .Christof Paar · Jan Pelzl			المراجع الرئيسية (المصادر)		

Cryptography and Network Security: Principles and Practice, William Stallings	
-----	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)
-----	المراجع الإلكترونية ، مواقع الانترنت

نموذج وصف المقرر

61. اسم المقرر :: احتساب الامنية	
62. رمز المقرر :: COM23	
63. الفصل / السنة :: فصلي	
64. تاريخ إعداد هذا الوصف :: 2025/6/14	
65. أشكال الحضور المتاحة :: حضور داخل الجامعة	
66. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي)::: 2 نظري + 2 عملي لكل اسبوع	
67. اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر) الاسم: أ.م. غسان صبيح محمود الأيمل :	
68. اهداف المقرر	
اهداف المادة الدراسية	تهدف الى اعداد الطالب علمي يتعرف على الخصائص التي تتميز بها البرامج الكفوءة واستخدام ميزات حماية البيانات فضلا عن ما هو مستخدم في لغات البرمجة.
69. استراتيجيات التعليم والتعلم	
الاستراتيجية	- الشرح باستخدام ادوات العرض الحديثة المختلفة- طريقة المحاضرة واستخدام السبورة التفاعلية - تزويد الطلبة بالاساسيات والمواضيع الاضافية المتعلقة بحماية البيانات . - تكوين مجموعات نقاشية خلال المحاضرات لمناقشة الانظمة الحديثة والتي تتطلب التفكير والتحليل - الطلب من الطلبة مجموعة من الاسئلة التفكيرية خلال المحاضرات مثل ماذا وكيف ومتى ولماذا لمواضيع محددة - اعطاء الطلبة واجبات بيتية تتطلب تفسيرات ذاتية بطرق سببية

70. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
.80	2	التعرف على الحماية	Introduction	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.81	2	فهم التشفير	Cryptography	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.82	2	فهم التشفير	Stream Ciphers	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.83	2	فهم DES	Data Encryption Standard (DES) part1	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.84	2	فهم DES	Data Encryption Standard (DES) part2	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.85	2	AES ادراك معني	Advanced Encryption Standard (AES) part 1	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.86	2	AES تطبيق ال	Advanced Encryption Standard (AES) part 2	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.87	2		Exam 1	اختبار تحريري	اختبار تحريري
.88	2	فهم موديلات الاساسية	More About Block Ciphers	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.89	2	التعرف على التشفير بالمفتاح العام	Introduction to Public-Key Cryptography	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.90	2	التعرف على النظريات الاساسية	Essential Number Theory for Public- Key Algorithms	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.91	2	RSA فهم ال	The RSA Cryptosystem	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.92	2	RSA تطبيق ال	Finding Large Primes for RSA , Attacks and countermeasures	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.93	2	DLP فهم ال	Public-Key Cryptosystems Based on the Discrete Logarithm Problem	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
.94	2		Exam 2	اختبار تحريري	اختبار تحريري

					95.
71.تقييم المقرر					
1- الاختبارات العملية 2- الاختبارات النظرية 3- التقارير والدراسات 4- امتحانات يومية بأسئلة حلها ذاتيا 5 - درجات محددة بواجبات بيتية					
72.مصادر التعلم والتدريس					
-----			الكتب المقررة المطلوبة (المنهجية أن وجدت)		
Understanding Cryptography, .Christof Paar · Jan Pelzl Cryptography and Network Security: Principles and Practice, William Stallings			المراجع الرئيسة (المصادر)		
-----			الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)		
-----			المراجع الإلكترونية ، مواقع الانترنت		

نموذج وصف المقرر

73. اسم المقرر	
انظمة متعددة الوسائط	
74. رمز المقرر	
OPT16	
75. الفصل / السنة	
الفصل الاول/2025-2026	
76. تاريخ إعداد هذا الوصف	
2025/6/1	
77. أشكال الحضور المتاحة	
حضور	
78. عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي)	
3 / 30	
79. اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر)	
الاسم: م.م. منى رشيد حميد الأيميل : munarashid@uodiyala.edu.iq	
80. اهداف المقرر	
اهداف المادة الدراسية • ان هذا المنهج الاكاديمي هو مقدمة أساسية في كيفية بناء وتصميم الخوارزميات وما هي أفضل الطرق المتبعة في اختيار الخوارزمية لحل المشكلة قيد البحث على ان يكون الاختيار يأخذ بنظر الاعتبار الوقت اللازم والمساحة التخزينية . - ويهدف المنهج الى:- الهدف المطلوب من الطالب لكي يجتاز بنجاح متطلبات المقرر هو إدراك الطالب كيفية اختيار الخوارزمية ومدى تناسبها مع المشكلة قيد البحث بالإضافة إلى المجالات التطبيقية التي يدخل فيها هذا الحقل. • إدراك الطالب لأنواع المعالجات الخوارزمية وأهميتها. • تطوير إمكانية الطالب في تحليل الخوارزمية وبيان الوقت والمساحة التي تتطلبها في المشكلة • تطوير إمكانية الطالب على كتابة البرمجيات التي يتم تطويرها بأنواع خوارزميات مختلفة ومقارنة مدى فعالية كل واحدة منها	
81. استراتيجيات التعليم والتعلم	

الشرح باستخدام ادوات العرض الحديثة المختلفة- طريقة المحاضرة واستخدام السبورة التفاعلية

- تزويد الطلبة بالاساسيات والمواضيع الاضافية المتعلقة بتصميم وتحليل الخوارزميات و انظمتها - تكوين مجموعات نقاشية خلال المحاضرات لمناقشة الانظمة الحديثة والتي تتطلب التفكير والتحليل - الطلب من الطلبة مجموعة من الاسئلة التفكيرية خلال المحاضرات مثل ماذا وكيف ومتى ولماذا لمواضيع محددة - اعطاء الطلبة واجبات بيتية تتطلب تفسيرات ذاتية بطرق سببية

82. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
1	3		تعاريف و مقدمة عامة يتم خلالها شرح الملاحظات و التعليمات الواجب على الطلبة و الأستاذ الالتزام "ا لتحقيق افضل اداء من دراسة المادة	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري
2	3		Multimedia Software Tools	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري
3	3		Overview of Multimedia Software Tools	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري
4	3		Multimedia Production	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري
5	3		Multimedia Production	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري
6	3		Graphics/Image Data Types	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري
7	3		Gamma Correction	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري
8	3		Color Models in Video	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري
9	3		Chroma Subsampling	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري
10	3		Audio Digitization	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري
11	3		Audio Filtering	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري
12	3		Quantization and Transmission of Audio	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	اختبار شفهي او تحريري

اختبار شفهي او تحريري	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	Color Histogram		3	13
اختبار شفهي او تحريري	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	Texture Layout		3	14
اختبار شفهي او تحريري	محاضرة حضورية باستخدام الحاسوب وشاشة العرض مع القلم والسبورة	Image Retrieving		3	15
83.تقييم المقرر					
توزيع الدرجة من 100 على وفق المهام المكلف بها الطالب مثل التحضير اليومي والامتحانات اليومية والشفوية والشهرية والتحريرية والتقارير الخ					
84.مصادر التعلم والتدريس					
			الكتب المقررة المطلوبة (المنهجية أن وجدت)		
85.Introduction to Algorithms By Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Third Edition, 2009			المراجع الرئيسة (المصادر)		
			الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير.....)		
- Introduction To Design And Analysis Of Algorithms by Anany levitin, Pearson Edition, 2003 - Algorithm Desgin By Jon Kleinberg, Eva Tardos,2006			المراجع الإلكترونية ، مواقع الانترنت		

نموذج وصف المقرر

86.اسم المقرر الاحتساب التطوري
87.رمز المقرر 412COEC
88.الفصل / السنة الفصل الثاني / 2025-2026 فصلي
89.تاريخ إعداد هذا الوصف 2025/6/14
90.أشكال الحضور المتاحة حضور الزامي
91.عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي) 3 ساعة نظري لكل اسبوع / 3 وحدات

92. اسم مسؤول المقرر الدراسي (إذا أكثر من اسم يذكر)		
الاسم: أ.زياد طارق مصطفى الأيميل : ziyad1964tariq@uodiyala.edu.iq		
93.اهداف المقرر		
اهداف المادة الدراسية		ان هذا المنهج الاكاديمي هو مقدمة أساسية للتعلم ومعرفة خوارزميات البحث الجينية. الطالب سوف يتعلم العناصر الرئيسية للخوارزمية الجينية، مثل نظرية التطور، أنواع الخوارزميات الجينية؛ وكذلك خطوات الخوارزمية الجينية كالأختيار والترميز والأختيار والتزاوج والطفرة الوراثية. ويهدف المنهج الى:- 4. الهدف المطلوب من الطالب لكي يجتاز بنجاح متطلبات المقرر هو إدراك الطالب لخوارزمية البحث الجينية و أهمية استخدامها بالإضافة إلى المجالات التطبيقية التي تدخل فيها هذا الحقل. 5. إدراك الطالب لأنواع اطرق البحث وأنواعها. 6. تطوير إمكانية الطالب استخدام البرمجيات المتوفرة في هذا المجال بالإضافة إلى المهارات التي يكتسبها في مجال البرمجة الجينية والرياضيات الجينية.
94. استراتيجيات التعليم والتعلم		
الاستراتيجية	دراسة المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي). - متابعة التطور العلمي من خلال الاتصال بالجامعات العالمية عن طريق الانترنت - المشاركة في المؤتمرات العلمية داخل وخارج القطر - المشاركة في الورش والندوات العلمية داخل وخارج القطر - الزيارات الميدانية في المشاريع الصناعية و مؤسسات الدولة وشركات القطاع الخاص.	

10.بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة / أو الموضوع	طريقة التعليم	طريقة التقييم
1	3		Evolutionary Computation Introduction	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
2	3		Biological Evolutionary theory	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
3	3		Genetic Algorithms Types	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
4	3		Seeding the population and Encoding	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
5	3		Selection	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
6	3		Selection Types	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
7	3		Crossover	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
8	3		Crossover Types	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
9	3		Mutation	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
10	3		Mutation Types	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
11	3		Complete Example	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
12	3		TSP using Genetic	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
13	3		Routing using genetic	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
14	3		4 Queen puzzle using genetic	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
15	3		Genetic tutorial	محاضرة الكترونية باستخدام محرر مايكروسوفت	اختبار شفهي او تحريري
95.تقييم المقرر					
توزيع الدرجة من 100 على وفق المهام المكلف بها الطالب مثل التحضير اليومي والامتحانات اليومية والشفوية والشهرية والتحريرية والتقارير الخ					
96.مصادر التعلم والتدريس					
الكتب المقررة المطلوبة (المنهجية أن وجدت)			Machine Learning, Tom Mitchel McGraw Hill Press, 1997		

1- Fundamentals of genetic algorithms: Architecture, Algorithms, and Applications, LaureneFausett, 2002.	المراجع الرئيسية (المصادر)
- Practical Genetic Algorithms, Randy Haupt, 2004	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)
http://people.revoledu.com/kardi/tutorial/DecisionTree/how-to-usedecision-tree.htm	المراجع الإلكترونية ، مواقع الانترنت

نموذج وصف المقرر

1.	اسم المقرر: نظم تشغيل -كورس ثاني	
2.	رمز المقرر	
3.	الفصل / السنة فصلي / فصل ثاني	
4.	تاريخ إعداد هذا الوصف 2025/6/14	
5.	أشكال الحضور المتاحة حضوري	
6.	عدد الساعات الدراسية (الكلي)/ عدد الوحدات (الكلي) : 2 ساعة نظري -2 ساعه عملي/ 3 وحدة	
7.	اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر) الاسم: أ.د جمال مصطفى عباس الايمل : dr.altuwaijari@uodiyala.edu.iq	
8.	اهداف المقرر	ان هذا المنهج الاكاديمي اعد لتعريف الطالب بنظم التشغيل و تعريفها ،بنيتها ، تطورها ، ومهامها . وينتظر المقرر إلى هيكلة نظم التشغيل و دور نظم التشغيل ، تراكيب نظم التشغيل، العمليات و تزامنها، جدولة المهام، إدارة الذاكر الرئيسية و الافتراضية، و الاختناق و ادارة الذاكره و حمايتها، التزامن ، الترحيل ، التقسيم ، الذاكرة الافتراضية ويهدف المنهج الى:-
9.	استراتيجيات التعليم والتعلم	1- بناء معرفة أساسية لدى الطلاب عن نظم التشغيل و مبادئها و مفاهيمها الاساسية و انواعها. 2- تمكين الطلبة من اكتساب المهارات العقلية و المعرفية و التحليلية و الفهمية في مجال نظم التشغيل. 3- تمكين الطلبة من حل المشاكل المتعلقة بالاطار الفكري لادارة نظم التشغيل
10.	بنية المقرر	

اسم الوحدة / أو الموضوع	طريقة التعليم	طريقة التقييم	الأسبوع	الساعات	مخرجات التعلم المطلوبة
Deadlock, Deadlocks definition, Deadlock Necessary condition	محاضرة الكترونية باستخدام محرر مايكروسوفت	الاختبارات شفوية وتحريية يومية وواجبات بيئية بالإضافة الى الامتحانات الشهرية	1	2	الجمود
Deadlock detection and prevention	محاضرة الكترونية باستخدام محرر مايكروسوفت	الاختبارات شفوية وتحريية يومية وواجبات بيئية بالإضافة الى الامتحانات الشهرية	2	2	كشف الجمود والوقاية منه
Banker's Algorithm, Safety Algorithm	محاضرة الكترونية باستخدام محرر مايكروسوفت	الاختبارات شفوية وتحريية يومية وواجبات بيئية بالإضافة الى الامتحانات الشهرية	3	2	خوارزمية البنك و خوارزمية السلامة
Memory management	محاضرة الكترونية باستخدام محرر مايكروسوفت	الاختبارات شفوية وتحريية يومية وواجبات بيئية بالإضافة الى الامتحانات الشهرية	4	2	ادارة الذاكرة
Review of physical memory	محاضرة الكترونية باستخدام محرر مايكروسوفت	الاختبارات شفوية وتحريية يومية وواجبات بيئية بالإضافة الى الامتحانات الشهرية	5	2	عرض الذاكرة الفيزيائية
Memory management hardware	محاضرة الكترونية باستخدام محرر مايكروسوفت	الاختبارات شفوية وتحريية يومية وواجبات بيئية بالإضافة الى الامتحانات الشهرية	6	2	ادارة اجهزة الذاكرة
Memory protection	محاضرة الكترونية باستخدام محرر مايكروسوفت	الاختبارات شفوية وتحريية يومية وواجبات بيئية بالإضافة الى الامتحانات الشهرية	7	2	حماية الذاكرة
Synchronization	محاضرة الكترونية باستخدام محرر مايكروسوفت	الاختبارات شفوية وتحريية يومية وواجبات بيئية بالإضافة الى الامتحانات الشهرية	8	2	التزامن
Paging, Page Replacement	محاضرة الكترونية باستخدام محرر مايكروسوفت	الاختبارات شفوية وتحريية يومية وواجبات بيئية بالإضافة الى الامتحانات الشهرية	9	2	تقسيم الذاكرة الى صفحات و تبديلها

اختبارات شفوية و تحريرية يومية وواجبات يومية بالاضافة الى الامتحانات الشهرية	محاضرة الالكترونية باستخدام محرر مايكروسوفت	Demand Paging, Performance of Demand Paging	ترحيل الطلب، أداء ترحيل الطلب	2	10
اختبارات شفوية و تحريرية يومية وواجبات يومية بالاضافة الى الامتحانات الشهرية	محاضرة الالكترونية باستخدام محرر مايكروسوفت	Page Replacement Algorithms	خوارزميات تبديل الصفحات	2	11
اختبارات شفوية و تحريرية يومية وواجبات يومية بالاضافة الى الامتحانات الشهرية	محاضرة الالكترونية باستخدام محرر مايكروسوفت	Segmentation	تقسيم الذاكرة الى اجزاء متغيره	2	12
اختبارات شفوية و تحريرية يومية وواجبات يومية بالاضافة الى الامتحانات الشهرية	محاضرة الالكترونية باستخدام محرر مايكروسوفت	Virtual memory	الذاكرة الافتراضية	2	13
اختبارات شفوية و تحريرية يومية وواجبات يومية بالاضافة الى الامتحانات الشهرية	محاضرة الالكترونية باستخدام محرر مايكروسوفت	Thrashing	Thrashing	2	14
اختبارات شفوية و تحريرية يومية وواجبات يومية بالاضافة الى الامتحانات الشهرية	محاضرة الالكترونية باستخدام محرر مايكروسوفت	File system security	أمن نظام الملفات	2	15

تقييم المقرر		11
توزيع الدرجة من 100 على وفق المهام المكلف بها الطالب مثل التحضير اليومي والامتحانات اليومية والشفوية والشهرية والتحريرية والتقارير الخ بالاضافة الى الامتحانات العملية		
مصادر التعلم والتدريس		12
لا يوجد	المقررة المطلوبة (المنهجية أن وجدت)	الكتب
Operating System Concepts. By Silberschtz and Galvin	المراجع الرئيسية (المصادر)	المراجع الرئيسية (المصادر)
Operating Systems, by Harvey M. Deitel, Paul J. Deitel, and David R. Choffnes.	والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير)	الكتب والتقارير
http://www.deitel.com/Books/OperatingSystems/	مواقع الانترنت	المراجع الإلكترونية ، مواقع الانترنت

مسار بولونيا

المرحلة الأولى الكورس الأول مسار بولونيا

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Differentiation Methods		Module Delivery	
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	COS-101			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	U	Semester of Delivery		
Administering Department	COM	College	COS	
Module Leader	Sarab dawood shukur		e-mail	Sarabdawood@uodiyala.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification		master
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	04/06/2025		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Evaluate limits (as part of Departmental Objectives in Mathematics) 2. Prove basic theorems using limits of the difference equation 3. Differentiate algebraic and trigonometric functions using key 4. Find the tangent line to a given graph at a given point

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this course, students will: 1. Solve tangent and area problems using the concepts of limits, derivatives, and integrals. 2. Draw graphs of algebraic and transcendental functions considering limits, continuity, and differentiability at a point. 3. Determine whether a function is continuous and/or differentiable at a point using limits. 4. Use differentiation rules to differentiate algebraic and transcendental functions.
Indicative Contents المحتويات الإرشادية	• Limits and Continuity Limit of a function, evaluation of limits, continuity. • Differentiation Derivative of a function, rules of differentiation, higher derivatives.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Develop an effective and time-efficient homework/study strategy for, not only your calculus class, but other classes as well. This will help you become a more confident, successful, and well-rounded student. It will lead to a healthier balance between work time and leisure time. Spend at least two to four hours on each homework assignment. This affords you extra time to work on challenging homework problems and helps you organize your thoughts, questions, and ideas. The more time you spend on homework, the more likely you are to articulate clear, concise questions to your classmates and teachers. The more time you spend on homework, the less time you will spend on frantic, last-minute preparation for exams. Definitions, formulas, and theorems that are introduced in class or needed to complete homework assignments should be memorized immediately. Postponing this until it's needed for the exam will impede your work speed on homework assignments and interfere with clearer and deeper understanding of calculus. Spend time working on calculus every day. Doing some calculus every day makes you more familiar with concepts, definitions, and theorems. This familiarity will make calculus get easier and easier one day at a time. Find at least one or two other students from your calculus class with whom you can regularly do homework and prepare for exams. Your classmates are perhaps the least used and arguably your best resource. An efficient and effective study group will streamline homework and study time, reduce the need for attendance at office hours, and greatly improve your written and spoken communication. The best time to use your classmates as study/homework partners is after you have made an honest effort on your own to solve the problems using your own wits, knowledge, and experience. When you encounter an unsolvable problem, don't give up too soon on it. Being stumped is an opportunity for mathematical growth and insight, even if you never solve the problem on your own. If you seek help prematurely, you will never know if you could have solved a tough problem without outside assistance. Begin preparing/outlining for exams at least five class days before the exam. Outlining the topics, definitions, theorems, equations, etc. that you need to know for the exam will help you focus on those areas where you are least prepared. Preparing early for the exam will build your self-confidence and reduce anxiety on the day of the exam. It's also an insurance policy against time lost to illness, unexpected family visits, and last-minute assignments in other classes. Generally speaking, pulling all-nighters and doing last-minute cramming for exams is a recipe for eventual academic disaster.

	Prepare for exams by working on new problems . Good sources for these problems are unassigned problems from your textbook, review exercises and practice exams at the end of each chapter, old hour exams, or old final exams. Studying exclusively from those problems which you have already been assigned and worked on may not be effective exam preparation . Problems for each topic are generally in the same section of the book, so knowing how to do a problem because you know what section of the book it is in could give you a false sense of security. Working on new randomly mixed problems more closely simulates an exam situation, and requires that you both categorize the problem and then solve it. Use all resources of assistance and information which are available to you. These include classnotes, homework solutions, office hours with your professor or teaching assistants, and problem sessions with your classmates. Do not rely exclusively on just one or two of these resources. Using all of them will help you develop a broader, more natural base of knowledge and understanding. Expect your exams to be challenging . If they are challenging, you will be prepared. If they are not challenging, you can expect to have an easy time getting a very high score!
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	67	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	58	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Abbreviations and Notations
Week 2	Some trigonometric, Slope, Graph and function
Week 3	Limits: The Idea of Limits. Definitions of Limits. Techniques for Computing Limits.
Week 4	Limits and Continuity: Infinite Limits. Limits at Infinity. Continuity. Precise Definitions of Limits
Week 5	Differentiation: Introducing the Derivative. The Derivative as a Function. Rules of Differentiation
Week 6	Differentiation: The Product and Quotient Rules. Derivatives of Trigonometric Functions. Derivatives as Rates of Change.
Week 7	Differentiation: The Chain Rule,
Week 8	Differentiation Implicit Differentiation
Week 9	Differentiation: The Chain Rule, Implicit Differentiation Part 1
Week 10	Differentiation: The Chain Rule, Implicit Differentiation Part 2
Week 11	Differentiation: Derivatives of Inverse Trigonometric Functions. Related Rates. Part 1
Week 12	Differentiation: Derivatives of Inverse Trigonometric Functions. Related Rates. Part 2
Week 13	Applications of Derivatives: Maxima and Minima. Mean Value Theorem. What Derivatives Tell Us part 1
Week 14	Applications of Derivatives: Maxima and Minima. Mean Value Theorem. What Derivatives Tell Us part 2
Week 15	Review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Edwards, C.H. and Penney, D.E. Elementary Differential Equations. Prentice-Hall. (latest ed.).	Yes
Recommended Texts	Thomas, G. and Finney, R. Calculus and Analytic Geometry. Addison-Wesley. (latest ed.).	Yes

	Adams, R. Single Variable Calculus. Pearson Education. (latest ed.).	
Websites		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Computer Skills (I)			Module Delivery
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	COM-113			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	U			
Administering Department		COM	College	COS
Module Leader	:muntadher Khamees mustafa Name		e-mail	E-mail alkarawis@gmail.com
Module Leader's Acad. Title	Assist. Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2025		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Students will explore and become more familiar with: 1. The concepts of Information & Communication Technology (ICT) and applications.

	- The operating systems such as Windows, Android, IOS, Linux, DOS and application software such as Word and Electronic Spreadsheets. - The continuous exchange of data between any two parts of the world. - Data visualization using different tools and applications. - The general programming concepts and related problem-solving strategies. - The design and development of applications using simple software/programming language. - The basic principles of information security.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon the completion of the course, students will be able to: - The students will have the knowledge to understand the peripheral devices, computer system and the different types of software and skills for managing visual elements, document sources, developing project reports, assignments etc. Which are mandatory at this level of academics. - The students will have the knowledge and skills to create presentations that include academic project presentations, seminars, professional-grade presentations, employee training manuals, instructional materials, and kiosk slideshows. - The students will have the knowledge of the importance of data analysis as a part of strategic growth, allowing students to forecast trends and required actions. - Students will have the knowledge of working independently as well as with a group to deliver effective and well- documented software solutions to all problems. - Students will have the knowledge of the importance Artificial Intelligence, as well as various applications of Internet of Things that are widely used in the field of computing technologies. - Students can apply skills by working and completing software-related activities such as MS Word, MS Excel, MS PowerPoint and Python - Mastering the skills taught throughout the course will improve the productivity and the way students are conducting and presenting their work. This course provides students with the basic knowledge and skills that allow them to use different kinds of computer applications.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - Introduction To Course - Computing Basics and Text Processing Essentials - Presentation Graphics Essentials - Data analysis and Dashboard Technique (- Algorithm and Python Programming concepts - Advanced Computing Technologies - Self-Learning(Elective) - Others (Exam, PCA)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

The class will "meet" the equivalent of two one-hour & fifteen minutes for lecture/discussion each week.

The lectures and discussions will be a combination of synchronous and asynchronous discussions using WebCT.

Students must have access to the Internet to facilitate demonstrating and using software.

Many of the assignments should stress hands-on applications by the students. Each student will be expected to participate in all lectures. Class participation by all is expected.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	66	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	34	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	and 124	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1, #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction
Week 2	Components of Computer System
Week 3	Concept of Hardware and Software

Week 4	Concept of computing, data and information
Week 5	Connecting keyboard, mouse, monitor and printer to CPU
Week 6	Basics of Operating System
Week 7	mid exam
Week 8	Basics of popular operating system (LINUX, WINDOWS)
Week 9	Operating System Simple Setting
Week 10	File and Directory Management
Week 11	Basic of Computer Networks
Week 12	Popular Web Browsing Software
Week 13	Basics of E-mail
Week 14	Data security
Week 15	Document collaboration

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Knowing computer
Week 2	Operating Computer using GUI Based Operating System
Week 3	network and Operating Computer using GUI Based Operating System
Week 4	Managing files and folders
Week 5	Basic networking
Week 6	Operating System Simple Setting
Week 7	Exam
Week 8	File and Directory Management
Week 9	Basic of Computer Networks
Week 10	Popular Web Browsing Software
Week 11	Basics of E-mail
Week 12	Image editing
Week 13	Simple computer programming concepts
Week 14	Simple computer programming concepts
Week 15	Data security

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Textbooks	Computer Skills	Yes

Essential References Materials	LMS Black Board.	No
Electronic Materials	Electronic Materials	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Computational Mathematics			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	COM-112				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	U		Semester of Delivery		
Administering Department	COM		College	os	
Module Leader	Khalid M.S. Al Zaidi		e-mail	dr.khaledmoh@uodiyala.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		Module Leader's Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/09/2026		Version Number	4	

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	5. The principal objective of this course is to develop the analytic skills need to learn mathematics. 6. Studying basic mathematical concepts to solve problems. 7. To understand analyze systems in a mathematical manner.

	8. This course deals with the basic concept of computational mathematics. 9. This is the basic subject for most computer science subjects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least twelve Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize the basic concepts in a computational mathematics structure. 2. To understand the fundamental properties of sets. 3. Identify the basic sets operations. 4. To study the sets types and counting principle. 5. Recognize the relations and functions to describe the relationship between the elements from two sets. 6. To learn several basic proof techniques. 7. Discuss the proof techniques to prove important results in set theory. 8. To studies properties of integers and use the proof techniques to prove some basic facts in number theory. 9. To understand the fundamental properties of graph. 10. To study how representation of functions by using graph. 11. Discuss the types of graphs and special graph. 12. Explain the Polish notation.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: 1. <u>Sets</u> • The basic concepts • Set Operations • Finite sets, counting principle • Classes of sets • Partitions of set 2. <u>Relations</u> • <u>Representation of relations</u> • <u>Properties of relations</u> • <u>Inverse relations</u> • <u>Composition of relations</u> 3. <u>Function</u> • <u>One-to-one, onto and invertible functions</u> • <u>Graph of a function</u> • <u>Composition of function</u> 4. <u>Graphs</u> • <u>Degree</u> • <u>Connectivity</u> • <u>Special graph</u> • <u>Matrices and graphs</u> • Labeled graphs • Tree • Polish notation

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	computational mathematics is foundational material for computer science: Many areas of computer science require the ability to work with concepts from computational mathematics, specifically material from such areas as set theory, logic, graph theory, combinatorics, and probability theory. The main strategy that will be adopted in delivering the computational mathematics structures module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. The module will include a combination of classes, and interactive tutorials.
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	52	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	73	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - The basic concepts
Week 2	Sets
Week 3	Set Operations
Week 4	Set Operations
Week 5	Finite sets, counting principles

Week 6	Cardinality
Week 7	Mid-term Exam
Week 8	Inverse relations
Week 9	Function
Week 10	Graph of a function
Week 11	Graphs
Week 12	Graphs
Week 13	Connectivity
Week 14	Special graph
Week 15	Polish notation
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library
Required Texts	- Discrete mathematical structures for computer science by Bernard Kolman & Robert C. Busby	Yes
Recommended Texts	- Theory and problems of Discrete mathematics, by Seymour Lipschutz & Marc Lars Lipson, Schaum's Outline Series, third edition 2007. - Mathematical foundation of computer science, Y.N. Singh, 2005. - Discrete Mathematics and Its Applications, Seventh Edition, Kenneth H. Rosen, AT&T Laboratories, 2012.	Yes
Websites	http://www.math.uvic.ca/faculty/gmacgill/guide http://en.wikibooks.org/wiki/Discrete_mathematics/Set_theory	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Digital Logic			Module Delivery
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	COM-114			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level		Semester of Delivery		
Administering Department	COM	College		
Module Leader	Yahiea M.H. Al Naiemy		e-mail	Yahiea.alnaiemy@uodiyala.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2025		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This is core course of Computer Science Department and that presents basic tools for the design of digital circuits. It serves as a building block in many disciplines that utilize data of digital nature like digital control, data communication, digital computers etc. The goal of this course is to;

	1. Perform arithmetic operations in many number systems. 2. Manipulate Boolean algebraic structures. 3. Simplify the Boolean expressions using Karnaugh Map (K-MAP). 4. Implement the Boolean Functions using NAND and NOR gates. 5. Analyze and design various combinational logic circuits such as (Binary Adder and Subtractor, Multiplexer, Decoder, Programmable Logic Array (PLA)). 6. Understand the basic functions of Flip-Flops. 7. Understand the importance of state diagram representation of sequential circuits. 8. Analyze and design clocked sequential circuits such as Counters and Registers.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course makes significant contributions to the following program outcomes: 1. An ability to apply knowledge of mathematics, science, and engineering, 2. An ability to design and conduct experiments, as well as to analyze and interpret data, 3. An ability to design a system, component, or process to meet desired needs within realistic constraints 4. An ability to identify, formulate, and solve Science and engineering problems, 5. An ability to use the techniques, skills, and modern engineering tools necessary for Computer and Engineering practice.
Indicative Contents المحتويات الإرشادية	1. Digital Systems and Binary Numbers • Digital Systems, • Binary Numbers, • Number-base Conversions, • Octal and Hexadecimal Numbers, • Complements, • Signed Binary Numbers, • Binary Codes, Binary Storage and Registers, • Binary Logic. 2. Boolean Algebra and Logic Gates: • Introduction, • Basic Definitions, • Axiomatic Definition of Boolean Algebra, • Basic Theorems and Properties of Boolean Algebra, • Boolean Functions, • Canonical and Standard Forms, • Other Logic Operations, • Digital Logic Gates, • Integrated Circuits. 3. Gate level Minimization: • The Map Method, • Two-variable map, • Three-variable map, • Four-Variable Map, • Five-variable Map, • Product of Sums Simplification, • Don't-care Conditions, • NAND and NOR Implementation, • Other Two-Level Implementations, • Exclusive-OR and NOR Function. 4. Combinational Logic: • Introduction, • Combination Circuits, • Analysis Procedure, • Design Procedure, • Binary Adder-Subtractor, • Decimal Adder,

	• Binary Multiplier, • Magnitude Comparator, • Decoders, • Encoders, • Multiplexers and DeMultiplexers. 5. Synchronous Sequential Logic: • Introduction, • Sequential Circuits, • Storage Element: • Latches, • Storage Element: Flip-Flops, • Analysis of Clocked Sequential Circuits, • State Reduction and Assignment, • Design Procedure. • Synchronous Counter Design • Design Sequential Logic: Shift Registers.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering the logic design module is to engage students actively in practical exercises to enhance their understanding and develop their critical thinking skills. The module will include a combination of classes, interactive tutorials, and hands-on experiments focused on sampling activities that capture students' interest. Through interactive classes, students will be introduced to the theoretical foundations of logic design, including explain digital system concept. express analog to digital conversion, use binary number system, realize conversion between various number systems, design fundamental digital systems, recognize logic gates, apply Boolean algebra, employ Karnaugh map for digital system optimization, develop combinational logic circuits such as adder, subtractor, encoder, decoder, multiplexer and demultiplexer. And recognize types of Flip-flops, design sequential logic circuits. Analyze fundamental digital systems, calculate input - output relationship in digital systems, and recognize state diagrams and tables, analyses sequential logic circuits To reinforce learning and encourage active participation, interactive tutorials will be conducted. These tutorials will involve hands-on exercises where students will work with real-world design and apply different design techniques. This practical approach will help students grasp the practical implications of the theoretical concepts discussed in the classes. In addition to tutorials, simple experiments will be introduced to provide students with opportunities to explore various sampling activities. These experiments will focus on real-life scenarios and problems related to digital design . Students will be encouraged to think critically, analyze the results, and propose solutions based on their understanding of the concepts learned. The module will also emphasize the importance of collaboration and teamwork. Students will be encouraged to work together on projects and assignments, fostering
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a collaborative learning environment where they can exchange ideas and learn from each other's perspectives.

Overall, the module's delivery approach aims to actively engage students, refine their critical thinking skills, and provide them with practical experiences in digital design . By combining theoretical knowledge with hands-on activities, students will develop a deeper understanding of logic design concepts and their applications in various fields.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	95	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	55	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction –Logic Design and its applications
Week 2	Arithmetic Operations
Week 3	Logic Gates
Week 4	Simplification and Boolean Functions
Week 5	Logic Operations
Week 6	Combinational and Sequential Circuit Analysis Design
Week 7	Mid-term Exam

Week 8	Digital Circuit Design Optimization Methods
Week 9	Binary Adder and Subtractor
Week 10	Multiplexer, Decoder, PLA
Week 11	Types of RAMs, ROMs
Week 12	Programmable Logic Arrays
Week 13	Flip-Flops
Week 14	Counters
Week 15	Registers
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Digital binary representation
Week 2	Lab 2: Basic Gates Electronic Workbench
Week 3	Lab 3: Two input SOP and Two input POS
Week 4	R-S flip-flop. J - K flip-flop, T Flip-Flop, D Flip-Flop
Week 5	Lab 5: - Implementation and verification of decoder, de-multiplexer and encoder, using logic gates.
Week 6	Lab 6: Implementation of 4x1 multiplexer, using logic gates.
Week 7	Lab 7: Implementation of 4-bit parallel adder, using 7483 IC
Week 8	Lab 8: Design, and verify the 4-bit synchronous counter.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	M. Morris Mano, "Computer System Architecture", 1998.	Yes
Recommended Texts	- Donald D. Givone (2002), Digital Principles and Design, Tata McGraw Hill. - Roth (2004), Fundamentals of Logic Design, 5th Edition, Thomson.	No
Websites	https://www.circuitlab.com/editor/#?id=7pq5wm&from=homepage https://circuitverse.org/simulator	

Grading Scheme

مخطط الدرجات

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

	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Introduction to Programming			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	COM-111				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level		Semester of Delivery			
Administering Department	COM		College	COS	
Module Leader	Hassan Hadi Saleh		e-mail	Hassan.hadi@uodiyala.edu.iq	
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2025		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The educational objectives of this course are 1- To Focus Fundamentals of Computers and Peripherals 2- To Introduce programming language and aware the students about programming paradigm 3- To Focus Concept and Methodology of Programming 4- Brief the students regarding Object Oriented Programming Features 5- To give clear idea of different strategy of basic programming with C like Looping, Decision Making, Array, Structure, Function, Pointer, etc. to solve real life problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- On successful completion of the course, the student will be having the basic knowledge of programming paradigm, fundamentals of compute and peripherals and thus being prepared with the programming spectrum in depth as desired. 2- Student will be able to effectively solve any real-life problem and lead the exploration of new application and techniques for their use.
Indicative Contents المحتويات الإرشادية	• Introduction to Computer Programming • Basics of C++ language • Problem Solving and Algorithm Design • Pseudo-codes and Flow charts • Arithmetic Operators and Variables • Exploring input and output statements • Control Structure (Selection and iterative) ◦ Functions • Primary data structure of Arrays and its multi – dimensional behavior. ◦ Concepts of Pointers • Introductory knowledge of Structures

Learning and Teaching Strategies			
استراتيجيات التعلم والتعليم			
Strategies	• Lectures • Tutorials • Problem solving • Lab • Case study • Small project		
Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	109	Structured SWL (h/w)	7
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	91	Unstructured SWL (h/w)	6

الحمل الدراسي غير المنتظم للطلاب أسبوعيا		الحمل الدراسي غير المنتظم للطلاب خلال الفصل
Total SWL (h/sem)		200
الحمل الدراسي الكلي للطلاب خلال الفصل		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to programming and problem solving Programs and programming languages; the role of a compiler; the input-process-output model. Identify the required result and outline a solution using familiar examples such as an average or an area.
Week 2	Algorithms and pseudocode Meaning and basic properties of an algorithm; ordered steps, clear instructions and termination. Write pseudocode for adding two numbers, calculating a rectangle area and finding an average. Trace solutions manually.
Week3	Flowcharts Start/end, input/output, process, decision and flow arrows. Draw sequential and simple decision flowcharts. Label decision branches and trace normal and boundary inputs. Relate a flowchart to its pseudocode.
Week 4	Writing the first C++ program Editor, compiler and program execution; source files; #include <iostream>, main, braces, semicolons, comments and cout. Edit, compile and run a small program. Recognise common syntax errors.
Week 5	Variables and input and output

	Identifiers, declaration, initialisation and assignment. Use int, double, char and bool; introduce const. Read values using cin and display labelled results using cout. Choose suitable types for simple problems.
Week 6	Operators and expressions Arithmetic operators, remainder, precedence and parentheses; integer and floating-point division; simple type conversion. Introduce relational and logical operators using small expressions and predict their results.
Week 7	Simple conditional statements Use if and if/else. Form conditions with relational and logical operators; distinguish assignment from comparison. Convert decision flowcharts to code for pass/fail, even/odd and the larger of two values.
Week 8	Multiple and nested decisions Use else-if chains and simple nested if statements. Classify a grade and find the largest of three numbers. Check equality and boundary cases. A separate midterm examination covers Weeks 1-7.
Week 9	Introduction to programming and problem solving Programs and programming languages; the role of a compiler; the input-process-output model. Identify the required result and outline a solution using familiar examples such as an average or an area.
Week 10	Selection using switch Use switch, case, break and default with integer or character choices. Compare switch with if/else. Develop a basic menu-driven calculator and handle a zero divisor. Submit Assignment 2.
Week 11	Repetition using while Loop initialisation, condition and update; counters and accumulators. Trace a loop with a table and flowchart. Compute the sum from 1 to n and count values. Recognise an infinite loop.
Week 12	Repetition using do while Post-test loops and at least one execution. Compare while and do/while; repeat a menu and validate a numeric range. Use a sentinel value to terminate repeated input.
Week 13	Repetition using for Count-controlled loops; initialisation, test and update. Print a multiplication table, compute a total and process a sequence of inputs. Introduce break and continue through short traced examples.
Week 14	Nested loops and integrated practice Use simple nested loops to print a small table or pattern. Combine selection and repetition in a small program. Check loop boundaries and compare expected with actual results.
Week 15	Introduction to using functions Why functions are useful; function names, arguments and returned values. Use simple library functions such as sqrt and pow with <cmath>. Distinguish calling a function from defining one.
Week 16	Introduction to writing functions and review

	Read, define and call a simple function such as square(int x). Identify its return type, parameter, body and return statement. Trace the call from main and review the semester. Detailed function study begins in Programming II.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Problem analysis and environment
Week2	Algorithms and dry runs
Week 3	Flowchart construction
Week 4	First C++ program
Week 5	Variables and console input
Week 6	Expressions and operators
Week 7	if and if else
Week 8	else if and nested if
Week 9	switch selection
Week 10	while loops
Week 11	do while and validation
Week12	for loops
Week 13	Nested loops and testing
Week 14	Library functions
Week 15	A simple user-defined function

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Deitel & Deitel, 2017, "C++ How to Program", Tenth Edition, Pearson Education. D. S. Malik, 2018, "C++ programming from Problem Analysis to Program Design", Eighth Edition, Cengage Learning.	Yes

Recommended Texts	Stanley B Lippman; Josée Lajoie; Barbara E, 2013, "C++ PRIMER", 5th Edition, Addison Wesley	No
Websites	1- http://www.cplusplus.com/ 2- https://www.w3schools.com/cpp/	

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

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>English Language</u>		Module Delivery	
Module Type	<u>Basic learning activities</u>		☒ Theory ☒ Lecture ☐ Lab ☐ L Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>11UD</u>			
ECTS Credits	<u>2</u>			
SWL (hr/sem)	<u>50</u>			
Module Level	1	Semester (s) offered		
Administering Department	All Departments	College	College of Science	
Module Leader	م.د. رافد عبد اللطيف معين		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	PhD	
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	522/11/202	Version Number	1.0	

Relation with Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes, Indicative Contents and Brief Description			
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر			
Module Aims	The module aims to develop the students' English skills in reading, writing, listening and speaking.		
أهداف المادة الدراسية			

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Read and understand simple texts in English. 2. Answer simple comprehension questions and match sentences about texts. 3. Reconstruct texts by reordering sentences. 4. Understand the main idea of a text. 5. Identify specific information in a text. 6. Writing and paraphrasing paragraphs.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: i) Grammar has a core place in language teaching and learning. ii) A wide variety of practice tasks in all the four skills are essential to language learning. iii) Everyday expressions, particularly of spoken English, also need a place in the syllabus. These can be functional, social, situational or idiomatic.
Course Description	Each unit is organized to enhance students' basic knowledge of vocabulary and grammar through reading texts. The students will learn how to form simple sentences and use them in real life situations as well as in writing different assignments. By the end of the course, students will be able to produce basic sentences and communicate in simple real-life situations.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Headway's trusted methodology combines solid grammar and practice, vocabulary development, and integrated skills with communicative role-plays and personalization. Authentic material from a variety of sources enables students to see new language in context, and a range of comprehension tasks, language and vocabulary exercises, and extension activities practice the four skills. 'Everyday English' and 'Spoken grammar' sections practice real-world speaking skills, and a writing section for each unit at the back of the book provides models for students to analyze and imitate.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية					
		Time (hr)	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (5)	5, 10, 12, 15	All
	Assignments	6	20% (20)	2, 4, 6, 8, 10, 12	LO # 1, 3, 4, 5 and 6
	Seminars	2	5% (5)	Continuous	LO # 1-5
Summative assessment	Midterm Exam	2	20% (10)	7	LO # 1-3
	Final Exam	3	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	MAIN COURSE SPEAKING, LISTENING, VOCABULARY GRAMMAR, READING, am/is/are my/your This is... Introduction dialogues, Everyday English dialogues Introductions, Good morning! Practicing introduction dialogues. People meet each other and introduce someone else. How are you? What's this in English? Numbers 1-10 and plurals.
Week 2	He/she/they His/her. Questions Where are they from? Two people are on holiday in New York. Students ask and answer questions about where people are from. Countries, Numbers 10-20, 11-30. A set of cities and countries: Brazil, Spain... Adjectives: awful, really good, fantastic, beautiful Nouns: centre, hospital, building, park
Week 3	Verb to be is recycled and extended to include negative and question forms. We're in Las Vegas! Roleplay: in a band. An interview with the band Metro 5. Jobs: a nurse, a doctor. Personal information: surname, first name, address, married ... Social expressions: I'm sorry, thanks, please...
Week 4	Possessive adjectives. Possessive 's. Has/ have Adjective + noun Irregular Plurals Paddy McNab and his family, My best friend. The alphabet, On the phone, Saying email addresses. Who are they? Listen and identify the people. The family: mother, son. Describing a friend: very beautiful, really funny...
Week 5	Present Simple: I/you/we/they a/an Adjective + noun Colin Brodie from Dundee. Role play: At a party. Where is Colin? Who is he with? At a party: Flavia and Terry are at a party in London. The lexical set of sports/food/drinks. Languages and nationalities.
Week 6	Present Simple: He/she Question and negatives Adverbs of frequency Prepositions of time Lois Maddox Talking about daily routines, Asking and answering questions about daily routines, Lifestyle questionnaire Listening a phone conversation between Lois and Elliot. Days of the week. The time. Words that go together: watch TV, get up early...
Week 7	Question words Subject Pronouns Object Pronouns Possessive Pronouns This and that A postcard from San Francisco, A holiday postcard. Describing lifestyles, preferences and places, Roleplay: conversations in town. Listening the requests with Can I.....? Adjectives: lovely, terrible, comfortable, friendly... Opposite adjectives: new/old, big/small Places: chemist, post office

Week 8	There is /are Prepositions: in, on, under, next to Vancouver-the best city in the world, What to do and where to go. Talking and asking about rooms and furniture, Giving directions. My home town, Steve talks about living in Vancouver. Rooms and furniture: living room, bedroom ... In and out of town: beach, mountain, sailing...
Week 9	Was/were born Past simple: irregular verbs It's a Jackson Pollock. Telling a story from pictures, Saying the dates in English. Magalie Dromand, Magalie dromand talks about her family. Saying years People and jobs Irregular verbs Have, do, go: have lunch, do homework, go shopping
Week 10	Past simple: regular and irregular Questions Negatives Ago Dialogues with simple past. Did you have a good weekend? Asking about holidays, A questionnaire, My last holiday, Roleplay: asking and giving directions. Angie and Rick are at work, Jack and Millie's holiday. Weekend activities: go to the cinema, have a meal... Time expressions: on Monday, last night... Sports and leisure: tennis, skiing, windsurfing... Play or go: play tennis, go skiing... Seasons: winter, summer...
Week 11	Can / can't, Adverbs, Adjective + noun Requests and offers The Internet, what can you do on the internet? Talking about what you can do, talking about everyday problems, Five people talk about what they do on the internet. Verbs: draw, run, drive... Verb noun: Listen to the radio, chat to friends Adjective noun: fast car, busy city, dangerous sport Opposite adjectives: dangerous/ safe, old/modern, old/young.
Week 12	I'd like, You are what you eat, Discussion-what is a good diet? Conversation with Adam, Shopping: bread, milk, fruit, Please and thank you Some /any, Like and would like People from different parts of the world describe what they eat. Roleplay: Ordering a meal. Birthday wishes, what people want on their birthday. stamps, cheese, ham... Food: cereal, salad, pasta, fish... In a restaurant: menu, starter, desert, soup, salmon
Week 13	Present continuous, Present simple and present continuous. This week is different, Colin, a millionaire, gives money to homeless teenagers What's the matter? Why don't you? What is Nigel wearing? Nigel is on holiday, What's the matter. Colors: blue, red, green... Clothes: jacket, trousers, shoes and socks... Opposite verbs: buy/sell, love/hate, open/close...
Week 14	Future plans, Revision: question words, tenses. Seven countries in seven days, Life's big events: three people talk about their family, education, work and ambitions. A mini autobiography. Eddie is talking to a friend about his holiday plans, social expressions Transport: travel by bus, coach, motorbike, plane... Revision
Week 15	Irregular verbs, phonetic symbols, consonants and vowels.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	New Headway Beginner, by Liz and John Soars Cotton D., Falvey D., Kent S. Market Leader. Intermediate Business English. Longman, 2001.	Yes
Websites	https://www.learnenglish.de/ https://www.englishgrammar.org/ https://www.phrasebank.manchester.ac.uk/	

GRADING SCHEME

مخطط الدرجات

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

Note:

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

المرحلة الأولى الكورس الثاني مسار بولونيا

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Computer Organization</u>		Module Delivery	
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>COM-123</u>			
ECTS Credits	<u>6</u>			
SWL (hr/sem)	<u>150</u>			
Module Level	U			
Administering Department	Comp		College	CD
Module Leader	Bashar Talib AL-Nuaimi		e-mail	alnuaimi_bashar@uodiyala.edu.iq
Module Leader's Acad. Title	Prof.		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2025		Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-113	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- To impart basic concepts of computer architecture and organization, 2- To explain key skills of constructing cost-effective computer systems. 3- To familiarize the basic CPU organization. 4- To help students in understanding various memory devices. 5- To facilitate students in learning IO communication

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Identify various components of computer and their interconnection 2- Identify basic components and design of the CPU: the ALU and control unit 3- Compare and select various Memory devices as per requirement. 4- Compare various types of IO mapping techniques 5- Critique the performance issues of cache memory and virtual memory
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. The module focuses on computer system hardware and how it is used to facilitate the execution of software, including topics such as data representation, digital logic, assembler, memory systems, I/O and microprocessor architecture. The aim of the module is to provide students with an understanding of the functional components of a computer system and how they are organized to facilitate execution. Student will also gain a range of practical skills in the application and construction of computer components that are capable of interfacing with microprocessors. This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ. Data Representation: Analog and digital data; number systems including number representations and conversions; binary variables including logic expressions and simplifications of binary variables; binary arithmetic, signed numbers; arithmetic structures, multiple precision arithmetic, Microprocessor architecture; instruction cycles, register transfer language (RTL); instruction set and addressing modes; assembly and machine code programming. Input/Output Mechanisms: Parallel I/O; memory-mapped and programmable I/O devices, eg VIA; I/O scheduling including programmed I/O, interrupt driven I/O, direct memory access (DMA); analog I/O. Memory systems: Motivation for memory hierarchy; devices including magnetic tape, floppy disks, disk formats, hard disks, optical data storage; elementary error detection and correction. Processor Architecture: Example combination of ALU, registers, and CPU; instruction set construction; control units including hardwired and microprogrammed control units.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved

	through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to computer systems Main parts of computer system, organization and architecture
Week 2	Von Neumann architecture
Week 3	Computer generations
Week 4	Data presentation
Week 5	Introduction to Computer components (motherboard components in details (i.e cpu and memory details))
Week 6	INPUT OUTPUT SYSTEM: I/O Devices, Video Color Models
Week 7	CPU, CPU basic organization, Control units
Week 8	MEMORY SYSTEM, Memory hierarchy,

Week 9	Mid-term Exam
Week 10	Cache memory, Primary memory, Secondary memory, memory addressing,
Week 11	Semiconductor RAM Memories, Read Only Memories, Speed, Size, and Cost,
Week 12	Introduction to Secondary Storage
Week 13	Hard disk and magnetic drive
Week 14	Computer s/w
Week 15	Machine language, high level language
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1 Introduction to computer systems
Week 2	Lab 2: Overview of computer hardware and software
Week 3	Lab 3: Introduction to windows
Week 4	Lab 4: Shortcuts and Start menu.
Week 5	Lab 5: Open WordPad from the shortcut on the desktop. Open WordPad from the Start menu
Week 6	Lab 6: Introduction to Notepad and WordPad. Typing a letter. Opening a file and saving a file
Week 7	Lab 7: Opening a text document from a CD. Correcting a text document
Week 8	Lab 8: Mid-term Exam
Week 9	Lab 9: Working with multiple windows.
Week 10	Lab 10: Creating a folder and saving a document to that folder. Deleting a file. The Recycle Bin.
Week 11	Lab 11: formatting windows
Week 12	Lab 12: Desktop Customizations
Week 13	Lab 13: Control Panel
Week 14	Lab 14: Internet and Computer Networks
Week 15	Preparatory week before the final Exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Computer Architecture: A Quantitative Approach (5th edition) by J.L. Hennessy and D.A. Patterson (Morgan Kauffmann Publishers)	Yes
Recommended Texts	Computer System Architecture by M. Morris Mano (Pearson Publication)	No
Websites	https://www.youtube.com/watch?v=Ol8D69VKX2k&t=145s	

Grading Scheme

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information						
معلومات المادة الدراسية						
Module Title	<u>Discrete Structures</u>		Module Delivery			
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar			
Module Code	<u>COM-122</u>					
ECTS Credits	<u>6</u>					
SWL (hr/sem)	<u>150</u>					
Module Level	Undergraduate	Semester of Delivery		2		
Administering Department	Computer Science	College	College of Science			
Module Leader	Khalid M.S. Al Zaidi		e-mail	dr.khaledmoh@uodiyala.edu.iq		
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Ph.D.		
Module Tutor	Name (if available)		e-mail	E-mail		
Peer Reviewer Name	Name		e-mail	E-mail		
Scientific Committee Approval Date	501/06/202		Version Number	1.0		

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	COM-112	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	10. The principal objective of this course is to develop the analytic skills need to learn mathematics. 11. Studying basic mathematical concepts to solve problems. 12. To understand analyze systems in a mathematical manner. 13. This course deals with the basic concept of discrete mathematical. 14. This is the basic subject for most computer science subjects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 13. Recognize the basic concepts in a discrete mathematical structure. 14. To understand the fundamental properties of modeling computation. 15. Identify the finite state machines. 16. To study an optimistic approach principle. 17. Recognize the finite automata. 18. To studies properties deterministic finite state automata. 19. Recognize the propositions and truth values 20. To understand the logical connectives 21. To study tautologies and contradictions principle 22. To studies properties of logical equivalence 23. Recognize the algebra of propositions 24. Identify of the mathematical Induction 25. To studies methods of proofs by mathematical induction 26. To studies properties of matrices, types, and an operations on matrices
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>1. Modeling Computation</u> • Finite state machines • An Optimistic Approach • Finite automata • Deterministic Finite State Automata <u>2. Logic and Proofs</u> • <u>Propositions and Truth Values</u> • <u>Logical connectives</u> • <u>Tautologies and Contradictions</u> • <u>Logical Equivalence</u> • The Algebra of propositions • Mathematical Induction <u>3. Matrices</u>

	• <u>Types of Matrices</u> • <u>Operations on Matrices</u>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Discrete mathematics is foundational material for computer science: Many areas of computer science require the ability to work with concepts from discrete mathematics, specifically material from such areas as set theory, logic, graph theory, combinatorics, and probability theory. The main strategy that will be adopted in delivering the discrete mathematical structures module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. The module will include a combination of classes, and interactive tutorials.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	65	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4.3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	85	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered

Week 1	Introduction - Modeling Computation
Week 2	Finite state machines
Week 3	An Optimistic Approach
Week 4	Finite automata
Week 5	Deterministic Finite State Automata
Week 6	Logic and Proofs
Week 7	Mid-term Exam
Week 8	Propositions and Truth Values
Week 9	Tautologies and Contradictions
Week 10	Logical Equivalence
Week 11	The Algebra of propositions
Week 12	Mathematical Induction
Week 13	Matrices
Week 14	Types of Matrices
Week 15	Operations on Matrices
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Discrete mathematical structures for computer science by Bernard Kolman & Robert C. Busby	Yes
Recommended Texts	- Theory and problems of Discrete mathematics, by Seymour Lipschutz & Marc Lars Lipson, Schaum's Outline Series, third edition 2007. - Mathematical foundation of computer science, Y.N. Singh, 2005. - Discrete Mathematics and Its Applications, Seventh Edition, Kenneth H. Rosen, AT&T Laboratories, 2012.	Yes

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Integration Methods		Module Delivery		
Module Type	BASIC		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	COS-102				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		Undergraduate	Semester of Delivery		2
Administering Department		COM	College	COS	
Module Leader	Hassan Kadhom Ibrahim		e-mail	hassan.kadhom.ibrahim@uodiyala.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		04/06/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COS -101	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	15. Differentiate algebraic and trigonometric functions using key 16. Find the tangent line to a given graph at a given point
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this course, students will: 5. Use differentiation rules to differentiate algebraic and transcendental functions. 6. Identify appropriate calculus concepts and techniques to provide mathematical models of real-world situations and determine solutions to applied problems. 7. Evaluate definite integrals using the Fundamental Theorem of Calculus. 8. Demonstrate an understanding of the relationship between derivatives and integrals using the Fundamental Theorem of Calculus.
Indicative Contents المحتويات الإرشادية	- Applications of Differentiation Maximum and minimum, rates of change, differentials, linear approximations, increasing and decreasing functions, curve sketching. - Integration Integrals, techniques of integration, applications of integration. - Ordinary Differential Equations First order equations, second order linear equations with constant coefficients.

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	Develop an effective and time-efficient homework/study strategy for, not only your calculus class, but other classes as well. This will help you become a more confident, successful, and well-rounded student. It will lead to a healthier balance between work time and leisure time. Spend at least two to four hours on each homework assignment. This affords you extra time to work on challenging homework problems and helps you organize your thoughts, questions, and ideas. The more time you spend on homework, the more likely you are to articulate clear, concise questions to your classmates and teachers. The more time you spend on homework, the less time you will spend on frantic, last-minute preparation for exams. Definitions, formulas, and theorems that are introduced in class or needed to complete homework assignments should be memorized immediately. Postponing this until it's needed

	for the exam will impede your work speed on homework assignments and interfere with clearer and deeper understanding of calculus. Spend time working on calculus every day. Doing some calculus every day makes you more familiar with concepts, definitions, and theorems. This familiarity will make calculus get easier and easier one day at a time. Find at least one or two other students from your calculus class with whom you can regularly do homework and prepare for exams. Your classmates are perhaps the least used and arguably your best resource. An efficient and effective study group will streamline homework and study time, reduce the need for attendance at office hours, and greatly improve your written and spoken communication. The best time to use your classmates as study/homework partners is after you have made an honest effort on your own to solve the problems using your own wits, knowledge, and experience. When you encounter an unsolvable problem, don't give up too soon on it. Being stumped is an opportunity for mathematical growth and insight, even if you never solve the problem on your own. If you seek help prematurely, you will never know if you could have solved a tough problem without outside assistance. Begin preparing/outlining for exams at least five class days before the exam. Outlining the topics, definitions, theorems, equations, etc. that you need to know for the exam will help you focus on those areas where you are least prepared. Preparing early for the exam will build your self-confidence and reduce anxiety on the day of the exam. It's also an insurance policy against time lost to illness, unexpected family visits, and last-minute assignments in other classes. Generally speaking, pulling all-nighters and doing last-minute cramming for exams is a recipe for eventual academic disaster. Prepare for exams by working on new problems. Good sources for these problems are unassigned problems from your textbook, review exercises and practice exams at the end of each chapter, old hour exams, or old final exams. Studying exclusively from those problems which you have already been assigned and worked on may not be effective exam preparation. Problems for each topic are generally in the same section of the book, so knowing how to do a problem because you know what section of the book it is in could give you a false sense of security. Working on new randomly mixed problems more closely simulates an exam situation, and requires that you both categorize the problem and then solve it. Use all resources of assistance and information which are available to you. These include classnotes, homework solutions, office hours with your professor or teaching assistants, and problem sessions with your classmates. Do not rely exclusively on just one or two of these resources. Using all of them will help you develop a broader, more natural base of knowledge and understanding. Expect your exams to be challenging. If they are challenging, you will be prepared. If they are not challenging, you can expect to have an easy time getting a very high score!
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem)	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered	
Week 1	Differentiation: Introducing the Derivative. The Derivative as a Function. Rules of Differentiation	on
Week 2	Differentiation: The Product and Quotient Rules. Derivatives of Trigonometric Functions. Derivatives as Rates of Change.	tes
Week 3	Differentiation: The Chain Rule, Implicit Differentiation	on
Week 4	Differentiation: Derivatives of Inverse Trigonometric Functions. Related Rates.	es.
Week 5	Applications of Derivatives: Maxima and Minima. Mean Value Theorem. What Derivatives Tell Us	Us
Week 6	Applications of Derivatives: Graphing Functions. Optimization Problems	ms
Week 7	Applications of Derivative: Linear Approximation and Differentials. L'Hôpital's Rule	le
Week 8	Integration: Approximating Areas under Curves. Definite Integrals. Fundamental Theorem of Calculus.	us.
Week 9	Integration: Working with Integrals. Substitution Rule. Part 1	rt1
Week 10	Integration: Working with Integrals. Substitution Rule. Part 2	rt2
Week 11	Integration: Working with Integrals. Substitution Rule. Part 3	3
Week 12	Integration: Regions Between Curves. Volume by Slicing. Volume by Shells. Part 1	rt1
Week 13	Integration: Regions Between Curves. Volume by Slicing. Volume by Shells. Part 2	rt2
Week 14	Integration: Length of Curves, Surface Area, Logarithmic and Exponential Functions.	ns.
Week 15	Review	ew
Week 16	Preparatory week before the final Exam	am

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Edwards, C.H. and Penney, D.E. Elementary Differential Equations. Prentice-Hall. (latest ed.).	Yes
Recommended Texts	Thomas, G. and Finney, R. Calculus and Analytic Geometry. Addison-Wesley. (latest ed.). Adams, R. Single Variable Calculus. Pearson Education. (latest ed.).	Yes
Websites		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Programming Fundamentals</u>			Module Delivery
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	<u>COM-121</u>			
ECTS Credits	<u>8</u>			
SWL (hr/sem)	<u>200</u>			
Module Level	1			
Administering Department		com	College	2
Module Leader	Hassan Hadi Saleh		e-mail	Hassan.hadi@uodiyala.edu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2025		Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Introduction to Programming	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives	The educational objectives of this course are
أهداف المادة الدراسية	

	6- Demonstrate a thorough understanding of modular programming by designing programs that require the use of programmer-defined functions. 7- Demonstrate a thorough understanding of arrays by designing and implementing programs that search and sort arrays. 8- Demonstrate a thorough understanding of the object-oriented programming concepts of encapsulation, data abstraction and composition by designing and implementing classes including the use of overloaded functions and constructors. 9- Demonstrate a thorough understanding of the concept of pointers and dynamic memory allocation by designing and implementing programs using pointers and dynamic memory allocation. 10- Demonstrate a thorough understanding of the implementation of programmer-defined functions and classes by writing code, performing unit testing and debugging of multiple complex programs. 11- Demonstrate good documentation style in all of the programs written in this course. 12- Demonstrate proficiency in implementing data validation code, performing unit testing, and developing test plans while implementing robust solutions to the assignments in this course. 13- Demonstrate a thorough understanding of stream input/output for both console and files. 14- Demonstrate an understanding of the differences between C and C++ in the areas of strings, pass by reference/passing pointers, and structs by designing and implementing programs that use C strings, C++ strings, C language structs and classes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students will be exposed to the following concepts and/or skills at an introductory concepts level: 1- The analysis and design of programs based on requirements and performance considerations. 2- evaluation of various possible technical solutions. 3- object-oriented design consideration. 4- system integration. 5- program documentation. 6- program debugging procedures. 7- developing program testing plans. 8- consideration of program operating environment. 9- use of reusable software.
Indicative Contents المحتويات الإرشادية	Introduction to the C++ programming language and its subset, Program structure, blocks, storage types, console and file I/O, functions, arrays, strings, pointers, call-by-reference, call-by-value, and dynamic memory allocation. The concept and use of classes will be covered in some detail. Differences between C, C++. Some new features in C++ will be introduced.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- Lectures
- Tutorials
- Problem solving
- Lab
- Case study
- Small project

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered	
Week 1	Introduction to computers & programming.	
Weeks 2,3	Array: Array definition (Two-dimensional array). operations on Two- dimensional array (add, subtraction, multiplication and invers of array).	• •
Weeks 4,5,6	Functions	
Week 7	Mid-term Exam	
Weeks	Introduction to Classes & Objects	

8,9	
Weeks 10 and 11	Searching, Sorting, Algorithm Performance Analysis
Weeks 12 and 13	Pointers, dynamic memory allocation
Week 14	More about Classes and OOP
Week 15	Recursion
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Weeks 1 and 2	Array (Two-dimensional array). Operations on tow-dimensional array
Weeks 3 and 4	Decisions, Loops, Functions
Weeks 5,6 and 7	Classes
Weeks 8 and 9	Searching/Sorting
Weeks 10,11 and 12	Searching/Sorting
Weeks 13 and 14	Dynamic Arrays, Pointers
Week 15	Recursion

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Programming in C++ Frank Vahid and Roman Lysecky Available through the zyBooks website directly	Yes
	- A C++ compiler and/or IDE. There are many out there, but the only two that are officially supported: - CLion (on Windows and macOS) - Visual Studio (Windows only)	
	Think Like a Programmer, An Introduction to Creative Problem Solving V. Anton Spraul ISBN: 978-1593274245	
Recommended Texts		No

	A good text editor, such as: Notepad++ (This is my personal favorite) Sublime Text Atom, or Vim, or anything else you might prefer	
Websites	1-http://www.cplusplus.com/ 2-https://www.w3schools.com/cpp/	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	اللغة العربية		Module Delivery	
Module Type	نظري		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UD12			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	U	Semester of Delivery		
Administering Department		Type Dept. Code	College	Type College Code
Module Leader	Othman Khlan Farhan		e-mail	othaman@uodiyala.edu.iq
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification	
Module Tutor	Name(if available)		e-mail	E-mail

Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- تعريف الطلبة اهم المفاتيح الأساس في التعامل بلغة عربية فصيحة خالية من اي خطأ أو لحن وكافية التعلم فيما يخص الأدب والنحو والبلاغة والاملاء العربية وكل هذا لغير الاختصاص. 2- رفع القدرات التعبيرية للطلاب، وزيادة ثروتهم اللغوية ، ومساعدتهم على استخدام العبارة المناسبة بشكل دلالي واضح. 3- تدريب الطلبة على التحدث، والتنظيم المنطقي للأفكار، مع الحرص على التمسك باللغة العربية الفصحى . 4- رفع الأداء اللغوي العام لدى الطلبة. 5- تمكين الطلبة من الكتابة والتعبير والحديث بلغة عربية فصيحة وواضحة. 6- مساعدة الطلبة في التعبير عن افكارهم من خلال المناقشة والحوار بلغة سهلة وفصيحة . 7- جعل الطلبة قادرين على اكتساب خزين لغوي من الكلمات واللفاظ والتعبير الفصيحة. 8- تعلم الطلبة الحفاظ على لغة القرآن التراث العربي الاصيل.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	الأهداف المعرفية والمهارية: 1- يعرف اساليب اللغة العربية. 2- يوظف ادوات الترقيم عند الكتابة . 3- يتدرب على كيفية تحليل النصوص الادبية . 4- يعرب بعض الامثلة والتمارين عن الجملة الاسمية والفعلية . 5- يناقش بعض النصوص القرآنية والادبية . 6- يبين الفرق بين علامات الاعراب الاصلية والفرعية. 7- يميز بين الافعال والاسماء في الجمل. 8- يتدرب على القراءة الواضحة والإلقاء . 9- يتدرب على الكتابة بخط حسن من خلال التعريف بأنواع الخطوط العربية، وكتابة كل حرف، ثم كتاب الجمل والعبارات بخط الرقعة. 10- يميز بين حمزة القطع وهمزة الوصل عند الكتابة . 11- يميز بين حرفي الضاد والظاء في الكتابة والنطق. 12- يميز بين التاء المربوطة والمفتوحة اثناء الكتابة. 13- أحكام كتابة الضاد والظاء.
Indicative Contents	توزيع أهمية اللغة العربية وفوائدها بالنسبة للطلاب الجامعي (2 ساعة).

المحتويات الإرشادية	اللغة، تفسير وتحليل أول عشرة آيات من سورة الكهف مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية. (2 ساعة) اللغة، تفسير وتحليل ثلاثة آيات من سورة الحجرات مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية. (2 ساعة) الأدب، تحليل ثلاثة عشر سطرًا من قصيدة سفر أيوب في الشعر الحر للشاعر العراقي بدر شاكر السياب مع حياة الشاعر وأهم الأوجه البلاغية والنحوية في القصيدة. (2 ساعة) الأدب، تحليل ثمانية أبيات في الحماس للشاعر أبي الطيب المتنبي مع حياة الشاعر مع أهم الأوجه البلاغية والنحوية في القصيدة. (2 ساعة) قواعد اللغة العربية وأهميتها معرفة أقسام الكلام (الاسم والفعل والحرف) وأهم علاماتها. قواعد اللغة العربية :- النكرة والمعرفة، أنواع المعارف (العلم) شرح موضوع (اسم العلم والاسم المركب) مع الأمثلة. (2 ساعة) قواعد اللغة العربية، (الضمائر) شرح موضوع (الضمائر الرفع والنصب والجر) مع الأمثلة. (2 ساعة) اللغة، حفظ وتفسير وتحليل سورة الأعلى مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية. الأدب، تحليل ثمانية أبيات من قصيدة (كن بلسمًا) للشاعر (إيليا أبي ماضي) مع حياة الشاعر مع أهم الحالات الاعرابية والبلاغية. (2 ساعة) قواعد اللغة العربية، شرح موضوع (أسماء الإشارة) مع الأمثلة وحالات الاعراب، شرح موضوع (المعرف بالإضافة) مع الأمثلة وحالات الاعراب. (2 ساعة) قواعد اللغة العربية، شرح موضوع (الحال) معرفة الحال وصاحبها وما هي أنواع الحال مع الأمثلة وحالات الاعراب. (2 ساعة) الأدب في اللغة العربية، علامات الترقيم وأهميتها في اللغة العربية. (2 ساعة) قواعد اللغة العربية، شرح موضوع (العدد) معرفة تميز العدد وماهي أقسام العدد مع الأمثلة وحالات الاعراب.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- المحاضرة والمشاركة. - المناقشة والحوار. - العصف الذهني. - كتابة التقارير عن الموضوع. - السؤال والجواب.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	30	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	60		

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	توضيح أهمية اللغة العربية وفوائدها بالنسبة للطلاب الجامعي. اللغة، تفسير وتحليل أول عشرة آيات من سورة الكهف مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية.
Week 2	اللغة، تفسير وتحليل ثلاثة آيات من سورة الحجرات مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية.
Week 3	الادب، تحليل ثلاثة عشر سطرًا من قصيدة سفر أيوب في الشعر الحر للشاعر العراقي بدر شاكر السياب مع حياة الشاعر وأهم الأوجه البلاغية والنحوية في القصيدة.
Week 4	الادب، تحليل ثمانية أبيات في الحماس للشاعر أبي الطيب المتنبي مع حياة الشاعر مع أهم الأوجه البلاغية والنحوية في القصيدة.
Week 5	قواعد اللغة العربية وأهميتها معرفة أقسام الكلام (الاسم والفعل والحرف) وأهم علاماتها.
Week 6	قواعد اللغة العربية :- النكرة والمعرفة، أنواع المعارف (العلم) شرح موضوع (اسم العلم والاسم المركب) مع الأمثلة.
Week 7	قواعد اللغة العربية، (الضمائر) شرح موضوع (ضمائر الرفع والنصب والجر) مع الأمثلة.
Week 8	اللغة، تفسير وتحليل سورة الأعلى مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية.
Week 9	الادب، تحليل ثمانية أبيات من قصيدة (كن بلسما) للشاعر (إيليا أبي ماضي) مع حياة الشاعر مع أهم الحالات الاعرابية والبلاغية.
Week 10	قواعد اللغة العربية، شرح موضوع (أسماء الإشارة) مع الأمثلة وحالات الاعراب، شرح موضوع (المعرفة بالإضافة) مع الأمثلة وحالات الاعراب.
Week 11	قواعد اللغة العربية، شرح موضوع (الحال) معرفة الحال وصاحبها وما هي أنواع الحال مع الأمثلة وحالات الاعراب.
Week 12	الأمثلة في اللغة العربية، علامات الترتيب وأهميتها في اللغة العربية.
Week 13	قواعد اللغة العربية، شرح موضوع (العدد) معرفة تميز العدد وماهي أقسام العدد مع الأمثلة وحالات الاعراب.
Week 14	الأمثلة في اللغة العربية، احكام الهمزة (حمزة الوصل، حمزة القطع، كتابة الهمزة في وسط الكلمة).
Week 15	الأمثلة في اللغة العربية: احكام كتابة التاء المربوطة والمفتوحة والالف الممدودة والمقصورة.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	

Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. القرآن الكريم. 2. كتاب البلاغة والتطبيق. 3. كتاب الأملاء الواضح . 4. منهاج اللغة العربية لغير الاختصاص. 5. قواعد الإملاء الصحيحة لعبد السلام محمد هارون	Yes
Recommended Texts	1. كتاب شرح ابن عقيل على الفية ابن مالك/ ابن عقيل عبد الله بن عبد الرحمن. 2. كتاب الميسر في اللغة العربية لغير الاختصاص/ الدكتور زياد طارق شولي 3. منهاج اللغة العربية العامة لغير الاختصاص/ عبد القادر حسن امين 4. معاني النحو للدكتور فاضل السامرائي 5. إعراب القرآن وتفسيره وبيانه لمحمود الدرويش	Yes
Websites	1- مكتبة المصطفى http://www.al-mostafa.com/index.htm 2- مكتبة مشكاة الإسلام http://www.almeshkat.net/books/index.php 3- الجمعية العلمية للغة العربية http://www.imamu.edu.sa/arabiyah http://pdfbooks.net/vb/login.php	مكتبات الكتب المصورة

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

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

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>Human Rights and Democracy</u>		Module Delivery
Module Type	<u>Basic learning activities</u>		☒ Theory ☒ Lecture ☐ Lab ☐ L Tutorial ☐ Practical ☐ Seminar
Module Code	<u>UD14</u>		
ECTS Credits	<u>2</u>		
SWL (hr/sem)	<u>50</u>		
Module Level		Semester of Delivery	
Administering Department	جميع اقسام الكلية	College	College of Engineering
Module Leader		e-mail	
Module Leader's Acad. Title	لجنة حقوق الانسان والديمقراطية	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	512/06/202	Version Number	.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. يتعلم الطالب خلال السنة الدراسية أساسيات حقوق الانسان والديمقراطية ما حقوقه كيف يدافع عنها بالطرق القانونية وماهي ضماناتها الداخلية والدولية. 2. استحضار المعرفة في مجال الديمقراطية وأنواع أنظمتها واثرها على حقوق الانسان . 3. تنمية شخصية الطالب وتعزيز وعيهم في الأنظمة السياسية الديمقراطية وتفصيلها وكيفية تطبيقها على ارض الواقع واهمية ان يكون فعال في المجتمع من خلال احترامه لحقوق الآخرين ومعرفة ان الحقوق والحريات تنتهي عند بداية حقوقهم وحرياتهم ويؤدي واجباته بدلا من اكتساب الحقوق فقط. 4. تعزيز ثقافة السلام القائمة على العدل والمساواة.
Module Learning Outcomes	1. تمكين الطالب من معرفة اساسيات الدفاع عن حقوقه وحقوق الآخرين بعد معرفتها ومعرفة أهميتها له وللمجتمع بصورة عامة وأيضا معرفه كل شخص حدود حقوقه وحريته .

مخرجات التعلم للمادة الدراسية	2. تمكين الطالب في المشاركة السياسية وذلك من خلال معرفته بأهمية مشاركته في الانتخابات وتأثير هذه المشاركة على سير الانتخابات وتشكيل السلطة فيما بعد. 3. معرفة الطالب ضمانات حقوقه وحرياته وماهي مصادرها. 4. معرفة الفرق بين الحقوق والحريات. 5. تمكين الطالب من معرفة ماهي المفهوم العلمي للديمقراطية وماهي جذورها وانواعها واشكالها. 6. يتعلم الطالب كيف يؤثر النظام الديمقراطي على حقوق الانسان وماهي العلاقة بينها. 7. ادراك الطالب ضرورة ان يكون مواطن فعال في المجتمع ايضاً معرفه شروط الناخب وشروط المرشح للانتخابات. 8. معرفة أنظمة الانتخابات وايهما افضل. 9. فهم الطالب للقانون الدولي لحقوق الانسان وايضاً معرفة مختصرة عن المنظمات الدولية والية عملها كالأمم المتحدة ومنظمة الصليب الأحمر وغيرها.
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Indicative Contents المحتويات الإرشادية	الجزء الأول - تعريف حقوق الانسان وحقوق الانسان في الحضارات القديمة (تعريف الحق وتعريف الانسان ومعرفة أهمية حقوق الانسان بالنسبة للمجتمع أيضا دراسة حقوق الانسان في الحضارات كالحضارة المصرية والعراقية واليونانية والرومانية) (٤ ساعات) الجزء الثاني معرف حقوق الانسان في الأديان السماوية وأهمها الإسلام (٢ ساعة) مصادر حقوق الانسان تتضمن (مصادر دولية كالإعلان العالمي لحقوق الانسان والعهدان الدوليان والمصادر الإقليمية التي تشمل الاتفاقيات الإقليمية كالاتفاقية الأوروبية والأمريكية والدستور) (٢ ساعة) ضمانات حقوق الانسان (كالضمانات الدستورية والقانونية) (٢ ساعة) الآليات الدولية والإقليمية لحقوق الانسان (٢ ساعة) الحريات العامة وانواعها والمقارنة فيما بينها (٢ ساعة) مسبل حقوق الانسان والعولمة وحقوق الانسان (٢ ساعة) تعريف وتاريخ وأنواع الديمقراطية (دراسة تعريف ونشأة وتطور الديمقراطية مبادئها وانواعها كالديمقراطية المباشرة وغير المباشرة والنظام الرئاسي والبرلماني) (٦ ساعات) تعريف الانتخاب وشروطه وأنواع النظم الانتخابية وتعريف المجلس النيابي (٦ ساعات) العلاقة بين الديمقراطية وحقوق الانسان (٢ ساعة)
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. زيادة وعي الطالب بأهمية معرفه حقوقه وواجباته اتجاه المجتمع وعلاقة حقوق الانسان بالنظام الديمقراطي 2. ثقافة عامة في مجموعة من المجالات ومنها المجال القانوني و السياسي والاجتماعي ورفع ثقة الطالب بنفسه من خلال ربط المادة النظرية بالواقع العملي
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem)	33	Structured SWL (h/w)	2
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1.1
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem)	50		
الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	محاضرة تعريفية عن المادة وأهميتها ..
Week 2	تعريف الحق والانسان وحقوق الانسان وأهمية حقوق الانسان ،حقوق الانسان في الدين الإسلامي والحضارات القديمة.
Week 3	مصادر حقوق الانسان الدولية والإقليمية والمحلية.
Week 4	ضمانات حقوق الانسان الدستورية والقانونية وضمانات حقوق الانسان على الصعيد الدولي.
Week5	ضمانات حقوق الانسان في الإسلام
Week 6	دور المنظمات الإقليمية في حماية حقوق الانسان.
Week 7	خصائص حقوق الانسان وتعريف الحريات العامة وأنواعه والمقارنة بينها وبين الحقوق القانون الدولي لحقوق الانسان والقانون الدولي الإنساني ومنظمة الصليب الأحمر.
Week 8	مستقبل حقوق الانسان وسبل تطويرها .
Week 9	العولمة وحقوق الانسان .
Week 10	تعريف الديمقراطية وتطورها التاريخي ومبادئها . الديمقراطية بين العالمية والخصوصية . اشكال الديمقراطية / الديمقراطية المباشرة.
Week 11	الديمقراطية شبه المباشرة والديمقراطية التمثيلية / اركان النظام التمثيلي / اشكال النظام التمثيلي.
Week 12	المجلس النيابي وأنواعه / الانتخاب وشروطه / هيئة الناخبين.
Week 13	تنظيم عملية الانتخاب / تحديد الدوائر الانتخابية / القوائم الانتخابية / المرشحات / الحملة الانتخابية / التصويت .
Week 14	نظم الانتخابات.
Week 15	علاقة الديمقراطية بحقوق الانسان وكيفية التأثير والتأثر فيما بينها.
Week 16	الامتحان النهائي

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library
Required Texts	حقوق الانسان والطفل والديمقراطية / تأليف ماهر صالح علاوي ورياض عزيز هادي وعلي عبد الرزاق محمد واخرون / العاتك / بيروت / ٢٠٠٩	نعم
Recommended Texts	عباس الدليمي / حقوق الانسان الفكر والممارسة فخري رشيد، صلاح ياسين / المنظمات الدولية / العاتك لصناعة الكتاب / بغداد عصام العطية / القانون الدولي العام / المكتبة القانونية / بغداد / 2012	لا
Websites		

Grading Scheme

مخطط الدرجات

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

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

المرحلة الثانية

الكورس الأول

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>جرائم نظام البعث في العراق</u>			Module Delivery
Module Type	<u>Basic learning activities</u>			☒ Theory ☒ Lecture ☐ Lab ☐ L Tutorial ☐ Practical ☒ Seminar
Module Code	<u>UD24</u>			
ECTS Credits	<u>2</u>			
SWL (hr/sem)	<u>50</u>			
Module Level	2			
Administering Department	جميع اقسام الكلية	College	College of	
Module Leader				e-mail
Module Leader's Acad. Title				Module Leader's Qualification
Module Tutor				e-mail
Peer Reviewer Name				e-mail
Scientific Committee Approval Date	59/09/202			Version Number

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives	التعرف على ماهية الجريمة لغة واصطلاحاً وماهية أقسام الجرائم. التعرف على جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م. تنمية وعي الطالب بجرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا لسنة 2005م. دراسة الجرائم التي ارتكبها نظام البعث على مدى سنوات طويلة واثارها النفسية والاجتماعية . التعرف على صور انتهاكات حقوق الانسان وجرائم السلطة والتعرف على الجرائم البيئية لنظام البعث في العراق. 1. تعزيز الوعي بحقيقة ما جرى من مآسي المقابر الجماعية المرتكبة من النظام البعثي في العراق.
Module Learning Outcomes	1. تمكين الطالب من معرفة المفاهيم النظرية للجرائم وأركان الجرائم . 1. تمكين الطالب من معرفة أقسام الجرائم . 1. تمكين الطالب من معرفة قانون المحكمة الجنائية العراقية العليا لسنة 2005. 1. فهم تشكيل المحكمة الجنائية العراقية العليا لسنة 2005 والتعرف على تشكيل المحكمة إجراءات التقاضي امام المحكمة. 1. يتعلم الطالب أنواع الجرائم الدولية على وفق النظام الاساسي للمحكمة الجنائية الدولية. 1. معرفة الطالب بالاثار النفسية والاجتماعية لجرائم نظام البعث.

	1. يتمكن الطالب من فهم موقف النظام البعثي من الدين من خلال فهم عقيدة النظام السياسي سبيلاً لفهم موقف النظام من الدين. 1. يتمكن الطالب من التعرف على صور انتهاكات القوانين العراقية وانتهاكات حقوق الانسان وجرائم السلطة. 1. تمكن الطالب من التعرف على بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث. 10- يتعرف الطالب على أماكن السجون والاحتجاز لنظام البعث. 11- معرفة الطالب بالجرائم البيئية وبأثار الجرائم البيئية لنظام البعث، ويتعرف جرائم المقابر الجماعية.
Indicative Contents المحتويات الإرشادية	جزء الأول : جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا لعام 2005م، والجرائم النفسية والاجتماعية وأثارها وابرز انتهاكات النظام البعثي في العراق: تعريف بالجريمة لغة وأصطلاحاً، اركان واقسام الجريمة (2 ساعة). جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م : أنواع الجرائم الدولية، القرارات الصادرة من المحكمة الجنائية العليا (2 ساعة). وابرز القضايا التي نظرت فيها المحكمة (2 ساعة). الجرائم النفسية والاجتماعية وأثارها وابرز انتهاكات النظام البعثي في العراق: الجرائم النفسية، البات الجرائم النفسية (2 ساعة). اثار الجرائم النفسية، الجرائم الاجتماعية (2 ساعة). عسكرة المجتمع، موقف النظام البعثي من الدين (2 ساعة). انتهاكات قوانين العراقية، صور انتهاكات حقوق الانسان (2 ساعة). جرائم السلطة، بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث، أماكن السجون والاحتجاز لنظام البعث (2 ساعة). جزء الثاني : الجرائم البيئية لنظام البعث في العراق، جرائم المقابر الجماعية : جرائم البيئية لنظام البعث في العراق: التلوث الحربي والاشعاعي – استعمال الاسلحة المحرمة دولياً ومخاطر اللغام. (2 ساعة). التلوث بالمواد المشعة، أثار استخدام الاسلحة المحرمة دولياً (2 ساعة). تدمير المدن والقرى (سياسة الارض المحروقة): قصف المدن، قصف العتبات المقدسة والمساجد والحسينيات، معركة فخر جاسم ، حرق آبار النفط (2 ساعة). تجفيف الاهوار و اثارها البيئية والاجتماعية والاقتصادية (2 ساعة) ، تجريف بساتين النخيل والاشجار والمزروعات (2 ساعة). جرائم المقابر الجماعية وموقف الامم المتحدة منها (2 ساعة). احداث المقابر الجماعية المرتكبة من النظام البعثي في العراق، التصنيف الزمني لمقابر البادة الجماعية في العراق للمدة 1963 - 2003 (2 ساعة).
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- زيادة وعي الطالب بالجرائم التي ارتكبها نظام البعث في العراق وحقيقة ما جرى من مآسي وويلات بحق شعب العراقي. - اكتساب الطالب ثقافة عامة بماهية الجرائم واركانها واقسامها وموقف المشرع العراقي منها. - زيادة وعي الطالب بموقف القانون الدولي والمحاکم الجنائية الدولية من الجرائم والانتهاكات التي ترتكبها السلطة السلطوية.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعاً			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	1.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	محاضرة تعريفية عن المادة واهميتها.
Week 2	التعريف بالجريمة لغة واصطلاحاً، أقسام الجريمة، جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م ، أنواع الجرائم الدولية.
Week 3	القرارات الصادرة من المحكمة الجنائية العليا، وأبرز القضايا التي نظرت فيها المحكمة.
Week 4	الجرائم النفسية، اليات الجرائم النفسية.
Week5	الجرائم النفسية، الجرائم الاجتماعية
Week 6	عسكرة المجتمع، موقف النظام البعثي من الدين.
Week 7	انتهاكات القوانين العراقية، صور انتهاكات حقوق الانسان، جرائم السلطة.
Week 8	بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث، أماكن السجون والاحتجاز لنظام البعث.
Week 9	الجرائم البيئية لنظام البعث في العراق: التلوث الحربي والاشعاعي – استعمال الاسلحة المحرمة دولياً ومخاطر الالغام.
Week 10	التلوث بالمواد المشعة، أثار استخدام الاسلحة المحرمة دولياً
Week 11	تدمير المدن والقرى (سياسة الارض المحروقة).
Week 12	تجفيف الأهوار أثارها البيئية والاجتماعية والاقتصادية .
Week 13	تجريف بساتين النخيل والاشجار والمزروعات.
Week 14	جرائم المقابر الجماعية، أحداث المقابر الجماعية المرتكبة من النظام البعثي في العراق.
Week 15	التصنيف الزمني لمقابر الابادة الجماعية في العراق للمدة 1963 - 2003.
Week 16	الامتحان النهائي

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library
Required Texts		نعم

	المنهج المقرر الدراسي للجامعات الحكومية و الأهلية كافة كتاب وزارة التعليم والبحث العلمي ذي العدد (ت م 3 / 7588 في 2023/10/19)	
Recommended Texts		لا
Websites		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Computation Theory		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	COM-213			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	U			
Administering Department		com	College	3
Module Leader	Jumana Waleed Salih		e-mail	jumanawaleed@uodiyala.edu.iq
Module Leader's Acad. Title	Assistant Prof.		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	/2025804/0		Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-122	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This course emphasizes computability and computational complexity theory. Topics include regular and context-free languages, decidable and undecidable problems, reducibility, recursive function theory, time and space measures on computation, completeness, hierarchy theorems, inherently complex problems, oracles, probabilistic computation, and interactive proof systems.

	• Improve their mathematical thinking skill and habits, including thinking precisely about definitions, stating assumptions carefully, critically reading arguments, and being able to write convincingly. • Be able to understand both finite and infinite formal models of computation and to reason about what they can and cannot compute. • Understand both intuitively and formally what makes some problems either impossible or too expensive to solve with a computer, and what can be done in practice when an unsolvable or intractable problem is encountered. • Reason formally about the cost of computation, and be able to prove useful bounds on the costs of solving problems, including showing that certain problems cannot be solved efficiently. • Learn about some interesting aspects of theoretical computer science, and why understanding them matters even if you are only interested in building practical computing systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Acquisition of the basic concepts of probability and statistical inference. 2- Knowledge and understanding of basic statistical calculations and the software tools used for them. 3- The ability to identify the elements making up a univariate statistical model applied to real situations. 4- The ability to use standard statistical packages and to correctly interpret the lists produced.
Indicative Contents المحتويات الإرشادية	We explore these questions by developing abstract models of computing machines and reasoning about what they can and cannot compute efficiently. A main goal of this course is for you to understand how theoretical computer scientists reason about these questions, and connecting that theory to practical questions about computing. We will also look at some applications in cryptography that take advantage of problems being hard to solve, and what can be done when a problem cannot be solved or is too expensive to solve.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Automata and Language Theory (2 weeks) ◦ Finite automata, regular expressions, push-down automata, context-free grammars, pumping lemmas. • Computability Theory (3 weeks) ◦ Turing machines, the Church-Turing thesis, decidability, the halting problem, reducibility, the recursion theorem. • Complexity Theory (7 weeks) ◦ Time and space measures of complexity, complexity classes P, NP, L, NL, PSPACE, BPP and IP, complete problems, the P versus NP conjecture, quantifiers and games, hierarchy theorems,

	provably hard problems, relativized computation and oracles, probabilistic computation, interactive proof systems
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction, Finite Automata, Regular Expressions
Week 2	Nondeterminism, Closure Properties, Regular Expressions → Finite Automata
Week 3	The Regular Pumping Lemma, Finite Automata → Regular Expressions, CFGs
Week 4	Pushdown Automata, CFG ↔ PDA
Week 5	The CF Pumping Lemma, Turing Machines

Week 6	TM Variants, the
Week 7	Decision Problems for Au
Week 8	Midterm Exam
Week 9	P and NP, SAT,
Week 10	
Week 11	
Week 12	Space Complexity, SPAC
Week 13	P
Week 14	Games, C
Week 15	
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Sipser, Michael. <i>Introduction to the Theory of Computation</i> . 3 rd ed. Cengage Learning, 2012. ISBN: 9781133187790.	Yes
Recommended Texts	Introduction to Probability and Statistics 15th Edition by William Mendenhall (Author), Robert J. Beaver (Author), Barbara M. Beaver (Author)	no
Websites	https://www.coursera.org/courses?query=theory%20of%20computation	

Grading Scheme

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	<u>Introduction to Object Oriented Language</u>			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	COM-211				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		2	Semester of Delivery		
Administering Department		com	College	os	
Module Leader	Ismael Salih Aref		e-mail	asmaelsalih@uodiyala.edu.iq	
Module Leader's Acad. Title		.Lect	Module Leader's Qualification		MSc
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/08/2025	Version Number	.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Programming Language1	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The educational objectives of this course are 1- Understanding Core Concepts of OOP: Classes and Objects: Understanding the foundational building blocks of OOP, including how to define classes (blueprints) and create objects (instances of classes).

	• Encapsulation: Learning how to bundle data (attributes) and methods (functions) that operate on the data into a single unit or class, promoting data hiding and reducing complexity. • Inheritance: Grasping how new classes can be derived from existing ones, allowing for code reuse and the creation of hierarchical class structures. • Polymorphism: Understanding how different classes can be treated as instances of the same class through interfaces, allowing for flexibility in code through method overriding and overloading. • Abstraction: Learning to focus on essential qualities of an object while hiding unnecessary details, making complex systems easier to manage. 2- Developing Problem-Solving Skills: • Modeling Real-World Systems: Teaching students to represent real-world entities as objects, helping to develop systems that are intuitive and maintainable. • Design Patterns: Introducing common design patterns that solve recurring problems in OOP, fostering best practices in software development. • Code Reusability: Emphasizing the importance of creating reusable, modular code that can be easily extended and maintained. 3- Improving Software Design and Architecture: • Software Design Principles: Educating students on principles like SOLID (Single Responsibility, Open/Closed, Liskov Substitution, Interface Segregation, Dependency Inversion) to create well-structured and robust code. • Object-Oriented Analysis and Design (OOAD): Training students to analyze and design software systems using OOP principles, focusing on creating scalable and maintainable architectures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge and Understanding • MLO 1: Demonstrate a comprehensive understanding of the fundamental principles of Object-Oriented Programming, including concepts such as classes, objects, inheritance, polymorphism, encapsulation, and abstraction. • MLO 2: Understand and apply the principles of software design and architecture, including the use of design patterns and best practices in OOP. • MLO 3: Explain the benefits and limitations of the OOP paradigm in software development, including its impact on code reusability, maintainability, and scalability. 2. Cognitive/Intellectual Skills • MLO 4: Analyze real-world problems and design effective OOP solutions by modeling appropriate classes, objects, and relationships. • MLO 5: Critically evaluate and apply design patterns to solve common software design problems. • MLO 6: Assess the trade-offs between different object-oriented designs in terms of efficiency, complexity, and scalability. 3. Practical/Professional Skills: • MLO 7: Develop and implement object-oriented software using a relevant programming language (e.g., Java, C++, Python) that adheres to industry

	standards and best practices. • MLO 8: Apply techniques for debugging, testing, and maintaining object-oriented code, including the use of unit tests and version control systems. • MLO 9: Work collaboratively in a team environment to design and develop a substantial object-oriented software project, demonstrating effective communication and project management skills. 4. Key Transferable Skills: • MLO 10: Demonstrate problem-solving skills by breaking down complex problems into manageable components using OOP techniques. • MLO 11: Communicate technical information effectively, both verbally and in writing, through documentation, code comments, and presentations. • MLO 12: Adapt to new and emerging technologies in object-oriented programming, demonstrating lifelong learning and the ability to stay current with industry trends.
Indicative Contents المحتويات الإرشادية	The indicative content of an Object-Oriented Programming (OOP) course includes an introduction to core concepts like classes, objects, inheritance, encapsulation, polymorphism, and abstraction, along with advanced topics such as composition vs. inheritance, design patterns, and SOLID principles. It also covers object-oriented analysis and design (OOAD), practical implementation in a chosen programming language, and testing/debugging techniques. Students will work on hands-on projects, including collaborative team development, integrating OOP with databases, and exploring modern frameworks and libraries. The course concludes with discussions on contemporary OOP languages, emerging trends, and the future direction of software development.

Learning and Teaching Strategies			
استراتيجيات التعلم والتعليم			
Strategies	• Lectures • Tutorials • Problem solving • Lab • Case study • Small project		
Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	99	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6.6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	76	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to C++
Weeks 2	Classes and Objects: Explain Structure of Simple Class
Week 3	Access Specifiers: public, private and protected
Weeks 4	Encapsulation principle (data hiding)
Week 5	Constructor (usage and advantages)
Week 6	Destructor (Purpose, syntax, advantages)
Week 7	Mid-term Exam
Week 8	Inheritance Basics
Weeks 9	Types of Inheritance
Weeks 10	Function Overriding in class
Weeks 11	constructor overloading
Weeks 12	Polymorphism
Week 13	Virtual Functions
Week 14	Operator Overloading
Week 15	Homework Sheets solving
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Simple Class Structure
Week 2	Create Classes and objects

Week 3	Public and private example (control data access)
Week 4	Protected access specifier and private difference by examples.
Week 5	Structures of constructor
Week 6	Pointer and destructor roles
Week 7	Mid-term Exam
Week 8	Explain Inheritance structure by examples
Week 9	Many examples to explain inheritance levels and types.
Week 10	Apply Function Overriding in classes
Week 11	Apply constructor overloading with different arguments
Week 12	Explain Polymorphism concepts by examples.
Week 13	Examples to show usage of Virtual Functions
Week 14	Operator Overloading (unary and binary)
Week 15	Solving Examples Sheet
Week 16	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Programming in C++ Frank Vahid and Roman Lysecky Available through the zyBooks website directly	Yes
	- A C++ compiler and/or IDE. There are many out there, but the only two that are officially supported: - CLion (on Windows and macOS) - Visual Studio (Windows only)	
	Think Like a Programmer, An Introduction to Creative Problem Solving V. Anton Spraul ISBN: 978-1593274245	
	- A good text editor, such as: - Notepad++ (This is my personal favorite) - Sublime Text - Atom, or Vim, or anything else you might prefer	
Recommended Texts		No
Websites	1- http://www.cplusplus.com/ 2- https://www.youtube.com/@IsmaelSalh	

Grading Scheme

مخطط الدرجات

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

	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

2026/2027

Module Information				
معلومات المادة الدراسية				
Module Title	Data Structure		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	COM-212			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	Undergraduate	Semester of Delivery		
Administering Department	Computer Science	College	Science	
Module Leader	Ali Abdulrahman Mahmood		e-mail	alialani@uodiyala.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.	
Module Tutor		e-mail	E-mail	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	01/8//2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-121	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. The objective required of the student in order to successfully pass the course requirement is to understand how - through - data is represented and stored - inside the calculator. The student's realization of the types of algorithms used in data representation. 2.2 3. Developing the student's ability to use the software available in this field, in addition to the skills he acquires in data processing and how they are represented inside the calculator. 4. Developing the student's ability to write software that handles data and how to represent it in a calculator.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 17. Display an Introduction to Data structures. 18. List the Strategies for choosing the right data structure. 19. Explain the first Linear data structures- Array. 20. Explain the Pointer and its operations, applications. 21. Describe the Structure. 22. Define the Linked list and its operations, applications. 23. Identify the second Linear Data Structure: The Stack 24. Discuss the third Linear Data Structure: The Queue 25. Explain the The Graph 26. Explain the The Tree. 27. Identify the Heaps and its operations 28. Describe the searching, sorting
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Basics Algorithm Specifications: Performance Analysis and Measurement (Time and space analysis of algorithms- Average, best and worst case analysis) Introduction To Data Structure: • Data Management concepts, • Data types – primitive and non-primitive, • Types of Data Structures- Linear & Non Linear Data Structures. Linear Data Structure • Array: Representation of arrays, Applications of arrays, sparse matrix and its representation., • Stack: Stack-Definitions & Concepts, Operations On Stacks, Applications of Stacks, Polish Expression, Reverse Polish Expression And Their Compilation, Recursion, Tower of Hanoi, • Queue: Representation Of Queue, Operations On Queue, Circular Queue, Priority Queue, Array representation of Priority Queue, Double Ended Queue, Applications of Queue, • Linked List: Singly Linked List, Doubly Linked list, Circular linked list ,Linked implementation of Stack, Linked implementation of Queue, Applications of linked list. Nonlinear Data Structure : • Tree-Definitions and Concepts, Representation of binary tree, Binary tree traversal (Inorder, postorder, preorder), • Threaded binary tree, • Binary search trees, • Conversion of General Trees To Binary Trees,

	• Applications Of Trees- Some balanced tree mechanism, eg. AVL trees, 2-3 trees, Height Balanced, Weight Balance , • Graph-Matrix Representation Of Graphs, Elementary Graph operations,(Breadth First Search, Depth First Search, Spanning Trees, Shortest path, Minimal spanning tree). SORTING And SEARCHING • Insertion Sort, • Quick Sort, • Merge Sort, • Heap Sort, • Sorting On Several Keys, • List and Table Sort,
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• At the start of course, the course delivery pattern, prerequisite of the subject will be discussed. • Lectures will be conducted with the aid of multi-media projector, black board, OHP etc. • Attendance is compulsory in lecture which carries 10 marks in overall evaluation. • One internal exam will be conducted as a part of internal theory evaluation. • Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation. • Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation. • The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. • Experiments shall be performed in the laboratory related to course contents.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome	
Formative assessment	Quizzes	2	10% (10)	4 and 8	LO #1, #2 and #3	#3
	Assignments	2	10% (10)	6 and 14	LO #3, #4 and #6	#7
	Projects / Lab.	1	10% (10)	Continuous		All

	Report	1	10% (10)	15	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Data structures.
Week 2	the Strategies for choosing the right data structure.
Week 3	the Linear data structures- Array /one dimensional array
Week 4	An array/ two dimensional array
Week 5	the Pointer and its operations, applications
Week 6	the Structure.
Week 7	Mid- term Exam
Week 8	the Linked list, linked list types and its operations, applications
Week 9	the second Linear Data Structure: The Stack
Week 10	the third Linear Data Structure: The Queue
Week 11	The Graph
Week 12	The Tree, binary tree
Week 13	the Heaps and its operations
Week 14	Sorting
Week 15	Searching , Searching types
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to C++ Programming Language.
Week 2	1D array operations
Week 3	2D array operations
Week 4	structures & pointers in C
Week 5	Write a program for linked list insertion, deletion & copy
Week 6	Stack operations Write a program to perform PUSH, POP, PEEK & CHANGE operations on Stack using array.
Week 7	Stack operations Write a program to perform PUSH, POP, PEEK & CHANGE operations on Stack using linked list.
Week 8	Midterm Exam
Week 9	Queue Operations Write a program to implement insertion & deletion in a queue using array.

Week 10	Queue Operations Write a program to implement insertion & deletion in a queue using linked list.
Week 11	Circular Queue Operations Write a program to implement insertion & deletion in a circular queue.
Week 12	Sorting and searching: Write a program to perform • Selection sort
Week 13	Sorting and searching: Write a program to perform • Merge sort
Week 14	Sorting and searching: Write a program to perform • Quick sort
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Tanenbaum Aaron M, Langsam Yedidyah, Augenstein J Moshe, Data Structures using C. 2-Tremblay J.P and Sorenson P.G, An introduction to data structures with applications, Tata McGraw Hill, 2nd Edition	Yes
Recommended Texts	1-Fundamentals of Computer Algorithms by Horowitz, Sahni, Galgotia Pub. 2001 ed. 4. 2-Fundamentals of Data Structures in C++-By Sartaj Sahani. 3- Data Structures: A Pseudo-code approach with C -By Gilberg & Forouzan Publisher-Thomson Learning	yes
Websites	Data Structures by Lipschutz Seymour [Schaum's Outline]	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Numerical Methods			Module Delivery
Module Type	Basic			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☒ Seminar
Module Code	SCI-103			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	11C	Semester of Delivery	3	
Administering Department	com	College	science	
Module Leader	Iraq ali hussein		e-mail	iraqali@uodiyala.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	24/08/2025		Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Computational mathematics	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The main objectives of the course are to: • Provide an understanding of numerical methods for solving mathematical problems. • Develop skills in implementing numerical algorithms. • Introduce the application of numerical methods to real-world engineering problems.

	- Focus on error analysis and computational stability of algorithms. - Teach students how to develop and analyze their own numerical algorithms.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After completion of the course students are expected to be able to: - Understand the fundamental principles of numerical methods. - Analyze the accuracy and stability of numerical solutions. - Implement numerical algorithms in a programming environment. - Apply numerical methods to solve practical engineering and scientific problems. - Critically evaluate the performance of different numerical methods.
Indicative Contents المحتويات الإرشادية	- Introduction to Numerical Methods and Error Analysis. - Solutions of Nonlinear Equations. - Numerical Differentiation and Integration. - Numerical Solutions of Ordinary Differential Equations. - Numerical Linear Algebra. - Interpolation and Curve Fitting. - Optimization Techniques. - Stability and Convergence of Algorithms.

Learning and Teaching Strategies			
استراتيجيات التعلم والتعليم			
Strategies	• Lectures, Lab Tutorials, Practical Exercises, and Assignments		
Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	66	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Numerical Methods * Definitions and classifications * Importance and applications * Overview of error analysis
Week 2	Solutions of Nonlinear Equations * Bisection method * Newton-Raphson method * Secant method
Week 3	Numerical Differentiation and Integration * Trapezoidal rule * Simpson's rule * Numerical differentiation formulas
Week 4	Numerical Solutions of ODEs * Euler's method * Runge-Kutta methods * Stability of ODE solutions
Week 5	Numerical Linear Algebra * Gaussian elimination * LU decomposition * Iterative methods
Week 6	Interpolation * Lagrange interpolation * Newton's divided difference * Spline interpolation
Week 7	Midterm Exam
Week 8	Optimization Techniques * Unconstrained optimization * Constrained optimization * Application in engineering
Week 9	Stability and Convergence * Analysis of numerical algorithms * Convergence criteria * Practical examples
Week 10	Case Studies and Applications * Application of numerical methods in engineering * Discussion of case studies
Week 11	Introduction to Numerical Methods * Definitions and classifications * Importance and applications * Overview of error analysis
Week 12	Solutions of Nonlinear Equations * Bisection method * Newton-Raphson method * Secant method
Week 13	Numerical Differentiation and Integration * Trapezoidal rule * Simpson's rule * Numerical differentiation formulas
Week 14	Numerical Solutions of ODEs * Euler's method * Runge-Kutta methods * Stability of ODE solutions
Week 15	Numerical Linear Algebra * Gaussian elimination * LU decomposition * Iterative methods

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Weeks 1 and 2,3	Introduction to Numerical Software * Overview of software tools used for numerical analysis * Setting up the environment * Basic operations
Weeks 4 and 5,6	Nonlinear Equations * Implementing bisection method * Implementing Newton-Raphson method * Comparison of methods
Weeks 7,8 and 9	Numerical Integration * Implementing trapezoidal and Simpson's rule * Numerical differentiation * Error analysis
Weeks 9 and 10 ,11	Ordinary Differential Equations * Implementing Euler's method * Implementing Runge-Kutta methods * Solving real-world problems
Weeks 12,14 and 14	Linear Algebra * Implementing Gaussian elimination * LU decomposition * Solving systems of linear equations

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	- Burden, R. L., & Faires, J. D. (2011). Numerical Analysis (9th Edition). Cengage Learning. - Chapra, S. C., & Canale, R. P. (2015). Numerical Methods for Engineers (7th Edition).	
Recommended Texts	- Sauer, T. (2012). Numerical Analysis. Pearson. - Atkinson, K. E. (1989). An Introduction to Numerical Analysis (2nd Edition). Wiley.	
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Web Design and Programming</u>		Module Delivery	
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>COM-214</u>			
ECTS Credits	<u>6</u>			
SWL (hr/sem)	<u>150</u>			
Module Level	UO	Semester of Delivery		3
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Dheyab Salman Ibrahim		e-mail	dr.dheyab@uodiyala.edu.iq
Module Leader's Acad. Title	Assistant Prof		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	1-6-2025		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	29. The aim of this module is to describe structures, procedures, protocols and principles of Web Development. 30. This course aims at designing web pages using HTML, CSS and Java Script. 31. To teach the fundamentals of HTML and the Web. 32. To teach the Internet and the World Wide Web. 33. Give a broad overview of Web Technologies. 34. Give practical exposure and theoretical understanding of the tools, technologies and techniques used to design and create a website. 35. Also learn about creating lists, getting feedback with forms, creating tables and frames. 36. The module also covers the basics of programming using HTML, CSS. 37. Finally, you will be introduced to JavaScript, dealing with Java Script variables and data types, Statement and Operators and Control structures, object based programming message box in JavaScript. 38. This course hoped that the knowledge would help you become proficient in HTML, fully versed in the language's syntax, semantics and elements of style.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 27. To understand the fundamental types of websites. 28. To understand the basic versions of websites. 29. Develop an understanding of the technology and protocols underlying the World Wide Web and construct responsive websites using HTML, CSS, and JavaScript. 30. Demonstrate the principles of Web usability, and design strategies including considerations of the user experience. 31. Illustrate the importance of website validation and develop code that is reliable and responsive across a range of browsers. 32. Recognize and understand the legal and ethical constraints on web development. 33. Recognize the basic concepts of the Internet. 34. To understand the fundamental properties of websites. 35. To learn several basic web design technologies. 36. To learn basic tags in HTML. 37. To learn basic styles in CSS. 38. To learn how to add css styles to HTML. 39. To learn JavaScript language. 40. Define the Internet 41. Differentiate between the Internet and the World Wild Web 42. Describe the History of the Internet 43. List World Wide Web browser software available in this course material 44. Explain the meaning of WWW 45. Describe how WWW works 46. Explain parts of URLs 47. Define HTML 48. Describe the History of HTML 49. Explain how HTML works 50. Describe how to open a Notepad 51. Describe markup tag in HTML 52. Write a simple HTML Document using text editor

	53. Describe the head and body section of HTML 54. Create a headline for your document using head section 55. Describe the paragraph marker. 56. Define hypertext link 57. List types and uses of hypertext link 58. Define unordered lists, ordered list, definition list and list within list 59. Distinguish between Ordered list and list within list 60. Explain HTML form 61. List types of input field in HTML form 62. Explain JavaScript language 63. List types of Operators in JavaScript 64. List types of Control Structures	
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Assignment 1 will incorporate the design elements: Assignment 2 will look toward the development side of the website: Formative assessment will be carried out through laboratory exercises, making use of relevant tasks and scenarios. 1. Computer networks and data communication • Define a data communication system. • List the components of data communication system. • Define a computer networks. • List the types of a computer networks. 2. Internet Overview • Define the Internet • Internet History • Define WWW • HTTP, URL, Website, IP, DNS, Web Browser 3. Web Overview • Define a web. • History of web • Types of web • Web versions 4. HTML • Introduction to HTML • Basic HTML Document • HTML tags • Basic Text Formatting 5. CSS • Web document construction • CSS Benefits • Types of Selectors • CSS – Inclusion 6. JavaScript • JavaScript – Overview • JavaScript – Syntax • JavaScript – Variables • JavaScript – Operators	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

Web design is foundational material for computer science: Many areas of computer science require the ability to work with concepts from web design technologies, specifically material from such HTML, CSS, and JavaScript.

The main strategy that will be adopted in delivering the Web design structures module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. The module will include:

- Lectures
- Lab
- Small project

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Data Communication and Networking
Week 2	Internet Overview
Weeks 3	Web Overview
Weeks 4	Introduction to HTML
Week 5	HTML Tags
Week 6	HTML Links - Hyperlinks
Weeks 7	HTML Lists
Weeks 8	Midterm Exam 1
Weeks 9	HTML Tables
Weeks 10	HTML Forms
Weeks 11	HTML Frames
Weeks 12	Introduction to CSS
Weeks 13	Introduction to JavaScript
Weeks 14	Midterm Exam 2
Weeks 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	HTML Tags
Week 2	HTML Links - Hyperlinks
Week 3	HTML Lists
Week 4	HTML Tables
Week 5	HTML Forms
Week 6	HTML Frames
Week 7	CSS

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- How the Internet Works, Preston Gralla, Pearson Education, Eighth Edition. - Internet for Everyone, Alexis Leon, S. Chand (G/L) & Company Ltd; Second Edition.	Yes

Recommended Texts	- -DATA COMMUNICATIONS AND NETWORKING, Fourth Edition, Behrouz A. Forouzan - “Web Programming Step by Step” by Marty Stepp, Jessica Miller, Victoria Kirst. -A useful web site for learning more about web development - Available here: https://www.geeksforgeeks.org/web-1-0-web-2-0-and-web-3-0-with-their-difference/ - (1970) https://websitebuilders.com/how-to/glossary/web2/ - Available here: https://askanydifference.com/difference-between-web-1-0-and-web-2-0-with-table/	Yes
Websites	http://www.w3schools.com Tutorial points Simply easy learning	

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

المرحلة الثانية

الكورس الثاني

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Computer Architecture</u>		Module Delivery	
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☒ Seminar	
Module Code	<u>COM-223</u>			
ECTS Credits	<u>4</u>			
SWL (hr/sem)	<u>100</u>			
Module Level	11C	Semester of Delivery		
Administering Department	com	College	os	
Module Leader	Khalid Mohammed Saffer		e-mail	dr.khaledmoh@uodiyala.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	1/02/2027		Version Number	2

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Logic Design COM-123	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	In a Computer Architecture module, the objectives typically revolve around understanding the structure, operation, and design of computer systems. Here are some common objectives you might encounter: 1. Understanding Fundamental Concepts. 2. Exploring Processor Design. 3. Memory Hierarchy and Management. 4. Understanding Data Paths and Control. 5. Performance Analysis. 6. Exploring Parallelism. 7. Input/Output Systems. 8. Pipelining and Hazards. 9. Exploring Emerging Trends. 10. Practical Applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Learning outcomes for a Computer Architecture module define what students should be able to do upon successful completion of the course. Here are some typical learning outcomes: 1. Understand and Describe Core Concepts. 2. Analyze and Design Processor Architectures. 3. Evaluate and Optimize System Performance. 4. Understand Memory Organization and Hierarchy. 5. Demonstrate Knowledge of Parallelism. 6. Implement and Simulate Basic Computer Systems. 7. Identify and Address Pipelining Issues. 8. Understand Input/Output Mechanisms. 9. Apply Knowledge to Emerging Technologies. 10. Collaborate and Communicate Effectively.
Indicative Contents المحتويات الإرشادية	Introduction to computer architecture, basic organization of computer, basic operational concepts, bus structures, requirements of I/O system, I/O interfacing techniques, memory system organization, 8085 Microprocessor, Intel core family.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• lecture • Tutorial • Conducting discussion panels within the lecture • Giving weekly homework • Asking questions during the lecture
Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا	

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3.4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to computer architecture
Week 2	Basic organization of computer
Week 3	Basic operational concept
Week 4	Bus structures
Week 5	Requirements of I/O system
Week 6	I/O interfacing techniques
Week 7	Memory system organization
Week 8	Midterm exam
Week 9	Memory hierarchy
Week 10	Memory structure and its requirements
Week 11	Associative memory
Week 12	Cache memory
Week 13	8085 Microprocessor
Week 14	Pipelining
Week 15	Gantt's chart

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Weeks 1 and 2	
Weeks 3 and 4	
Weeks 5,6 and 7	
Weeks 8 and 9	
Weeks 10,11 and 12	
Weeks 13 and 14	
Week 15	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Mano, M. Morris, Computer System Architecture, 3rd Edition, Prentice-Hall, Inc., 1993.	
Recommended Texts	- Mostafa Abd-El-Barr, Hesham El-Rewini, "Fundamentals of Computer Organization and Architecture", A John Wiley & Sons, Inc Publication, 2005. - M. Morris Mano, Computer Engineering Hardware Design, 1st Edition, Prentice-Hall, Inc., 1988.	
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	<u>Computer Graphics</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>COM-222</u>				
ECTS Credits	<u>6</u>				
SWL (hr/sem)	<u>150</u>				
Module Level	U				
Administering Department		Type Dept. Code	College	Semester of Delivery	
Layla Abd AL-Hak Esmaeel				4	
Module Leader	Layla Abd AL-Hak Esmaeel		e-mail	laylaaeabdalhaq@uodiyala.edu.iq	
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification		Msc.
Module Tutor			e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2025		Version Number	.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1- The main objective of this module is to introduce to the students the concepts of computer graphics. 2- Defining the important steps in designing geometric shapes 3- Studying the methods of mathematical representation of geometric shapes and geometrical transformations. 4-Preparing qualified graduates to work in the field of computerized applications by representing data in the form of computer graphics. 5- Introducing the student to the field of computer graphics and processing visual and engineering information using computer technologies. 6- focuses on the mathematical and computational foundations of image generation and processing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1- Identify the basic elements of graphics and their applications. 2- understand of the structure of an interactive computer graphics system. 3- List the various terms associated with graphics mode . 4- studying all the various of algorithms associated with Drawing lines. 5- studying all the various of algorithms associated with Drawing circle. 6- Have a knowledge and understanding of geometrical transformations and 2D viewing. 7- Have a knowledge and understanding of techniques for representing 2D geometrical objects. 8- Have a knowledge and understanding of geometrical transformations and 3D viewing. 9- Have a knowledge and understanding of techniques for representing 3D geometrical objects. 10- Have a knowledge and understanding of interaction techniques. 11- Explain all(functions) related with drawing (pixel,line,circle..). 12- Be able to create interactive graphics applications. 13- Perform simple 2D graphics with lines, curves and can implement algorithms to rasterizing simple shapes, fill and clip polygons. 14- studying all the various of algorithms associated with clipping. 15- Explain the windowing and viewing. 16- Identify the applications of windowing and viewing.
Indicative Contents المحتويات الإرشادية	This course introduces computer Graphics . This course has been approved to satisfy the Comprehensive Articulation Agreement for transferability as a pre-major . Home Works and Assignments Attendance is mandatory. Every class is important. All deadlines are hard. Under normal circumstances late work will not be accepted. Students are required to take all the tests. No make-up tests will be given under normal circumstances. Any form of cheating on exams/assignments/quizzes is subject to serious penalty Attendance 75% attendance is mandatory. Latecomers will be marked as absent. Evaluation Criteria Assignments/projects 20% Quizzes 10% Mid-Term 20% Final 5 %

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Computer graphics
Week 2	Basics of (Elementary Figures Plotting Points)
Week 3	Line Drawing Horizontal and Vertical Lines, DDA algorithm
Week 4	Arbitrary Lines, Bresenham's Line Algorithm

Week 5	Functions to draw line, some drawing related with line
Week 6	Circle Drawing
Week 7	Functions to draw circle, some drawing related with circle
Week 8	Bresenham's Circle Algorithm
Week 9	Introduction- Geometric Transformations(Translate,Rotate,Reflection,scaling)
Week 10	Two-Dimensional Transformations
Week 11	Clipping and Windowing
Week 12	Windowing and viewing
Week 13	Introduction -Three-Dimensional (3-D)
Week 14	(3-D) Three Dimensional Transformations(Translate,Rotate,Reflection,scaling)
Week 15	Projections, Parallel Orthographic Projection
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Matlab
Week 2	Lab 2: application to algorithm (Line)
Week 3	Lab 3: application to algorithm (circle)
Week 4	Lab 4: application to algorithm (Two-Dimensional (2-D))
Week 5	Lab 5: application to algorithm (Three-Dimensional (3-D))
Week 6	Lab 6: application to algorithm (clipping and windowing and viewing)
Week 7	Lab 7: application to algorithm (Projections)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Principles of Interactive Computer Graphics", William M. Newman and Robert F. Sprooull, McGraw-Hill International Book Company, 1984. "Computer Graphics with Pascal", Marc Berger, the Benjamin / Cummings Publishing Company, 1986. "Computer Graphics", Zhigang Xiang and Roy A. Plastock, Schaum's outline Series, McGraw-Hill Company, 1992. "Computer Graphics C Version", Donald Hearn and M. Pauline Baker, Prentice-Hall Company, 1997.	Yes

Recommended Texts	1-“FUNDAMENTALS OF COMPUTER GRAPHICS USING MATLAB LANGUAGE”, Amaal Kadum Dawood&Juleet Kadim Daood&Jinan Redha Mutar,2022	Yes
Websites	http://www.edm2.com/0507/introcpp1.htm	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Introduction to Python		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☒ Seminar	
Module Code	COM-224			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	11C	Semester of Delivery		
Administering Department	com	College	os	
Module Leader	Ali Hussein Fadil		e-mail	Ali.hussien@uobasrah.edu.iq
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor	Name (if available)		e-mail	E-mail

Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	20/08/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Introduction to Object Oriented Language	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Python Programming is intended for software engineers, systems analysts, program managers and user support personnel who wish to learn the Python programming language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The learning objectives of this course are: ▪ To understand why Python is a useful scripting language for developers. ▪ To learn how to design and program Python applications. ▪ To learn how to use lists, tuples, and dictionaries in Python programs. ▪ To learn how to identify Python object types. ▪ To learn how to use indexing and slicing to access data in Python programs. ▪ To define the structure and components of a Python program. ▪ To learn how to write loops and decision statements in Python. ▪ To learn how to write functions and pass arguments in Python. ▪ To learn how to build and package Python modules for reusability. ▪ To learn how to read and write files in Python. ▪ To learn how to design object-oriented programs with Python classes. ▪ To learn how to use class inheritance in Python for reusability. ▪ To learn how to use exception handling in Python applications for error handling.
Indicative Contents المحتويات الإرشادية	Introduction to Programming in Python: Introduction to Programming in Python: What Is Python? Features of Python, Python environment set up. [5 hrs.] Download & Install Python: Download your operating system-compatible Python Interpreter, install Python, customize Python shell, and write & execute Python programs using Interactive mode and script mode. Python PyCharm or IDE sets Python for PyCharm IDE, configures PyCharm IDE, and writes & executes Python programs. [5 hrs.]

	Structure of a Python Program Basics of Programming in Python: Input statement, output statement, variables, operators, numbers, Literals, strings, lists and tuples, dictionaries. [16 hrs.] Conditionals, Loops, and Functions. Conditionals and Loops: if statement, else Statement, elif Statement, while Statement, for Statement break Statement, continue Statement, pass Statement. Functions: Built-in Functions, User-defined functions: Defining a Function, Calling a Function, Various Function Arguments. [25 hrs.] Files, Modules, and Introduction to Advanced Python. Files: File Objects, File Built-in Methods, File Built-in Attributes, Standard Files, Command-line Arguments Modules: Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, Module Built-in Functions, Packages. [20 hrs.]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Python programming and installation, why using Python, python connected environment type Python PyCharm or IDE, set Python for PyCharm IDE, libraries, Python code (print), experiment with example code.
Week 2	Data Types: Int, float, Boolean, string, and list; variables, expressions, statements, precedence of operators, comments.
Week 3	modules, functions--- function and its use, flow of execution, parameters, and arguments. data type, variable types, and experiment function, string type.
Week 4	CONTROL FLOW, LOOPS Conditionals: Boolean values and operators, conditional (if), alternative (if-else).
Week 5	CONTROL FLOW, chained conditional (if-elif-else).
Week 6	LOOPS Conditionals: Iteration: while, for, break, continue.
Week 7	Mid Exam
Week 8	FUNCTIONS, ARRAYS Fruitful functions: return values, parameters, local and global scope, and function composition.
Week 9	Recursion.
Week 10	Strings: string slices, immutability, string functions and methods, string module
Week 11	Python arrays, Access the Elements of an Array, array methods.
Week 12	LISTS, TUPLES, DICTIONARIES Lists: list operations, list slices, list methods, list loop
Week 13	Mutability, aliasing, cloning lists, list parameters, list comprehension;
Week 14	Tuples: tuple assignment, tuple as return value, tuple comprehension; Dictionaries: operations and methods, comprehension
Week 15	FILES, EXCEPTIONS: Files and exceptions: text files, reading and writing files.

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Python programming and installation Python environment, PyCharm.
Week 2	Example of first Python code (print) code, string type.
Week 3	An example of Python data type and variables is a library of PyCharm
Week 4	Starting of Python project.
Week 5	Example of Python mathematic operations, List, and operation
Week 6	Example of Python List.
Week 7	More examples of list function
Week 8	Apply of python project 1.
Week 9	Example of Python Tuples
Week 10	Example of Python Tuples
Week 11	Example of Python function
Week 12	Apply of python project 2.
Week 13	Example of Conditional statements (if-else).
Week 14	Example of Loops (for, while, do-while).
Week 15	First Dissection of Python Project.

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Think Python: How to Think Like a Computer Scientist”, Allen B. Downey 2nd edition, Updated for Python 3, Shroff/O ‘Reilly Publishers, 2016.	
Recommended Texts	“Core Python Programming”, W.Chun, Pearson, Kenneth A. Lambert, Cengage, Learning Python, Mark Lutz, Orielly.	
Websites	https://www.gcreddy.com/2021/05/python-programming-syllabus.html .	

Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria

Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>OOP Programming Fundamentals</u>			Module Delivery
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	<u>COM-211</u>			
ECTS Credits	<u>5</u>			
SWL (hr/sem)	<u>125</u>			
Module Level	1			
Administering Department		com	College	4
Module Leader	Ismael Salih Aref		e-mail	asmaelsalih@uodiyala.edu.iq
Module Leader's Acad. Title	Assist.Lect		Module Leader's Qualification	MSc
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/07/2025		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

The educational objectives of this course are

4- Understanding Core Concepts of OOP:

- **Classes and Objects:** Understanding the foundational building blocks of OOP, including how to define classes (blueprints) and create objects (instances of classes).
- **Encapsulation:** Learning how to bundle data (attributes) and methods (functions) that operate on the data into a single unit or class, promoting data hiding and reducing complexity.
- **Inheritance:** Grasping how new classes can be derived from existing ones, allowing for code reuse and the creation of hierarchical class structures.
- **Polymorphism:** Understanding how different classes can be treated as instances of the same class through interfaces, allowing for flexibility in code through method overriding and overloading.
- **Abstraction:** Learning to focus on essential qualities of an object while hiding unnecessary details, making complex systems easier to manage.

5- Developing Problem-Solving Skills:

- **Modeling Real-World Systems:** Teaching students to represent real-world entities as objects, helping to develop systems that are intuitive and maintainable.
- **Design Patterns:** Introducing common design patterns that solve recurring problems in OOP, fostering best practices in software development.
- **Code Reusability:** Emphasizing the importance of creating reusable, modular code that can be easily extended and maintained.

6- Improving Software Design and Architecture:

- **Software Design Principles:** Educating students on principles like SOLID (Single Responsibility, Open/Closed, Liskov Substitution, Interface Segregation, Dependency Inversion) to create well-structured and robust code.
- **Object-Oriented Analysis and Design (OOAD):** Training students to analyze and design software systems using OOP principles, focusing on creating scalable and maintainable architectures.

7- Enhancing Team Collaboration and Code Maintenance:

- **Version Control Integration:** Learning to use version control systems (e.g., Git) in the context of OOP projects to manage code changes collaboratively.
- **Code Documentation and Comments:** Understanding the importance of documenting code, especially in large, object-oriented projects, to facilitate collaboration and maintenance.
- **Testing and Debugging:** Gaining skills in writing unit tests for classes and objects, and learning debugging techniques specific to object-oriented codebases.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge and Understanding • MLO 1: Demonstrate a comprehensive understanding of the fundamental principles of Object-Oriented Programming, including concepts such as classes, objects, inheritance, polymorphism, encapsulation, and abstraction. • MLO 2: Understand and apply the principles of software design and architecture, including the use of design patterns and best practices in OOP. • MLO 3: Explain the benefits and limitations of the OOP paradigm in software development, including its impact on code reusability, maintainability, and scalability. 2. Cognitive/Intellectual Skills • MLO 4: Analyze real-world problems and design effective OOP solutions by modeling appropriate classes, objects, and relationships. • MLO 5: Critically evaluate and apply design patterns to solve common software design problems. • MLO 6: Assess the trade-offs between different object-oriented designs in terms of efficiency, complexity, and scalability. 3. Practical/Professional Skills: • MLO 7: Develop and implement object-oriented software using a relevant programming language (e.g., Java, C++, Python) that adheres to industry standards and best practices. • MLO 8: Apply techniques for debugging, testing, and maintaining object-oriented code, including the use of unit tests and version control systems. • MLO 9: Work collaboratively in a team environment to design and develop a substantial object-oriented software project, demonstrating effective communication and project management skills. 4. Key Transferable Skills: • MLO 10: Demonstrate problem-solving skills by breaking down complex problems into manageable components using OOP techniques. • MLO 11: Communicate technical information effectively, both verbally and in writing, through documentation, code comments, and presentations. • MLO 12: Adapt to new and emerging technologies in object-oriented programming, demonstrating lifelong learning and the ability to stay current with industry trends.
Indicative Contents المحتويات الإرشادية	The indicative content of an Object-Oriented Programming (OOP) course includes an introduction to core concepts like classes, objects, inheritance, encapsulation, polymorphism, and abstraction, along with advanced topics such as composition vs. inheritance, design patterns, and SOLID principles. It also covers object-oriented analysis and design (OOAD), practical implementation in a chosen programming language, and testing/debugging techniques. Students will work on hands-on projects, including collaborative team development, integrating OOP with databases, and exploring modern frameworks and libraries. The course concludes with discussions on contemporary OOP languages, emerging trends, and the future direction of software development.

Learning and Teaching Strategies			
استراتيجيات التعلم والتعليم			
Strategies	• Lectures • Tutorials • Problem solving • Lab • Case study • Small project		
Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to inheritance
Weeks 2,3	Type of inheritance
Weeks 4,5,6	Constructor inheritance , friend function , virtual function
Week 7	Mid-term Exam
Weeks	UML Diagrams

8,9	
Weeks 10 and 11	SOLID Principles
Weeks 12 and 13	Interfaces and abstract classes , Abstract Methods
Week 14	polymorphism
Week 15	template
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Weeks 1 and 2	Apply inheritance
Weeks 3 and 4	Methods and data member inheritance
Weeks 5,6 and 7	Constructor inheritance
Weeks 8 and 9	friend function, virtual function
Weeks 10,11 and 12	Interfaces and abstract classes , Abstract Methods
Weeks 13 and 14	Polymorphism examples.
Week 15	Template examples.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Programming in C++ Frank Vahid and Roman Lysecky Available through the zyBooks website directly	Yes
	- A C++ compiler and/or IDE. There are many out there, but the only two that are officially supported: - CLion (on Windows and macOS) - Visual Studio (Windows only)	
	Think Like a Programmer, An Introduction to Creative Problem Solving V. Anton Spraul ISBN: 978-1593274245	
Recommended Texts		No

	A good text editor, such as: Notepad++ (This is my personal favorite) Sublime Text Atom, or Vim, or anything else you might prefer	
Websites	1-http://www.cplusplus.com/ 2-https://www.w3schools.com/cpp/	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Visual Programming		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	COM-225			
ECTS Credits	4.00			
SWL (hr/sem)	100			
Module Level		2		Semester of Delivery
Administering Department			College	Type College Code
Module Leader	Muntadher Khamees mustafa		e-mail	alkarawis@uodiyala.edu.iq
Module Leader's Acad. Title		Assist. Prof.	Module Leader's Qualification	
Module Tutor	Name (if available)		e-mail	E-mail

Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2026	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-211	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. This course will provide a managerial perspective of information systems and what role they play in an organization. Student learn about the modern technologies and how organizations can use these technologies for their growth.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	CLO-1: Knowledge (C1) * Use the different elements of a visual programming language as building blocks to develop correct, coherent programs. CLO-2: Application (C3) * Program using the fundamental software development process, including design, coding, documentation, testing, and debugging. CLO-3: Analysis (C4) * Analyze problems, develop conceptual designs that solve those problems, and transform those designs to Visual Programs with VB.Net.
Indicative Contents المحتويات الإرشادية	This course introduces computer programming using the Visual Programming language with object-oriented programming principles. Emphasis is on event-driven programming methods, including creating and manipulating objects, classes, and using object-oriented tools such as the class debugger. Upon completion, students should be able to design, code, test and debug at a beginning level. This course has been approved to satisfy the Comprehensive Articulation Agreement for transferability as a pre-major and/or elective course requirement.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	S.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا	
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Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week 1	Introduction to Scratch: Overview of the interface, sprites, blocks, and creating a basic project.
Week 2	Understanding Events: Event-driven programming and triggering actions using events.
Week 3	Loops and Iteration: Repeat blocks, forever loops, and nested loops.
Week 4	Conditional Statements: If-then and if-then-else blocks for decision-making.
Week 5	Variables: Creating and using variables to store and manipulate data.
Week 6	Working with Operators: Mathematical and logical operators for dynamic behavior.
Week 7	Creating Animations: Using costumes, backdrops, and timing for animations.
Week 8	Building Simple Games: Basics of game development, scoring, and timers.
Week 9	MIDTERM EXAM
Week 10	User Interaction: Sensing blocks for keyboard and mouse inputs.
Week 11	Broadcasting and Messaging: Communication between sprites using broadcast messages.
Week 12	Project Development: Designing and implementing a complete project (e.g., game or animation).
Week 13	Debugging and Optimization: Identifying and fixing errors in Scratch projects.
Week 14	Advanced Topics: Custom blocks (functions) and cloning.
Week 15	Final Project Preparation: Developing a comprehensive Scratch project.
Week 16	FINAL EXAM

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Lab 1: Introduction to the Scratch interface and basic project creation.
Week 1	Lab 2: Event-driven programming with Scratch.
Week 2	Lab 3: Loops and iterations in Scratch projects.
Week 3	Lab 4: Using conditional statements in interactive projects.
Week 4	Lab 5: Creating and manipulating variables in Scratch.
Week 5	Lab 6: Adding animations with costumes and backdrops.
Week 6	Lab 7: Building a simple game with scoring and timers.
Week 7	Lab 8: Debugging and optimizing Scratch projects.
Week 8	Lab8: Implement the TRY-THROW-CATCH structure for exception handling

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Mitchel Resnick, "Scratch Programming for Beginners: An Introduction to Creative Coding", Scratch Foundation. 650154-0.	Yes
Recommended Texts	- Derek Breen, "Scratch for Kids For Dummies", 2015, ISBN: 978-1119014874	No
Websites		

Grading Scheme

مخطط الدرجات

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

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

المرحلة الثالثة

الكورس الأول

فرع الحاسوب

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
Module Title	Artificial Intelligence		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	COM-312			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		6
Administering Department	Computer Science	College	College of Science	
Module Leader	Prof. Dr. Hassan Hadi Saleh	e-mail	Hassan.hadi@uodiyala.edu.iq	
Module Leader's Acad. Title	Professor	Module Leader's Qualification		Ph.D.
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	1-6-2025	Version Number	.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Programming fundamentals, data structures, elementary linear algebra, probability and differentiation. Official prerequisite module codes are set by the department.	Semester	
Co-requisites module	None proposed. Python revision is embedded in the opening laboratory.	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This module develops the ability to model intelligent behaviour, solve problems through search, and build and evaluate introductory machine learning and neural network models. Weekly laboratories connect the theory to reproducible Python experiments. 1. Explain the principal approaches to artificial intelligence and the role of rational agent in designing intelligent systems. 2. Develop formal problem representations and select search methods using solution quality and computational requirements. 3. Connect machine learning concepts to the construction and evaluation of simple predictive models. 4. Establish the foundations needed to understand neural network training and convolutional architectures. 5. Develop practical programming, experimental reasoning and technical communication through documented laboratory work. Module Learning Outcomes On successful completion, the student will be able to achieve the following observable outcomes. The same LO identifiers are used in the weekly plans and assessment table.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On successful completion, the student will be able to achieve the following observable outcomes. The same LO identifiers are used in the weekly plans and assessment table.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• Lectures • Tutorials • Problem solving
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- Lab
- Case study
- Small project

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome	
Formative assessment	Quizzes	2 × 30 min	10% (10)	Weeks 5, 11	LO #1, #2 and #10,	#11
	Assignments	2 assignments	10% (10)	Weeks 6, 10	LO #3, #4 and #6	#7
	Projects / Lab.	Portfolio, practical test and project demonstration	10% (10)	Weeks 1–15; test and demo in 15		All
	Report	1 project report and an individual seminar contribution	10% (10)	Week 15	LO #5, #8 and	#10
Summative assessment	Midterm Exam	2hr	10% (10)		LO #1	#7
	Final Exam	2hr	50% (50)			All
Total assessment			100% (100 Marks)			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered	
Week 1	AI foundations and scope Definitions of intelligence and AI; the four classical approaches; a short historical timeline; capabilities and limits; the relationship between AI, ML and DL. Use a small set of application examples to distinguish perception, reasoning and learning.	
Week 2	Rational agents and environments Percepts, actions, agent function and architecture; rationality and performance measures; PEAS specification; observability, uncertainty, dynamics and multiple agents; reflex, model-based, goal-based, utility-based and learning agents.	
Weeks 3	Problem formulation and state-space search	

	Initial state, actions, transition model, goal test and path cost; state versus search node; frontier and explored set; tree versus graph search. Formulate route planning, the vacuum world and the 8-puzzle. Introduce completeness, optimality, time and memory. Learning check: Write one formal problem definition and identify repeated states in its search graph.
Weeks 3	Uninformed search BFS, DFS and uniform-cost search; depth-limited and iterative-deepening search; queue, stack and priority-queue behaviour; cycle handling. Compare algorithm properties under clearly stated assumptions about finite branching, edge costs and state repetition.
Week 4	Informed search and heuristics Heuristic functions; greedy best-first search and A*; the roles of path cost and estimated remaining cost; admissibility and consistency; handling better paths to an existing state. Relate optimality to the selected graph-search implementation.
Week 5	AI foundations and scope Definitions of intelligence and AI; the four classical approaches; a short historical timeline; capabilities and limits; the relationship between AI, ML and DL. Use a small set of application examples to distinguish perception, reasoning and learning.
Weeks 6	Local search and optimisation State-space landscapes; objective functions; hill climbing, local optima and plateaus; random restarts; simulated annealing and temperature. Use N-Queens to distinguish finding a good configuration from finding a minimum-cost path. Learning check: Compare success rate and objective value across repeated runs. Submit Assignment 1.
Weeks 7	Adversarial search and games
Weeks 8	Machine learning foundations and midterm One hour of new theory: learning from experience; task, performance and experience; features and labels; supervised, unsupervised and reinforcement learning; regression versus classification. The 2-hour midterm covers Weeks 1–7. Use the tutorial and seminar for dataset examples and project framing.
Weeks 9	Supervised learning and model evaluation A simple decision-tree classifier and linear-regression baseline; training, validation and test roles; fitting preprocessing only on training data; confusion matrices, accuracy, precision, recall, F1 and mean absolute error. Introduce overfitting and model selection.
Weeks 10	Neural network foundations Artificial neurons, weights and bias; perceptron limitations; activation functions; multilayer perceptrons; forward propagation; output choices for regression and classification; loss functions and the distinction between a parameter and a hyperparameter.
Weeks 11	Training neural networks and generalisation Gradient descent, learning rate, batches and epochs; backpropagation as application of the chain rule; training versus inference; learning curves; underfitting and overfitting; weight penalties, dropout and early stopping.
Weeks 12	Convolutional neural network operations Images as tensors; local receptive fields and shared weights; filters, channels and feature maps; stride and padding; nonlinear activation; max pooling; flattening and dense layers. Calculate output dimensions and parameters for a small network.
Weeks 13	CNN training and interpretation Prepare image data; define and train a small CNN; inspect learning curves and classification errors; compare against an MLP baseline on the same split. Use feature maps and selected saliency examples to discuss what visualisation can and cannot explain.
Weeks 14	Selected CNN architectures Compare LeNet, AlexNet, VGG, Inception and residual connections through their design principles. Analyse depth, parameter counts and computational demand. Use selected worked examples rather than reproducing the entire architecture slide bank.
Week 15	Integrated AI applications and review

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Python environment and reproducible notebooks
Week 2	A simple rational agent
Week 3	State-space representation
Week 4	BFS DFS and uniform-cost search
Week 5	Greedy search and A*
Week 6	Local search on N-Queens
Week 7	Minimax and alpha-beta pruning
Week 8	Learning tasks and dataset preparation
Week 9	Supervised baseline and evaluation
Week 10	Neurons and forward propagation
Week 11	Training an MLP
Week 12	Convolution pooling and tensor shapes
Week 13	Training and evaluating a CNN
Week 14	Architecture comparison and project consolidation
Week 15	Individual practical assessment and project demonstration

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, 4th edition. Selected sections on agents, search, machine learning and deep learning. Chapter numbering differs between US and Global editions.	Yes
Recommended Texts	Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016. Chapters 6–9 for feedforward networks, regularisation, optimisation and CNNs.	No
Websites	https://aima.cs.berkeley.edu/	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria

Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Language Translator</u>			Module Delivery
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>COM-311</u>			
ECTS Credits	<u>4</u>			
SWL (hr/sem)	<u>100</u>			
Module Level	UO			
Administering Department		Type Dept. Code	College	Type College Code
Module Leader	Layla Abd AL-Hak Esmael		e-mail	laylaaeabdalhaq@uodiyala.edu.iq
Module Leader's Acad. Title		M.sc.	Module Leader's Qualification	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name		Name	e-mail	E-mail
Scientific Committee Approval Date		01/06/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-213	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This module presents the theory and practice of compilers. The first part of the module gives an overview of a compiler and its structure. A compiler for Mini Java is gradually developed in Java, using the parser generator ANTLR. As each new feature is added to the compiler, the relevant parts of the compiler are modified. The second part of the module covers some relevant topics from computation theory and algorithms in greater detail: finite state automata for lexical analysis; parsing algorithms for syntax analysis; This part also introduces several common optimizations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<i>Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</i> 1. Know and Learn what the general structures in which the compiler works 2. Use a parser generator to create a parser for a programming language; 3. It's possible to use symbol table and specify tokens, lexemes, and patterns; 4. Describe and explain the purpose of each stage in a typical compiler; 5. Compute whether a finite state automaton recognizes an input word; 6. Convert descriptions of regular languages between natural language, regular expressions and finite state automata; 7. Draw a parse tree or left-most derivation for a sentence, given a grammar; 8. Describe how a parsing algorithm works and trace its execution for a simple example; 9. Demonstrate that a given grammar is ambiguous; 10. Rewrite an ambiguous grammar to enforce the correct precedence or associativity; 11. Can parsing the string based on one of types of a parser; 12. Suggest what type checks are necessary for a programming language construct or fragment of code; 13. Write intermediate code corresponding to high-level language code; 14. Describe common programming language optimizations and apply them to high-level language code or intermediate code; 15. Can distinguish between types of conflicts in the program code; 16. Analyses code in programming language as intermediate code generation and implementation.
Indicative Contents المحتويات الإرشادية	This module will cover the theoretical knowledge and practical skills required to understand and construct conventional compilers for bespoke programming languages. The module will cover 4 main topics in language compiler and development. 1) Language Specification - Syntax and semantics, language grammar, derivation sequences. 2) Compiler Architecture - components, phases and general structures of compilers, including FSM approach and phase interactions 3) Analysis - Lexical, Syntax and semantic analysis as a compiler phase. Recursive descent compilation. Error detection. 4) Code / Artefact Generation - generation of target platform code or artefact.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering the Language Translator module is to engage students actively in practical exercises to enhance their understanding and develop their critical thinking skills.

	The module will include a combination of classes, interactive tutorials, and hands-on experiments focused on activities that capture students' interest. Through interactive classes, students will be introduced to the theoretical foundations of Language Translator, including key concepts, techniques, and algorithms. The classes will provide a solid understanding of topics Language Translator such as phases of compiler, kinds of language and interpret it, types of parser, types of conflicts and types of errors and so on. To enhance learning and encourage active participation, interactive lessons will be conducted. These tutorials will include practical exercises where students will work on applying all the methods used in the compiler and all algorithms of the parser as programs in one of the developed programming languages. This hands-on approach will help students understand the practical implications of theoretical concepts discussed in the classroom. Overall, the unit delivery approach aims to actively engage students, improve their critical thinking skills, and provide them with hands-on experiences in image processing and a language interpreter. By combining theoretical knowledge with practical activities, students will develop a deeper understanding of language compiler concepts and their applications in various fields.
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	204
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered semester 1:

Week 1	Introduction
Week 2	Programming Languages
Week 3	The Analysis - Synthesis model of compilation- Phases of a Compiler
Week 4	Symbol Table-component of symbol table-types of symbol table
Week 5	Compiler structure
Week 6	lexical analysis
Week 7	Abstract Syntax Tree
Week 8	Preliminary scanning
Week 9	Tokens, Patterns, Lexemes
Week 10	Attributes for tokens ,Lexical errors, Input buffer
Week 11	A simple approach to the design of lexical analysis
Week 12	Regular Definitions
Week 13	Finite Automata (FA) -DFA -NFA
Week 14	
Week 15	
Week 16	Syntax Analysis -Top Down -Bottom Up

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Write a LEX Program to scan reserved word & Identifiers of C Language.
Week 2	Implement Predictive Parsing algorithm
Week 3	Write a C program to generate three address code
Week 4	Implement SLR(1) Parsing algorithm
Week 5	Design LALR bottom up parser for the given language
Week 6	Write a C program for implementing the functionalities of predictive parser for the mini language specified in Not 1.
Week 7	*Write a C program for constructing of LL (1) parsing (b) *Write a C program for constructing recursive descent parsing.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Compiler principles and tools	Yes
Recommended Texts	Basics of Compiler Design	No
Websites	https://mindmajix.com/compiler-design-interview-questions	

Grading Scheme

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information						
معلومات المادة الدراسية						
Module Title	<u>Cryptography</u>		Module Delivery			
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar			
Module Code	<u>COM-313</u>					
ECTS Credits	<u>6</u>					
SWL (hr/sem)	<u>150</u>					
Module Level			Semester of Delivery	5		
Administering Department		com	College	os		
Module Leader	Ghassan Sabeeh Mahmood		e-mail	ghassan@uodiyala.edu.iq		
Module Leader's Acad. Title		Assistant Prof.	Module Leader's Qualification			
Module Tutor		Name (if available)	e-mail	E-mail		
Peer Reviewer Name		Name	e-mail	E-mail		

Scientific Committee Approval Date	01/06/2025	Version Number	1.0
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Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This course will provide a managerial perspective of Cryptography and what role they play in an organization. Students learn about the modern technologies and how organizations can use these technologies for their growth.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course provides the students with a deep understanding of how modern cryptographic schemes work. We introduce the necessary mathematical concepts in a way that is accessible for every student. This course focused on practical relevance by introducing most crypto algorithms that are used in modern real-world applications. For every crypto scheme, up-to-date security estimations and key length recommendations are given. We also discuss the important issue of software and hardware implementation for every algorithm. In addition to crypto algorithms, we introduce topics such as important cryptographic protocols, modes of operation, security services and key establishment techniques.
Indicative Contents المحتويات الإرشادية	This course introduces Cryptography technique. This course has been approved to satisfy the Comprehensive Articulation Agreement for transferability as a pre-major and/or elective course requirement. Home Works and Assignments Attendance is mandatory. Every class is important. All deadlines are hard. Under normal circumstances late work will not be accepted. Students are required to take all the tests. No make-up tests will be given under normal circumstances. Any form of cheating on exams/assignments/quizzes is subject to serious penalty Attendance 75% attendance is mandatory. Latecomers will be marked as absent. Evaluation Criteria Assignments/projects 20% Quizzes 10% Mid-Term 20% Final 50%

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	S.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Cryptography
Week 2	Stream Ciphers
Week 3	The Data Encryption Standard (DES) and Alternatives
Week 4	The Advanced Encryption Standard (AES)
Week 5	More About Block Ciphers
Week 6	Introduction to Public-Key Cryptography
Week 7	The RSA Cryptosystem
Week 8	MID TERMS
Week 9	Public-Key Cryptosystems Based on the Discrete Logarithm Problem
Week 10	Elliptic Curve Cryptosystems
Week 11	Digital Signatures
Week 12	Hash Functions
Week 13	Message Authentication Codes (MACs)
Week 14	Key Establishment
Week 15	Preparing for final exams
Week 16	FINAL EXAMS

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Stream Ciphers
Week 2	The Data Encryption Standard (DES) and Alternatives
Week 3	The Advanced Encryption Standard (AES)
Week 4	The RSA Cryptosystem
Week 5	Public-Key Cryptosystems Based on the Discrete Logarithm Problem
Week 6	Digital Signatures
Week 7	Hash Functions
Week 8	Message Authentication Codes (MACs), Key Establishment

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Paar, Christof, and Jan Pelzl. <i>Understanding cryptography: a textbook for students and practitioners</i> . Springer Science & Business Media, 2009.	Yes
Recommended Texts	Stallings, William. "Cryptography and Network Security principles and practice sixth edition." (2006).	No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 – 100	Outstanding Performance
	B - Very Good	جيد جدا	80 – 89	Above average with some errors
	C - Good	جيد	70 – 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Introduction to Database		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	COM-315			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	3	Semester of Delivery		
Administering Department	com	College	os	
Module Leader	Zainab Mohammed Ali		e-mail	zainab_m@uodiyala.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2025		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This course will enable students to Provide a strong foundation in database concepts, technology, and practice. Practice SQL programming through a variety of database problems. Demonstrate the use of concurrency and transactions in database Design and build database applications for real world problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The students should be able to: Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS. Use Structured Query Language (SQL) for database manipulation. Design and build simple database systems Design and build GUI application to interact with databases.
Indicative Contents المحتويات الإرشادية	This subject serves as an introduction to data modelling and databases from a technical and data management perspective. The subject will include Entity Relationship modelling (from conceptual design to physical modelling), normalization, de-normalization, relational model and relational algebra, SQL, query processing and query optimization, transactions, storage organization, database administration, data warehousing and big data analytics. Other topics in data management and DBMS technology with an overview of modern MySQL systems may also be included.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

S.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	22	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Database & Database Management system.
Week 2	Database System Concepts and Architecture
Week 3	Data Models, Schemas, and Instances
Week 4	The Three-Schema Architecture
Week 5	Data Independence
Week 6	Centralized and Client/Server Architectures for DBMSs
Week 7	Centralized DBMSs Architecture
Week 8	Basic Client/Server Architectures
Week 9	Two-Tier Client/Server Architectures for DBMSs
Week 10	Three-Tier and n-Tier Architectures for Web Applications
Week 11	Entity Relationship Models (ERMs)
Week 12	Database Design Process
Week 13	Basic ER Modelling
Week 14	Basic Relationship
Week 15	Mapping Constraints
Week 16	FINAL EXAM

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
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Week 1	Introduction to SQL
Week 2	Create Table Construct
Week 3	The select Clause
Week 4	The where Clause
Week 5	Set Operations
Week 6	Subqueries in the From Clause
Week 7	Modification of the Database
Week 8	project

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	FUNDAMENTALS OF Database Systems, SIXTH EDITION, Ramez Elmasri & Shamkant B. Navathe	NO
Recommended Texts	Database system concepts', 6th Edition – Abraham Silberschatz, Henry Korth, S, Sudarshan, (McGraw Hill International)	No
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Digital Image Processing			Module Delivery
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	COM-314			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		
Administering Department	com	College		
Module Leader	Abdulbasit Kadhim Shukur		e-mail	dr.abdulbasit@uodiyala.edu.iq
Module Leader's Acad. Title	Ast.Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2025		Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-222	Semester	4
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	9. To develop Image processing skills and understanding of circuit theory through the application of techniques. 10. To understand analog Image, digital image and mathematical model of one- and two-dimensional signal (image).

	11. This course deals with the basic concept of image equalization, sampling and quantization. 12. To understand image enhancement, image degradation and image compression. 13. To understand mathematical and logical concepts of image. 14. To understand convolution and filtering in image processing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 39. Recognize how the image equalization process works. 40. Image sampling and quantization. 41. Summarize what is meant by spatial and frequency domain. 42. Discuss image enhancement and image restoration process. 43. Describe lineal interpolation, bilinear interpolation. 44. Define the adjacency in image processing. 45. Identify the basic arithmetic operation in image. 46. Identify the basic logic operation in image. 47. Discuss zero order hold and first order hold in image analysis 48. Discuss the operations of convolution in image processing. 49. Discuss the concepts of filters in image processing. 50. Edge detection filters and smoothing filters. 51. Image histogram 52. Image histogram equalization 53. Image compression 54. Lose and lose less methods in image compression
Indicative Contents المحتويات الإرشادية	6. Introduction to Digital Image Processing: • Overview of image processing and its applications. • Fundamental concepts and components of digital image processing system. • Image representation and visualization. 7. Image Enhancement: • Point processing techniques, such as histogram equalization and contrast stretching. • Spatial domain methods, including spatial filtering and image sharpening. • Frequency domain methods, such as Fourier transform and filtering in the frequency domain. 8. Image Restoration: • Noise models and noise removal techniques. • Image deblurring and restoration algorithms. • Image reconstruction from projections. 9. Color Image Processing: • Color models and color spaces. • Color transformation and manipulation. • Color image enhancement and restoration. 10. Image Compression: • Image compression techniques, including lossless and lossy compression. • Transform coding and predictive coding. • Image compression standards, such as JPEG and JPEG2000. 11. Morphological Image Processing: • Morphological operations, such as erosion, dilation, opening, and closing. • Structuring elements and their role in morphological operations. • Morphological image analysis and feature extraction. 12. Image Segmentation: • Image segmentation techniques, including thresholding, region-based segmentation, and edge detection. • Clustering algorithms for image segmentation. • Watershed segmentation and its applications. 13. Image Representation and Description:

	• Image representation using boundary and region descriptors. • Texture analysis and texture descriptors. • Object recognition and image classification. 14. Image Filtering and Restoration: • Image filtering techniques, including linear and nonlinear filters. • Adaptive and spatially variant filters. • Restoration techniques for removing blur, noise, and other distortions. 15. Image Analysis and Computer Vision: • Image analysis techniques, including object detection, tracking, and motion estimation. • Pattern recognition and machine learning in image processing. • Applications of image processing in computer vision.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering the image processing module is to engage students actively in practical exercises to enhance their understanding and develop their critical thinking skills. The module will include a combination of classes, interactive tutorials, and hands-on experiments focused on sampling activities that capture students' interest. Through interactive classes, students will be introduced to the theoretical foundations of image processing, including key concepts, techniques, and algorithms. The classes will provide a solid understanding of topics such as image enhancement, image restoration, image segmentation, and image analysis. To reinforce learning and encourage active participation, interactive tutorials will be conducted. These tutorials will involve hands-on exercises where students will work with real-world images and apply different image processing techniques. This practical approach will help students grasp the practical implications of the theoretical concepts discussed in the classes. In addition to tutorials, simple experiments will be introduced to provide students with opportunities to explore various sampling activities. These experiments will focus on real-life scenarios and problems related to image processing. Students will be encouraged to think critically, analyze the results, and propose solutions based on their understanding of the concepts learned. The module will also emphasize the importance of collaboration and teamwork. Students will be encouraged to work together on projects and assignments, fostering a collaborative learning environment where they can exchange ideas and learn from each other's perspectives. Overall, the module's delivery approach aims to actively engage students, refine their critical thinking skills, and provide them with practical experiences in image processing. By combining theoretical knowledge with hands-on activities, students will develop a deeper understanding of image processing concepts and their applications in various fields.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction – image processing and its applications
Week 2	Computer vision and image processing
Week 3	image equalization
Week 4	Sampling and quantization
Week 5	Image enhancement, regression techniques
Week 6	Image interpolation
Week 7	Mid-term Exam
Week 8	Image analysis
Week 9	Image zooming, shrinking techniques
Week 10	Image histogram
Week 11	Histogram equalization
Week 12	Convolution

Week 13	Filtering
Week 14	Compression
Week 15	Loss and lossless methods in image compression
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: read image in MATLAB environment
Week 2	Lab 2: digital binary representation
Week 3	Lab 3: gray scale image transformation
Week 4	Lab 4: perform mathematical operation in image processing
Week 5	Lab 5: apply convolution in image processing
Week 6	Lab 6: apply filtering process
Week 7	Lab 7: Filters

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Digital Image Processing" by Rafael C. Gonzalez and Richard E. Woods "Digital Image Processing: An Algorithmic Introduction Using Java" by Wilhelm Burger and Mark J. Burge "Image Processing, Analysis, and Machine Vision" by Milan Sonka, Vaclav Hlavac, and Roger Boyle	Yes
Recommended Texts	"Digital Image Processing" by Rafael C. Gonzalez and Richard E. Woods	No
Websites		

Grading Scheme

مخطط الدرجات

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

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

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Research Methodology</u>		Module Delivery	
Module Type			☒ Theory ☒ Lecture ☐ Lab ☐ L Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>COM-316</u>			
ECTS Credits	<u>2</u>			
SWL (hr/sem)	<u>50</u>			
Module Level	UGI	Semester (s) offered		1
Administering Department	Department of Computer Science	College	College of Science	
Module Leader	Qusay Kanaan Kadhim		e-mail	dr.qusay.kanaan@uodiyala.edu.q
Module Leader's Acad. Title	Asst. Prof. Dr.		Module Leader's Qualification	Ph. D.
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	1/9/2025		Version Number	1.0

Relation with Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes, Indicative Contents and Brief Description			
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر			
Module Aims أهداف المادة الدراسية	1. This course aims to introduce students to the fundamentals and concepts of scientific research.		

	- It will enable students to select appropriate research methods for addressing academic problems. - Students will learn how to formulate research questions, hypotheses, and data collection tools.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Understanding different scientific research methodologies (qualitative, quantitative, experimental). - Ability to formulate a research problem and develop hypotheses. - Preparing data collection tools and analyzing the data. - Writing a comprehensive research report according to academic standards.
Indicative Contents المحتويات الإرشادية	This course covers the fundamentals of scientific research and its various types, equipping students to identify research problems, formulate hypotheses, and select appropriate data collection and analysis methods, both quantitative and qualitative. Students apply these concepts in practice through writing research reports and completing small research projects, while adhering to ethical research standards and academic citation practices. Continuous assessment is used to foster critical thinking, practical skills, and student independence in conducting research.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	This course emphasizes active and interactive learning, engaging students in discussions and practical exercises on the definition of scientific research, its types, research design, and hypothesis formulation. Practical learning is reinforced through small research projects, data collection and analysis, and the preparation of research reports. Continuous assessment is integrated through assignments, practical exercises, and research projects, with regular feedback provided to enhance performance before the final assessment. The course also promotes time management and academic organization skills through a weekly schedule of activities, preparing students to effectively manage comprehensive research projects..
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/yr) الحمل الدراسي المنتظم للطالب أسبوعياً
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/yr) الحمل الدراسي غير المنتظم للطالب أسبوعياً
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50	

Module Evaluation

تقييم المادة الدراسية

	Time (hr)	Weight (Marks)	Week Due	Relevant Learning Outcome
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Formative assessment	Quizzes	2	10% (20)	5, 10, 12, 15		All
	Assignments	1	10% (10)	2, 4, 6, 8, 10, 12	LO # 1, 3, 4, 5 and 6	
	Report	1	10% (10)	Continuous	LO # 1-5	
Summative assessment	Midterm Exam	1	10 (10)	7	LO # 1-3	
	Final Exam	3	50% (50)	16		All
Total assessment			100% (100 Marks)			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Definition of scientific research and its importance.
Week 2	Types of scientific research (qualitative, quantitative, mixed methods).
Week 3	Identifying the research problem and its objectives.
Week 4	Review of previous studies and research methods.
Week 5	Formulating hypotheses and research questions.
Week 6	Research design: experimental, descriptive, exploratory.
Week 7	Data collection tools (questionnaires, datasets, literature review).
Week 8	Data analysis: quantitative and qualitative.
Week 9	Writing the research report: introduction, literature review.
Week 10	Writing the report: results, discussion, conclusion.
Week 11	Ethics in scientific research and citation practices.
Week 12	Formulating conclusions and recommendations.
Week 13	Preparing a small research project.
Week 14	Presenting and discussing research projects.
Week 15	Comprehensive review and preparation for the final exam.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Websites		

GRADING SCHEME

مخطط الدرجات

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

Note:

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

المرحلة الثالثة

الكورس الثاني

فرع الحاسوب

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Computer Security		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	COM-323			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		
Administering Department	com	College	os	
Module Leader	Ghassan Sabeeh Mahmood		e-mail	ghassan@uodiyala.edu.iq
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	Master
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2025		Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-313	Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This course will provide a managerial perspective of computer security and what role they play in an organization. Students learn about the modern technologies and how organizations can use these technologies for their growth.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course provides the students with a deep understanding of how modern computer security schemes work. We introduce the necessary concepts in a way that is accessible for every student. This course has three goals. The first is to show the importance of theory to practice and of practice to theory. The second goal is to emphasize that computer security and cryptography are different. The third goal is to demonstrate that computer security is not just a science but also an art.
Indicative Contents المحتويات الإرشادية	This course introduces computer security technique. This course has been approved to satisfy the Comprehensive Articulation Agreement for transferability as a pre-major and/or elective course requirement. Home Works and Assignments Attendance is mandatory. Every class is important. All deadlines are hard. Under normal circumstances late work will not be accepted. Students are required to take all the tests. No make-up tests will be given under normal circumstances. Any form of cheating on exams/assignments/quizzes is subject to serious penalty Attendance 75% attendance is mandatory. Latecomers will be marked as absent. Evaluation Criteria Assignments/projects 20% Quizzes 10% Mid-Term 20% Final 50%

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	s.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	200		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Overview of Computer Security
Week 2	Cryptography
Week 3	Key Management
Week 4	Authentication
Week 5	Representing Identity
Week 6	Access Control
Week 7	Evaluating Systems
Week 8	MID TERMS
Week 9	Malicious Logic
Week 10	Vulnerability Analysis
Week 11	Auditing
Week 12	Intrusion Detection
Week 13	Network Security
Week 14	Software Security
Week 15	User Security
Week 16	FINAL EXAMS

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Cryptography
Week 2	Key Management
Week 3	Authentication
Week 4	Representing Identity
Week 5	Access Control
Week 6	Vulnerability Analysis
Week 7	Auditing
Week 8	Intrusion Detection
	Network Security
	Software Security
	User Security

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Bishop, Matt. <i>Introduction to computer security</i> . Vol. 50. Boston: Addison-Wesley, 2005.	Yes
Recommended Texts	Stallings, William. <i>Computer security principles and practice</i> . 2015.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	<u>Distributed Database</u>	Module Delivery
Module Type	<u>Core</u>	☒ Theory ☒ Lecture ☒ Lab
Module Code	COM-325	

ECTS Credits	5	☐ Tutorial ☐ Practical ☐ Seminar	
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	6
Administering Department	com	College	os
Module Leader	Zainab Mohammed Ali	e-mail	zainab_m@uodiyala.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This course will enable students to Provide a strong foundation in database concepts, technology, and practice. Practice SQL programming through a variety of database problems. Demonstrate the use of concurrency and transactions in database Design and build database applications for real world problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The students should be able to: Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS. Use Structured Query Language (SQL) for database manipulation. Design and build simple database systems Design and build GUI application to interact with databases.
Indicative Contents المحتويات الإرشادية	This subject serves as an introduction to data modelling and databases from a technical and data management perspective. The subject will include Entity Relationship modelling (from conceptual design to physical modelling), normalization, de-normalization, relational model and relational algebra, SQL, query processing and query optimization, transactions, storage

	organization, database administration, data warehousing and big data analytics. Other topics in data management and DBMS technology with an overview of modern MySQL systems may also be included.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	s.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Relational Algebra
Week 2	Selection in relational algebra
Week 3	Projection in relational algebra

Week 4	SET Operations - semantics
Week 5	Set operations - requirements (part 1)
Week 6	Set operations requirements (part 2)
Week 7	Database Keys
Week 8	Primary Key & Foreign Key
Week 9	Secondary Key or Alternative Key
Week 10	Examples on databases keys
Week 11	Normalization
Week 12	Un-Normalized Form (UNF)
Week 13	First-Normal Form (1NF)
Week 14	Second-Normal Form (2NF)
Week 15	Third-Normal Form (3NF)
Week 16	FINAL EXAMS

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to SQL
Week 2	Create Table Construct
Week 3	The select Clause
Week 4	The where Clause
Week 5	Set Operations
Week 6	Subqueries in the From Clause
Week 7	Modification of the Database
Week 8	project

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	FUNDAMENTALS OF Database Systems, SIXTH EDITION, Ramez Elmasri & Shamkant B. Navathe	NO
Recommended Texts	Database system concepts', 6th Edition – Abraham Silberschatz, Henry Korth, S, Sudarshan, (McGraw Hill International)	No

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information						
معلومات المادة الدراسية						
Module Title	<u>Pattern Recognition</u>		Module Delivery			
Module Type	<u>Elective</u>		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar			
Module Code	<u>COM-326</u>					
ECTS Credits	<u>5</u>					
SWL (hr/sem)	<u>125</u>					
Module Level	3	Semester of Delivery		7		
Administering Department	com		College	os		
Module Leader	Adil Abdulwahhab Al-Azzawi		e-mail	adil_alazzawi@uodiyala.edu.iq		
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.		
Module Tutor			e-mail	E-mail		
Peer Reviewer Name			e-mail	E-mail		
Scientific Committee Approval Date	02/06/2025		Version Number	.0		

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This course covers the techniques and gain proficiency of pattern recognition that are fundamental to a wide variety of application areas such as medical research, biometrics, computer vision, etc.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	55. Understands basic structure of pattern recognition systems. 56. Summarizes execution of a pattern recognition system. 57. Expresses principal units within a pattern recognition system. 58. Defines the relationship between pattern and feature. 59. Explains supervised and unsupervised pattern recognition approaches. 60. Analyzes the success of a feature recognition system.
Indicative Contents المحتويات الإرشادية	1. Introduction to Pattern Recognition, Feature Detection, Classification 2. Review of Probability Theory, Conditional Probability and Bayes Rule 3. Random Vectors, Expectation, Correlation, Covariance 4. Review of Linear Algebra, Linear Transformations 5. Decision Theory, ROC Curves, Likelihood Ratio Test 6. Linear and Quadratic Discriminants, Fisher Discriminant 7. Sufficient Statistics, Coping with Missing or Noisy Features 8. Template-based Recognition, Feature Extraction 9. Eigenvector and Multilinear Analysis 10. Training Methods, Maximum Likelihood and Bayesian Parameter Estimation 11. Linear Discriminant/Perceptron Learning, Optimization by Gradient Descent

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Pattern recognition theory and practice is concerned with the design, analysis, and development of methods for the classification or description of patterns, objects, signals, and processes. At the heart of this discipline is our ability to infer the statistical behavior of data from limited data sets, and to assign data to classes based on generalized notions of distances in a probabilistic space. Many commercial applications of pattern recognition exist today, including voice recognition (e.g., Amazon Alexa), fingerprint classification (e.g., MacBook Pro touch bar), and retinal scanners (e.g., your favorite cheesy sci-fi movie).
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3 and 9	
	Assignments	2	10% (10)	5 and 11	
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	
Summative assessment	Midterm Exam	2hr	10% (10)	7	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction: An Overview of Machine Learning
Week 2	Decision Theory: Bayes Rule
Week 3	Decision Theory: Gaussian Classifiers
Week 4	Decision Theory: Generalized Gaussian Classifiers
Week 5	Parameter Estimation: Maximum Likelihood
Week 6	Parameter Estimation: The Bayesian Approach
Week 7	Mid-term Exam
Week 8	Decision Theory: Discriminant Analysis
Week 9	Parameter Estimation: The Expectation Maximization Theorem
Week 10	Parameter Estimation: Discriminative Training
Week 11	Experimental Design: Foundations of Machine Learning
Week 12	Experimental Design: Evaluation
Week 13	Statistical Significance
Week 14	Jackknifing, Bootstrapping and Combining Classifiers

Week 15	Introduction to Nonparametric Techniques
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Gaussian Distributions
Week 2	Bayesian Decision Theory
Week 3	ML and Bayesian Parameter Estimation
Week 4	Linear Discriminant Analysis
Week 5	
Week 6	Expectation Maximization (EM)
Week 7	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	A. Lindholm, N. Wahlstrom, F. Lindsten and T. Schon, Machine Learning: A First Course for Engineering and Scientists, Cambridge University Press, New York, New York, USA, ISBN: 978-1-108-84360-7, pp. 338, 2022. URL: http://smlbook.org/book/sml-book-draft-latest.pdf	Yes
Recommended Texts	C.M. Bishop, Pattern Recognition and Machine Learning, Springer, ISBN: 978-0387310732, 2003.	No
Websites	https://isip.piconepress.com/courses/temple/ece_8527/syllabus/current/	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	<u>Knowledge Representation</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>COM-324</u>				
ECTS Credits	<u>4</u>				
SWL (hr/sem)	<u>100</u>				
Module Level	Undergraduate	Semester of Delivery		6	
Administering Department	Type Dept. Code	College	Type College Code		
Module Leader	Asraa safaa ahmed		e-mail	asraasafaa@uodiyala.edu.iq	
Module Leader's Acad. Title	Asso. Prof.		Module Leader's Qualification		Dr.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2025		Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-312	Semester	5
Co-requisites module	None	Semester	

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

	To provide students with an understanding of logic and logic-based knowledge representation formalisms, ontologies, and their theoretical and practical aspects, some relevant reasoning services, and how these are used to support modelling.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge & Understanding: By the end of the study-unit the student will be able to: - Define and describe knowledge representation, its motivations, applicability, advantages and pitfalls; - Describe and categorise some basic KR formalisms namely first-order and description logics; - Explain how automated reasoning can be used to help with modelling. 2. Skills: By the end of the study-unit the student will be able to: - Apply the basic range of techniques for building knowledge representations using standard tooling; - Analyse and compare different knowledge representations for specific tasks; - Design ontologies; - Evaluate knowledge representation techniques.		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • Classical logic • Existential graphs • Logic and language • Higher-order logic and modal logic • Automated theorem provers • Prolog • Datalog • Semantic networks and conceptual graphs • Semantic Web, RDF, Turtle, SPARQL • Description Logic and OWL ontologies • Intuitionistic and relevant logic		

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Knowledge Acquisition
Week 2	Concepts of Knowledge engineering
Week 3	Methods of acquiring knowledge
Week 4	Introduction to Knowledge Representation
Week 5	Knowledge Representation Application
Week 6	Knowledge Representation Methods
Week 7	Automated Acquiring Knowledge from Data and Documents
Week 8	Midterm exam
Week 9	First order logic: syntax, semantics, proof theory, and applications,
Week 10	Description logics: syntax, semantics, proof theory, and applications
Week 11	Logic engineering
Week 12	Ontology
Week 13	Owl, RDF, Protégé
Week 14	Modeling
Week 15	Project presentation
Week 16	Preparatory week before the final Exam

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

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Van Harmelen, Frank, Vladimir Lifschitz, and Bruce Porter, eds. Handbook of knowledge representation. Elsevier, 2008.	Yes
Recommended Texts	Alechina, N. "Knowledge Acquisition, Representation, and Reasoning." United Kingdom (2012).	No
Websites		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Software Engineering		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	COM-321			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	3		Semester of Delivery	6
Administering Department	com	College	os	
Module Leader	Wasan Saad Ahmed		e-mail	wasan@uodiyala.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Master	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2025		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	During this course, students will be able to: 1. List and describe the fundamental phases of the Software Development Lifecycle (SDLC) 2. Define and describe fundamental software engineering terminology and coding practices 3. Explore/explain relationships between software engineering and other engineering disciplines (Systems Engineering, Electrical and Computer Engineering, Industrial Engineering) 4. Modify/build a software program that introduces students to software development tools / environments 5. Troubleshoot and debug changes made to an existing software program 6. Develop an original Python software program, learning basic Python language syntax 7. Build a foundation for academic success in the Software Engineering degree program
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon the completion of this course, students should be able to: 1) Describe basic software development and computing fundamentals that make up the Software Development Lifecycle. 2) Explore relationships between software engineering and other engineering disciplines (Systems Engineering, Electrical and Computer Engineering, Industrial Engineering, and Computer Science). 3) Modify basic software programs and verify functionality of all changes made using Python programming language / integrated development environment (IDE) tools. 4) Experiment with and use traditional software development process and testing tools, such as configuration management, interpreters/compilers and debuggers. 5) Analyze the functionality and performance of software application programs 6) Compare and contrast how diverse software applications produce solutions to meet specific objectives/needs in a variety of fields including, but not limited to public health, safety, global, cultural, social, environmental, and economic applications 7) Demonstrate and communicate software engineering principles effectively through written reports and/or verbal presentations. 8) Summarize both ethical and professional responsibilities of a software engineer.
Indicative Contents المحتويات الإرشادية	This course introduces Software engineering technique. This course has been approved to satisfy the Comprehensive Articulation Agreement for transferability as a pre-major and/or elective course requirement. Home Works and Assignments Attendance is mandatory. Every class is important. All deadlines are hard. Under normal circumstances late work will not be accepted. Students are required to take all the tests. No make-up tests will be given under normal circumstances. Any form of cheating on exams/assignments/quizzes is subject to serious penalty Attendance 75% attendance is mandatory. Latecomers will be marked as absent. Evaluation Criteria Assignments/projects 20% Quizzes 10% Mid-Term 20% Final 50%

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	49	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem)	51	Unstructured SWL (h/w)	3

الحمل الدراسي غير المنتظم للطالب أسبوعيا		الحمل الدراسي غير المنتظم للطالب خلال الفصل
Total SWL (h/sem)	100	الحمل الدراسي الكلي للطالب خلال الفصل

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to the Software Engineering
Week 2	Engineering Lifecycle (SDLC)
Week 3	Software Requirements Analysis
Week 4	Software Architecture and Design
Week 5	Software classifications
Week 6	development of the software
Week 7	Software Project Management
Week 8	MID TERMS
Week 9	Requirements Engineering
Week 10	UML modeling language
Week 11	UML modeling language
Week 12	Design of reuse, design patterns
Week 13	Software testing
Week 14	Software quality
Week 15	Functional and nonfunctional requirements
Week 16	FINAL EXAMS

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Project selection and team organization
Week 2	Collecting data from real institutions
Week 3	Defining problem requirements, entities W and attributes
Week 4	Requirement analysis
Week 5	Requirements specifications
Week 6	Design process for problem solution
Week 7	Data Design for problem solution
Week 8	Mid-term exam
9Week	Detailed design for processes and W data
10Week	Coding
11Week	Testing and evaluation
12Week	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	.Addison-Wesley, second ed. ,Budgen, 2019, "Software Engineering"	Yes
Recommended Texts	-Sommerville, Ian ,2019, Software Engineering, Addison-Wesley , Boston, MA.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
Module Title	Artificial Intelligence		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	COM-312			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		6
Administering Department	Computer Science	College	College of Science	
Module Leader	Prof. Dr. Hassan Hadi Saleh	e-mail	Hassan.hadi@uodiyala.edu.iq	
Module Leader's Acad. Title	Professor	Module Leader's Qualification		Ph.D.
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	1-6-2025	Version Number	.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Programming fundamentals, data structures, elementary linear algebra, probability and differentiation. Official prerequisite module codes are set by the department.	Semester	
Co-requisites module	None proposed. Python revision is embedded in the opening laboratory.	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This module develops the ability to model intelligent behaviour, solve problems through search, and build and evaluate introductory machine learning and neural network models. Weekly laboratories connect the theory to reproducible Python experiments. 1. Explain the principal approaches to artificial intelligence and the role of rational agent in designing intelligent systems. 2. Develop formal problem representations and select search methods using solution quality and computational requirements. 3. Connect machine learning concepts to the construction and evaluation of simple predictive models. 4. Establish the foundations needed to understand neural network training and convolutional architectures. 5. Develop practical programming, experimental reasoning and technical communication through documented laboratory work. Module Learning Outcomes On successful completion, the student will be able to achieve the following observable outcomes. The same LO identifiers are used in the weekly plans and assessment table.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On successful completion, the student will be able to achieve the following observable outcomes. The same LO identifiers are used in the weekly plans and assessment table.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• Lectures • Tutorials • Problem solving
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- Lab
- Case study
- Small project

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome	
Formative assessment	Quizzes	2 × 30 min	10% (10)	Weeks 5, 11	LO #1, #2 and #10,	#11
	Assignments	2 assignments	10% (10)	Weeks 6, 10	LO #3, #4 and #6	#7
	Projects / Lab.	Portfolio, practical test and project demonstration	10% (10)	Weeks 1–15; test and demo in 15		All
	Report	1 project report and an individual seminar contribution	10% (10)	Week 15	LO #5, #8 and	#10
Summative assessment	Midterm Exam	2hr	10% (10)		LO #1	#7
	Final Exam	2hr	50% (50)			All
Total assessment			100% (100 Marks)			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered	
Week 1	AI foundations and scope Definitions of intelligence and AI; the four classical approaches; a short historical timeline; capabilities and limits; the relationship between AI, ML and DL. Use a small set of application examples to distinguish perception, reasoning and learning.	
Week 2	Rational agents and environments Percepts, actions, agent function and architecture; rationality and performance measures; PEAS specification; observability, uncertainty, dynamics and multiple agents; reflex, model-based, goal-based, utility-based and learning agents.	
Weeks 3	Problem formulation and state-space search	

	Initial state, actions, transition model, goal test and path cost; state versus search node; frontier and explored set; tree versus graph search. Formulate route planning, the vacuum world and the 8-puzzle. Introduce completeness, optimality, time and memory. Learning check: Write one formal problem definition and identify repeated states in its search graph.
Weeks 3	Uninformed search BFS, DFS and uniform-cost search; depth-limited and iterative-deepening search; queue, stack and priority-queue behaviour; cycle handling. Compare algorithm properties under clearly stated assumptions about finite branching, edge costs and state repetition.
Week 4	Informed search and heuristics Heuristic functions; greedy best-first search and A*; the roles of path cost and estimated remaining cost; admissibility and consistency; handling better paths to an existing state. Relate optimality to the selected graph-search implementation.
Week 5	AI foundations and scope Definitions of intelligence and AI; the four classical approaches; a short historical timeline; capabilities and limits; the relationship between AI, ML and DL. Use a small set of application examples to distinguish perception, reasoning and learning.
Weeks 6	Local search and optimisation State-space landscapes; objective functions; hill climbing, local optima and plateaus; random restarts; simulated annealing and temperature. Use N-Queens to distinguish finding a good configuration from finding a minimum-cost path. Learning check: Compare success rate and objective value across repeated runs. Submit Assignment 1.
Weeks 7	Adversarial search and games
Weeks 8	Machine learning foundations and midterm One hour of new theory: learning from experience; task, performance and experience; features and labels; supervised, unsupervised and reinforcement learning; regression versus classification. The 2-hour midterm covers Weeks 1–7. Use the tutorial and seminar for dataset examples and project framing.
Weeks 9	Supervised learning and model evaluation A simple decision-tree classifier and linear-regression baseline; training, validation and test roles; fitting preprocessing only on training data; confusion matrices, accuracy, precision, recall, F1 and mean absolute error. Introduce overfitting and model selection.
Weeks 10	Neural network foundations Artificial neurons, weights and bias; perceptron limitations; activation functions; multilayer perceptrons; forward propagation; output choices for regression and classification; loss functions and the distinction between a parameter and a hyperparameter.
Weeks 11	Training neural networks and generalisation Gradient descent, learning rate, batches and epochs; backpropagation as application of the chain rule; training versus inference; learning curves; underfitting and overfitting; weight penalties, dropout and early stopping.
Weeks 12	Convolutional neural network operations Images as tensors; local receptive fields and shared weights; filters, channels and feature maps; stride and padding; nonlinear activation; max pooling; flattening and dense layers. Calculate output dimensions and parameters for a small network.
Weeks 13	CNN training and interpretation Prepare image data; define and train a small CNN; inspect learning curves and classification errors; compare against an MLP baseline on the same split. Use feature maps and selected saliency examples to discuss what visualisation can and cannot explain.
Weeks 14	Selected CNN architectures Compare LeNet, AlexNet, VGG, Inception and residual connections through their design principles. Analyse depth, parameter counts and computational demand. Use selected worked examples rather than reproducing the entire architecture slide bank.
Week 15	Integrated AI applications and review

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Python environment and reproducible notebooks
Week 2	A simple rational agent
Week 3	State-space representation
Week 4	BFS DFS and uniform-cost search
Week 5	Greedy search and A*
Week 6	Local search on N-Queens
Week 7	Minimax and alpha-beta pruning
Week 8	Learning tasks and dataset preparation
Week 9	Supervised baseline and evaluation
Week 10	Neurons and forward propagation
Week 11	Training an MLP
Week 12	Convolution pooling and tensor shapes
Week 13	Training and evaluating a CNN
Week 14	Architecture comparison and project consolidation
Week 15	Individual practical assessment and project demonstration

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, 4th edition. Selected sections on agents, search, machine learning and deep learning. Chapter numbering differs between US and Global editions.	Yes
Recommended Texts	Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016. Chapters 6–9 for feedforward networks, regularisation, optimisation and CNNs.	No
Websites	https://aima.cs.berkeley.edu/	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria

Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

المرحلة الثالثة
الكورس الأول
فرع الامن السبراني

MODULE DESCRIPTION FORM

MODULE DESCRIPTION FORM

Module Information				
Module Title	<u>Security of Social Media</u>		Module Delivery	
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CYB-304</u>			
ECTS Credits	<u>4</u>			
SWL (hr/sem)	<u>100</u>			
Module Level	UO	Semester of Delivery		
Administering Department	Com	College	CoS	
Module Leader	Hassan Hadi Saleh		e-mail	Hassan.hadi@uodiyala.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	E-mail
Peer Reviewer Name			e-mail	E-mail
Scientific Committee Approval Date			Version Number	.0

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

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	This module aims to provide students with an in-depth understanding of security challenges in social media platforms, the techniques for protecting users and organizations, and the legal/ethical considerations. It focuses on enabling students to analyze threats, apply appropriate defense mechanisms, and design secure strategies for both individuals and enterprises.
Module Learning Outcomes	By the end of the module, students will be able to: 1. Define the fundamental principles of social media security and privacy concepts. 2. Identify and analyze security threats including phishing, impersonation, malware, botnets, and fake accounts. 3. Apply defense mechanisms such as multi-factor authentication (MFA), encryption, and secure authentication protocols. 4. Evaluate privacy concerns, legal frameworks, and ethical issues in managing social media data. 5. Conduct basic forensic investigations and open-source intelligence (OSINT) analysis using specialized tools. 6. Design security policies, awareness campaigns, and protective strategies for individuals and organizations. 7. Collaborate effectively in teams to solve case studies and real-world security challenges in social media environments.
Indicative Contents	• Introduction to Social Media and Cybersecurity ○ Evolution of social media platforms ○ Importance of securing digital communication ○ Overview of risks and vulnerabilities • Threats and Attacks in Social Media ○ Social engineering and phishing ○ Identity theft and impersonation ○ Fake accounts, botnets, and malware distribution ○ Case studies of real-world breaches • Privacy and Data Protection ○ User profiling and metadata leakage

	○ Third-party applications and risks ○ Privacy policies, consent, and compliance frameworks (GDPR, CCPA) • Platform Security Features and Weaknesses ○ Authentication mechanisms (2FA, OAuth) ○ API security risks ○ Platform misconfigurations and vulnerabilities • Misinformation, Disinformation, and Fake News ○ Propaganda campaigns and influence operations ○ Role of bots and deepfakes ○ Detection methods and fact-checking strategies • Social Media Forensics and OSINT ○ Evidence collection and legal considerations ○ Tools for investigation (Maltego, SpiderFoot, Social Bearing) ○ Open-source intelligence in security contexts • Legal and Ethical Aspects ○ Cyber laws and regulations affecting social media ○ Ethical hacking vs. cyberstalking ○ Government surveillance and censorship • Threat Intelligence from Social Media ○ Real-time detection of emerging threats ○ AI/ML applications in analyzing social media feeds ○ Monitoring dark web and underground channels • Protecting User Accounts and Organizational Presence ○ Best practices for individuals (passwords, privacy settings) ○ Securing enterprise and institutional social media accounts ○ Brand impersonation protection strategies • Designing Secure Social Media Strategies ○ Security awareness campaigns ○ Policies for education, corporate, and government sectors ○ Future directions: decentralized and federated networks (e.g., Mastodon, Bluesky)
Learning and Teaching Strategies	
Strategies	The module will be delivered through a combination of lectures, laboratory sessions, and case studies to ensure both theoretical understanding and practical application. • Lectures: Provide students with the foundational knowledge of social media security, including key concepts, threats, defense mechanisms, and legal/ethical issues. • Laboratory Sessions: Engage students in hands-on activities such as phishing simulations, social media forensics, metadata analysis, OSINT investigations, and configuring privacy/security settings on social platforms. • Case Studies and Problem-Based Learning (PBL):

	Students will analyze real-world social media breaches and misinformation campaigns, discuss vulnerabilities, and propose security strategies. • Collaborative Projects: Group-based projects will encourage teamwork, critical thinking, and the design of secure social media strategies for individuals, enterprises, and organizations. • Interactive Tutorials: Tutorials will reinforce learning by guiding students through tool usage (e.g., Maltego, SpiderFoot, Wireshark, Burp Suite) and applying security frameworks in simulated environments. • Guest Lectures / Seminars (optional): Experts from the cybersecurity field may be invited to share insights on emerging threats, deepfake detection, and AI-based defense mechanisms. This integrated approach will ensure that students not only gain theoretical knowledge but also acquire practical skills that prepare them for addressing real-world challenges in social media security.
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Student Workload (SWL)

Structured SWL (h/sem)	64	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	68	Unstructured SWL (h/w)	4
Total SWL (h/sem)	150		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5)	4 and 8	
	Assignments	2	10% (5)	Continue	
	Projects / Lab.	1	10% (10)	10	
	Report	1	10% (10)	13	
Summative assessment	Midterm Exam	1hr	10% (10)	14	
	Final Exam	2hr	50% (50)	15	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week 1	Introduction to Social Media and Cybersecurity • Evolution of social media platforms • Role in digital communication and society • Importance of securing social networks • Overview of major platforms (Facebook, Twitter/X, Instagram, TikTok, LinkedIn)
Week 2	Threats and Attacks in Social Media (I)

	• Social engineering attacks • Phishing and spear phishing via social media	
Week 3	• Identity theft and impersonation • Fake accounts and botnets • Case studies of real-world social media breaches	Threats and Attacks in Social Media (II)
Week 4		Quiz 1
Week 5	• User profiling and metadata leakage • Privacy policies and consent	Privacy and Data Protection (I)
Week 6	• Risks of third-party applications • Exposure of location and behavioral data	Privacy and Data Protection (II)
Week 7	• Security models of major social media platforms • Authentication mechanisms (2FA, OAuth) • API security risks • Common platform misconfiguration	Platform Security Features and Weaknesses
Week 8		Quiz 2
Week 9	• Propaganda campaigns and influence operations • Role of bots and deepfakes	Misinformation, Disinformation, and Fake News (I)
Week 10	• Detection techniques and fact-checking platforms • Case studies: Elections, COVID-19, conflict zone	Misinformation, Disinformation, and Fake News (II)
Week 11	• Evidence collection from social platforms • Chain of custody and legal admissibility	Social Media Forensics (I)
Week 12	• Open-source intelligence (OSINT) from social media	Social Media Forensics (II)
Week 13		Tools: Maltego, SpiderFoot, Social Bearing, TweetDeck
Week 14		Ethical and Policy Issues – surveillance, censorship, ethical hacking vs. cyberstalking
Week 15		Case Studies of Social Media Breaches – Facebook, Twitter, TikTok, and LinkedIn incidents
Week 15		Final exam
Delivery Plan (Weekly Lab. Syllabus)		
		Material Covered
Week 1	• Overview of lab environment and safety • Introduction to OSINT tools (Maltego, SpiderFoot)	Introduction to Social Media Security Tools
Week 2	• Creating controlled phishing scenarios in a lab-safe environment • Analyzing phishing email/messages sample	Phishing Simulation (I)
Week 3	• Detecting spear-phishing attempts • Setting up filters and detection mechanisms	Phishing Simulation (II)

Week 4	- Creating and detecting fake profiles (lab simulation) - Extracting metadata from social media posts	Fake Accounts and Metadata Analysis (I)
Week 5	- Case study: analyzing bot activity - Using automation detection tools	Fake Accounts and Metadata Analysis (II)
Week 6	- Applying MFA and secure login methods - Configuring advanced privacy settings on sample accounts	Authentication and Privacy Settings
Week 7	Midterm Practical Exam	
Week 8	- Using Wireshark to analyze suspicious traffic - Identifying malware indicators in social media communications	Malware and Botnet Tracing (I)
Week 9	- Practical exercise on botnet command & control simulations - Reporting indicators of compromise (IoCs)	Malware and Botnet Tracing (II)
Week 10	- Evidence collection procedures - Preserving chain of custody	Social Media Forensics (I)
Week 11	- OSINT case study investigation - Practical with SpiderFoot and TweetDeck	Social Media Forensics (II)
Week 12	- Conducting forensic analysis ethically - Understanding boundaries of ethical hacking	Legal & Ethical Considerations in Lab Practices
Week 13	- Monitoring social feeds for threat indicators - Simulated dark web monitoring	Threat Intelligence Exercise
Week 14	- Hands-on with AI-based detection tools - Comparing real vs manipulated media	Deepfake Detection Workshop
Week 15	Final Practical Exam	

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Cybersecurity for Beginners” by Raef Meeuwisse (intro reading)	NO
Recommended Texts	Investigating Social Media: Understanding User Data and Protecting Privacy by Routledge	NO
	Social Media Mining: An Introduction – Reza Zafarani, Mohammad Ali Abbasi, Huan Liu (2014)	
Electronic Materials	Cybersecurity and Social Media: Threats and Countermeasures	

Grading Scheme

مخطط الدرجات

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

	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Research Methodology</u>		Module Delivery	
Module Type			☒ Theory ☒ Lecture ☐ Lab ☐ L Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>COM-316</u>			
ECTS Credits	<u>2</u>			
SWL (hr/sem)	<u>50</u>			
Module Level	UGI	Semester (s) offered		1
Administering Department	Department of Computer Science	College	College of Science	
Module Leader	Qusay Kanaan Kadhim		e-mail	dr.qusay.kanaan@uodiyala.edu.q
Module Leader's Acad. Title	Asst. Prof. Dr.		Module Leader's Qualification	Ph. D.
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	1/9/2025		Version Number	1.0

Relation with Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes, Indicative Contents and Brief Description أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر			
Module Aims أهداف المادة الدراسية	4. This course aims to introduce students to the fundamentals and concepts of scientific research. 5. It will enable students to select appropriate research methods for addressing academic problems. 6. Students will learn how to formulate research questions, hypotheses, and data collection tools.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	5. Understanding different scientific research methodologies (qualitative, quantitative, experimental). 6. Ability to formulate a research problem and develop hypotheses. 7. Preparing data collection tools and analyzing the data. 8. Writing a comprehensive research report according to academic standards.		
Indicative Contents المحتويات الإرشادية	This course covers the fundamentals of scientific research and its various types, equipping students to identify research problems, formulate hypotheses, and select appropriate data collection and analysis methods, both quantitative and qualitative. Students apply these concepts in practice through writing research reports and completing small research projects, while adhering to ethical research standards and academic citation practices. Continuous assessment is used to foster critical thinking, practical skills, and student independence in conducting research.		

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This course emphasizes active and interactive learning, engaging students in discussions and practical exercises on the definition of scientific research, its types, research design, and hypothesis formulation. Practical learning is reinforced through small research projects, data collection and analysis, and the preparation of research reports. Continuous assessment is integrated through assignments, practical exercises, and research projects, with regular feedback provided to enhance performance before the final assessment. The course also promotes time management and academic organization skills through a weekly schedule of activities, preparing students to effectively manage comprehensive research projects..

Student Workload (SWL) الحمل الدراسي للطالب		
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)

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

Module Evaluation

تقييم المادة الدراسية

		Time (hr)	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (20)	5, 10, 12, 15	All
	Assignments	1	10% (10)	2, 4, 6, 8, 10, 12	LO # 1, 3, 4, 5 and 6
	Report	1	10% (10)	Continuous	LO # 1-5
Summative assessment	Midterm Exam	1	10 (10)	7	LO # 1-3
	Final Exam	3	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Definition of scientific research and its importance.
Week 2	Types of scientific research (qualitative, quantitative, mixed methods).
Week 3	Identifying the research problem and its objectives.
Week 4	Review of previous studies and research methods.
Week 5	Formulating hypotheses and research questions.
Week 6	Research design: experimental, descriptive, exploratory.
Week 7	Data collection tools (questionnaires, datasets, literature review).
Week 8	Data analysis: quantitative and qualitative.
Week 9	Writing the research report: introduction, literature review.
Week 10	Writing the report: results, discussion, conclusion.
Week 11	Ethics in scientific research and citation practices.
Week 12	Formulating conclusions and recommendations.
Week 13	Preparing a small research project.
Week 14	Presenting and discussing research projects.
Week 15	Comprehensive review and preparation for the final exam.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts		
Websites		

GRADING SCHEME

مخطط الدرجات

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

Note:

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Digital Image Processing			Module Delivery
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	COM-314			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		
Administering Department	com	College		
Module Leader	Abdulbasit Kadhim Shukur		e-mail	dr.abdulbasit@uodiyala.edu.iq
Module Leader's Acad. Title	Ast.Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2025		Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-222	Semester	4
Co-requisites module	None	Semester	

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

أهداف المادة الدراسية	15. To develop Image processing skills and understanding of circuit theory through the application of techniques. 16. To understand analog Image, digital image and mathematical model of one- and two-dimensional signal (image). 17. This course deals with the basic concept of image equalization, sampling and quantization. 18. To understand image enhancement, image degradation and image compression. 19. To understand mathematical and logical concepts of image. 20. To understand convolution and filtering in image processing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 61. Recognize how the image equalization process works. 62. Image sampling and quantization. 63. Summarize what is meant by spatial and frequency domain. 64. Discuss image enhancement and image restoration process. 65. Describe lineal interpolation, bilinear interpolation. 66. Define the adjacency in image processing. 67. Identify the basic arithmetic operation in image. 68. Identify the basic logic operation in image. 69. Discuss zero order hold and first order hold in image analysis 70. Discuss the operations of convolution in image processing. 71. Discuss the concepts of filters in image processing. 72. Edge detection filters and smoothing filters. 73. Image histogram 74. Image histogram equalization 75. Image compression 76. Lose and lose less methods in image compression
Indicative Contents المحتويات الإرشادية	16. Introduction to Digital Image Processing: • Overview of image processing and its applications. • Fundamental concepts and components of digital image processing system. • Image representation and visualization. 17. Image Enhancement: • Point processing techniques, such as histogram equalization and contrast stretching. • Spatial domain methods, including spatial filtering and image sharpening. • Frequency domain methods, such as Fourier transform and filtering in the frequency domain. 18. Image Restoration: • Noise models and noise removal techniques. • Image deblurring and restoration algorithms. • Image reconstruction from projections. 19. Color Image Processing: • Color models and color spaces. • Color transformation and manipulation. • Color image enhancement and restoration. 20. Image Compression: • Image compression techniques, including lossless and lossy compression. • Transform coding and predictive coding. • Image compression standards, such as JPEG and JPEG2000. 21. Morphological Image Processing: • Morphological operations, such as erosion, dilation, opening, and closing. • Structuring elements and their role in morphological operations. • Morphological image analysis and feature extraction. 22. Image Segmentation:

	• Image segmentation techniques, including thresholding, region-based segmentation, and edge detection. • Clustering algorithms for image segmentation. • Watershed segmentation and its applications. 23. Image Representation and Description: • Image representation using boundary and region descriptors. • Texture analysis and texture descriptors. • Object recognition and image classification. 24. Image Filtering and Restoration: • Image filtering techniques, including linear and nonlinear filters. • Adaptive and spatially variant filters. • Restoration techniques for removing blur, noise, and other distortions. 25. Image Analysis and Computer Vision: • Image analysis techniques, including object detection, tracking, and motion estimation. • Pattern recognition and machine learning in image processing. • Applications of image processing in computer vision.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering the image processing module is to engage students actively in practical exercises to enhance their understanding and develop their critical thinking skills. The module will include a combination of classes, interactive tutorials, and hands-on experiments focused on sampling activities that capture students' interest. Through interactive classes, students will be introduced to the theoretical foundations of image processing, including key concepts, techniques, and algorithms. The classes will provide a solid understanding of topics such as image enhancement, image restoration, image segmentation, and image analysis. To reinforce learning and encourage active participation, interactive tutorials will be conducted. These tutorials will involve hands-on exercises where students will work with real-world images and apply different image processing techniques. This practical approach will help students grasp the practical implications of the theoretical concepts discussed in the classes. In addition to tutorials, simple experiments will be introduced to provide students with opportunities to explore various sampling activities. These experiments will focus on real-life scenarios and problems related to image processing. Students will be encouraged to think critically, analyze the results, and propose solutions based on their understanding of the concepts learned. The module will also emphasize the importance of collaboration and teamwork. Students will be encouraged to work together on projects and assignments, fostering a collaborative learning environment where they can exchange ideas and learn from each other's perspectives.

Overall, the module's delivery approach aims to actively engage students, refine their critical thinking skills, and provide them with practical experiences in image processing. By combining theoretical knowledge with hands-on activities, students will develop a deeper understanding of image processing concepts and their applications in various fields.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – image processing and its applications
Week 2	Computer vision and image processing
Week 3	image equalization
Week 4	Sampling and quantization
Week 5	Image enhancement, regression techniques
Week 6	Image interpolation
Week 7	Mid-term Exam
Week 8	Image analysis

Week 9	Image zooming, shrinking techniques
Week 10	Image histogram
Week 11	Histogram equalization
Week 12	Convolution
Week 13	Filtering
Week 14	Compression
Week 15	Loss and lossless methods in image compression
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: read image in MATLAB environment
Week 2	Lab 2: digital binary representation
Week 3	Lab 3: gray scale image transformation
Week 4	Lab 4: perform mathematical operation in image processing
Week 5	Lab 5: apply convolution in image processing
Week 6	Lab 6: apply filtering process
Week 7	Lab 7: Filters

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Digital Image Processing" by Rafael C. Gonzalez and Richard E. Woods "Digital Image Processing: An Algorithmic Introduction Using Java" by Wilhelm Burger and Mark J. Burge "Image Processing, Analysis, and Machine Vision" by Milan Sonka, Vaclav Hlavac, and Roger Boyle	Yes
Recommended Texts	"Digital Image Processing" by Rafael C. Gonzalez and Richard E. Woods	No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria

Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

2026/2027

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Fundamentals of Cyber Security</u>		Module Delivery	
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	COM-			
ECTS Credits	<u>6</u>			
SWL (hr/sem)	<u>150</u>			
Module Level	U	Semester of Delivery	3	
Administering Department	Com	College	sci	
Module Leader	Ali Abdulrahman Mahmood		e-mail	alialani@uodiyala.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.	
Module Tutor		e-mail	E-mail	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	01/8//2025	Version Number	.0	

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Provide students with foundational knowledge of cybersecurity principles, threats, and defense mechanisms. 2. Develop students' ability to identify, analyze, and mitigate common cyberattacks and vulnerabilities.

	3. Introduce security models, policies, and cryptographic techniques as the basis of secure systems. 4. Prepare students to apply cybersecurity practices in real-world environments, focusing on both technical and ethical aspects.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Explain fundamental concepts of cybersecurity, including confidentiality, integrity, availability, authentication, and non-repudiation. 2. Identify common types of cyber threats (e.g., malware, phishing, denial-of-service) and describe corresponding defense strategies. 3. Apply basic cryptographic methods (symmetric, asymmetric, hashing) to secure data and communication. 4. Analyze system vulnerabilities and recommend appropriate security policies and controls. 5. Demonstrate awareness of legal, ethical, and professional issues in cybersecurity.
Indicative Contents المحتويات الإرشادية	Introduction to Cybersecurity • Security principles: CIA triad (Confidentiality, Integrity, Availability) • Cybersecurity challenges in modern systems Threats and Attacks • Malware: viruses, worms, trojans, ransomware • Social engineering and phishing attacks • Denial-of-Service (DoS/DDoS) attacks • Insider threats Security Mechanisms • Authentication and access control • Firewalls, Intrusion Detection/Prevention Systems (IDS/IPS) • Security in operating systems and networks Cryptography Fundamentals • Symmetric and asymmetric encryption • Public Key Infrastructure (PKI) • Hash functions and digital signatures Security Policies and Risk Management • Security policies, standards, and guidelines • Risk assessment and mitigation strategies • Incident response and disaster recovery Emerging Topics • Cloud security basics • Cybersecurity in IoT systems • Ethical and legal considerations in cybersecurity

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.

	- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc. - Attendance is compulsory in lecture which carries 10 marks in overall evaluation. - One internal exam will be conducted as a part of internal theory evaluation. - Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation. - Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation. - The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures. - Experiments shall be performed in the laboratory related to course contents.
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Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Cyber Security
Week 2	Types of Cyber Threats and Attacks
Week 3	Security of Operating Systems
Week 4	Network Security Fundamentals
Week 5	Cryptography Basics
Week 6	Authentication and Access Control

Week 7	Mid- term Exam
Week 8	Web and Application Security
Week 9	Cloud and IoT Security
Week 10	Cybersecurity Policies and Legal Issues
Week 11	Cybersecurity Tools and Practices
Week 12	Security policies and compliance
Week 13	Cybercrime laws and ethics
Week 14	Security issues in cloud computing
Week 15	Hashing and digital signatures
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Cyber Security
Week 2	Types of Cyber Threats and Attacks
Week 3	Security of Operating Systems
Week 4	Network Security Fundamentals
Week 5	Cryptography Basics
Week 6	Authentication and Access Control
Week 7	Midterm Exam
Week 8	Web and Application Security
Week 9	Cloud and IoT Security
Week 10	Cybersecurity Policies and Legal Issues
Week 11	Cybersecurity Tools and Practices
Week 12	Security policies and compliance
Week 13	Cybercrime laws and ethics
Week 14	Security issues in cloud computing
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Cybersecurity Essentials*** by Charles J. Brooks et al. 2. Computer Security: Principles and Practice*** by William Stallings & Lawrie Brown	Yes
Recommended Texts	1. NIST Cybersecurity Framework (free resource)	yes
Websites		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية						
Module Title	<u>Cryptography</u>		Module Delivery			
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar			
Module Code	<u>COM-313</u>					
ECTS Credits	<u>6</u>					
SWL (hr/sem)	<u>150</u>					
Module Level		Semester of Delivery		5		
Administering Department		College	os			
Module Leader	Ghassan Sabeeh Mahmood		e-mail	ghassan@uodiyala.edu.iq		
Module Leader's Acad. Title		Assistant Prof.	Module Leader's Qualification	Master		
Module Tutor	Name (if available)		e-mail	E-mail		
Peer Reviewer Name		Name	e-mail	E-mail		
Scientific Committee Approval Date		01/06/2025	Version Number	1.0		

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This course will provide a managerial perspective of Cryptography and what role they play in an organization. Students learn about the modern technologies and how organizations can use these technologies for their growth.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course provides the students with a deep understanding of how modern cryptographic schemes work. We introduce the necessary mathematical concepts in a way that is accessible for every student. This course focused on practical relevance by introducing most crypto algorithms that are used in modern real-world applications. For every crypto scheme, up-to-date security estimations and key length recommendations are given. We also discuss the important issue of software and hardware implementation for every algorithm. In addition to crypto algorithms, we introduce topics such as important cryptographic protocols, modes of operation, security services and key establishment techniques.
Indicative Contents المحتويات الإرشادية	This course introduces Cryptography technique. This course has been approved to satisfy the Comprehensive Articulation Agreement for transferability as a pre-major and/or elective course requirement. Home Works and Assignments Attendance is mandatory. Every class is important. All deadlines are hard. Under normal circumstances late work will not be accepted. Students are required to take all the tests. No make-up tests will be given under normal circumstances. Any form of cheating on exams/assignments/quizzes is subject to serious penalty Attendance 75% attendance is mandatory. Latecomers will be marked as absent. Evaluation Criteria Assignments/projects 20% Quizzes 10% Mid-Term 20% Final 50%

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	S.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem)	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5

الحمل الدراسي غير المنتظم للطلاب خلال الفصل			
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Cryptography
Week 2	Stream Ciphers
Week 3	The Data Encryption Standard (DES) and Alternatives
Week 4	The Advanced Encryption Standard (AES)
Week 5	More About Block Ciphers
Week 6	Introduction to Public-Key Cryptography
Week 7	The RSA Cryptosystem
Week 8	MID TERMS
Week 9	Public-Key Cryptosystems Based on the Discrete Logarithm Problem
Week 10	Elliptic Curve Cryptosystems
Week 11	Digital Signatures
Week 12	Hash Functions
Week 13	Message Authentication Codes (MACs)
Week 14	Key Establishment
Week 15	Preparing for final exams
Week 16	FINAL EXAMS

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر
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	Material Covered
Week 1	Stream Ciphers
Week 2	The Data Encryption Standard (DES) and Alternatives
Week 3	The Advanced Encryption Standard (AES)
Week 4	The RSA Cryptosystem
Week 5	Public-Key Cryptosystems Based on the Discrete Logarithm Problem
Week 6	Digital Signatures
Week 7	Hash Functions
Week 8	Message Authentication Codes (MACs), Key Establishment

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Paar, Christof, and Jan Pelzl. <i>Understanding cryptography: a textbook for students and practitioners</i> . Springer Science & Business Media, 2009.	Yes
Recommended Texts	Stallings, William. "Cryptography and Network Security principles and practice sixth edition." (2006).	No
Websites		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
Module Title	Artificial Intelligence		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	COM-312			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		6
Administering Department	Computer Science	College	College of Science	
Module Leader	Prof. Dr. Hassan Hadi Saleh	e-mail	Hassan.hadi@uodiyala.edu.iq	
Module Leader's Acad. Title	Professor	Module Leader's Qualification		Ph.D.
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	1-6-2025	Version Number	.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Programming fundamentals, data structures, elementary linear algebra, probability and differentiation. Official prerequisite module codes are set by the department.	Semester	
Co-requisites module	None proposed. Python revision is embedded in the opening laboratory.	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This module develops the ability to model intelligent behaviour, solve problems through search, and build and evaluate introductory machine learning and neural network models. Weekly laboratories connect the theory to reproducible Python experiments. 1. Explain the principal approaches to artificial intelligence and the role of rational agent in designing intelligent systems. 2. Develop formal problem representations and select search methods using solution quality and computational requirements. 3. Connect machine learning concepts to the construction and evaluation of simple predictive models. 4. Establish the foundations needed to understand neural network training and convolutional architectures. 5. Develop practical programming, experimental reasoning and technical communication through documented laboratory work. Module Learning Outcomes On successful completion, the student will be able to achieve the following observable outcomes. The same LO identifiers are used in the weekly plans and assessment table.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On successful completion, the student will be able to achieve the following observable outcomes. The same LO identifiers are used in the weekly plans and assessment table.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• Lectures • Tutorials • Problem solving
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- Lab
- Case study
- Small project

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome	
Formative assessment	Quizzes	2 × 30 min	10% (10)	Weeks 5, 11	LO #1, #2 and #10,	#11
	Assignments	2 assignments	10% (10)	Weeks 6, 10	LO #3, #4 and #6	#7
	Projects / Lab.	Portfolio, practical test and project demonstration	10% (10)	Weeks 1–15; test and demo in 15		All
	Report	1 project report and an individual seminar contribution	10% (10)	Week 15	LO #5, #8 and	#10
Summative assessment	Midterm Exam	2hr	10% (10)		LO #1	#7
	Final Exam	2hr	50% (50)			All
Total assessment			100% (100 Marks)			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered	
Week 1	AI foundations and scope Definitions of intelligence and AI; the four classical approaches; a short historical timeline; capabilities and limits; the relationship between AI, ML and DL. Use a small set of application examples to distinguish perception, reasoning and learning.	
Week 2	Rational agents and environments Percepts, actions, agent function and architecture; rationality and performance measures; PEAS specification; observability, uncertainty, dynamics and multiple agents; reflex, model-based, goal-based, utility-based and learning agents.	
Weeks 3	Problem formulation and state-space search	

	Initial state, actions, transition model, goal test and path cost; state versus search node; frontier and explored set; tree versus graph search. Formulate route planning, the vacuum world and the 8-puzzle. Introduce completeness, optimality, time and memory. Learning check: Write one formal problem definition and identify repeated states in its search graph.
Weeks 3	Uninformed search BFS, DFS and uniform-cost search; depth-limited and iterative-deepening search; queue, stack and priority-queue behaviour; cycle handling. Compare algorithm properties under clearly stated assumptions about finite branching, edge costs and state repetition.
Week 4	Informed search and heuristics Heuristic functions; greedy best-first search and A*; the roles of path cost and estimated remaining cost; admissibility and consistency; handling better paths to an existing state. Relate optimality to the selected graph-search implementation.
Week 5	AI foundations and scope Definitions of intelligence and AI; the four classical approaches; a short historical timeline; capabilities and limits; the relationship between AI, ML and DL. Use a small set of application examples to distinguish perception, reasoning and learning.
Weeks 6	Local search and optimisation State-space landscapes; objective functions; hill climbing, local optima and plateaus; random restarts; simulated annealing and temperature. Use N-Queens to distinguish finding a good configuration from finding a minimum-cost path. Learning check: Compare success rate and objective value across repeated runs. Submit Assignment 1.
Weeks 7	Adversarial search and games
Weeks 8	Machine learning foundations and midterm One hour of new theory: learning from experience; task, performance and experience; features and labels; supervised, unsupervised and reinforcement learning; regression versus classification. The 2-hour midterm covers Weeks 1–7. Use the tutorial and seminar for dataset examples and project framing.
Weeks 9	Supervised learning and model evaluation A simple decision-tree classifier and linear-regression baseline; training, validation and test roles; fitting preprocessing only on training data; confusion matrices, accuracy, precision, recall, F1 and mean absolute error. Introduce overfitting and model selection.
Weeks 10	Neural network foundations Artificial neurons, weights and bias; perceptron limitations; activation functions; multilayer perceptrons; forward propagation; output choices for regression and classification; loss functions and the distinction between a parameter and a hyperparameter.
Weeks 11	Training neural networks and generalisation Gradient descent, learning rate, batches and epochs; backpropagation as application of the chain rule; training versus inference; learning curves; underfitting and overfitting; weight penalties, dropout and early stopping.
Weeks 12	Convolutional neural network operations Images as tensors; local receptive fields and shared weights; filters, channels and feature maps; stride and padding; nonlinear activation; max pooling; flattening and dense layers. Calculate output dimensions and parameters for a small network.
Weeks 13	CNN training and interpretation Prepare image data; define and train a small CNN; inspect learning curves and classification errors; compare against an MLP baseline on the same split. Use feature maps and selected saliency examples to discuss what visualisation can and cannot explain.
Weeks 14	Selected CNN architectures Compare LeNet, AlexNet, VGG, Inception and residual connections through their design principles. Analyse depth, parameter counts and computational demand. Use selected worked examples rather than reproducing the entire architecture slide bank.
Week 15	Integrated AI applications and review

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Python environment and reproducible notebooks
Week 2	A simple rational agent
Week 3	State-space representation
Week 4	BFS DFS and uniform-cost search
Week 5	Greedy search and A*
Week 6	Local search on N-Queens
Week 7	Minimax and alpha-beta pruning
Week 8	Learning tasks and dataset preparation
Week 9	Supervised baseline and evaluation
Week 10	Neurons and forward propagation
Week 11	Training an MLP
Week 12	Convolution pooling and tensor shapes
Week 13	Training and evaluating a CNN
Week 14	Architecture comparison and project consolidation
Week 15	Individual practical assessment and project demonstration

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, 4th edition. Selected sections on agents, search, machine learning and deep learning. Chapter numbering differs between US and Global editions.	Yes
Recommended Texts	Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016. Chapters 6–9 for feedforward networks, regularisation, optimisation and CNNs.	No
Websites	https://aima.cs.berkeley.edu/	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria

Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

المرحلة الثالثة

الكورس الثاني.

فرع الامن

السبراني

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<u>منصات الامن السيبراني</u>		Module Delivery
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>CYB-302</u>		
ECTS Credits	<u>4</u>		
SWL (hr/sem)	<u>100</u>		
Module Level	U	Semester of Delivery	
Administering Department	com	College	os
Module Leader	Wasan Saad Ahmed	e-mail	wasan@uodiyala.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date		Version Number	

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

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

Module Objectives أهداف المادة الدراسية	- Introduce students to the concept of cybersecurity platforms and their importance in protecting digital infrastructures. - Provide students with theoretical knowledge and practical skills in SIEM, IDS/IPS, EDR, SOAR, Threat Intelligence, and Cloud Security. - Train students to use real-world tools such as Splunk, Snort, MIS P, Nessus, and AWS Security. - Enable students to design integrated cybersecurity solutions that comply with standards such as ISO 27001 and NIST.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course, students will be able to: 77. Distinguish between different types of cybersecurity platforms and their functions. 78. Apply practical skills in log collection and analysis using SIEM. 79. Write attack detection rules using IDS/IPS. 80. Assess threats using Threat Intelligence platforms. 81. Use vulnerability scanning tools and prioritize remediation. 82. Employ SOAR platforms to automate incident response. 83. Analyze the differences between on-premises and cloud-based security solutions.
Indicative Contents المحتويات الإرشادية	This course is primarily aimed at students with a technical background who wish to understand, configure, and integrate modern cybersecurity platforms. It provides both theoretical foundations and practical experience with tools such as SIEM, IDS/IPS, EDR, SOAR, Threat Intelligence, Vulnerability Management, and Cloud Security solutions. A background in computer networks and operating systems is required for the course. Students are expected to have basic knowledge of system administration and scripting to complete laboratory exercises. Those without prior exposure to network security or Linux-based systems will be required to undertake supplementary work at the beginning of the course.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The course begins by introducing the core concepts of cybersecurity platforms and their role in modern digital defense. After an overview of the main categories such as SIEM, IDS/IPS, EDR, SOAR, Threat Intelligence, and Cloud Security, the course illustrates both the potential and current limitations of these technologies with examples from real-world environments. Time will be spent on understanding the challenges of managing security operations, the trade-offs between different platform types (on-premises vs. cloud-based), and the compliance implications of deploying these solutions. Exercises will include hands-on practice with industry-standard tools, configuration of security use cases, and the integration of multiple platforms into a cohesive stack. In a final project, groups of students will design and present a practical cybersecurity platform solution for a simulated organization.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	64	Structured SWL (h/w)	4

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	2 and 7	
	Assignments	2	10% (10)	2 and 10	
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	
Summative assessment	Midterm Exam	2hr	10% (10)	7	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Cybersecurity Platforms
Week 2	Definition and purpose
Week 3	Core components (visibility, analytics, response)
Week 4	Security Information and Event Management (SIEM)
Week 5	Architecture of SIEM systems
Week 6	Log collection and normalization
Week 7	Mid-term Exam
Week 8	Intrusion Detection and Prevention Systems (IDS/IPS)
Week 9	Signature-based vs anomaly-based detection
Week 10	Tools: Snort, Suricata, Zeek
Week 11	Endpoint Detection and Response (EDR)
Week 12	EDR vs traditional antivirus
Week 13	Behavioral analysis and response workflows
Week 14	Vulnerability Management Platforms
Week 15	Continuous scanning and patch prioritization
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Linux
Week 2	Deploying Splunk or ELK for log analysis
Week 3	Writing IDS rules in Snort
Week 4	Setting up a MISP instance for threat intelligence
Week 5	Automating incident response with SOAR playbooks
Week 6	Simulating attacks and analyzing platform detection
Week 7	Deploying Wazuh

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	The Practice of Network Security Monitoring” by Richard Bejtlich	Yes
Recommended Texts	Security Operations Center: Building, Operating, and Maintaining Your SOC by Joseph Muniz	Yes
Websites	https://isip.piconepress.com/courses/temple/ece_8527/syllabus/current/	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Pattern Recognition</u>		Module Delivery	
Module Type	<u>Elective</u>		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>COM-326</u>			
ECTS Credits	<u>5</u>			
SWL (hr/sem)	<u>125</u>			
Module Level	3	Semester of Delivery		7
Administering Department	com	College	os	
Module Leader	Adil Abdulwahhab Al-Azzawi		e-mail	adil_alazzawi@uodiyala.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	E-mail
Peer Reviewer Name			e-mail	E-mail
Scientific Committee Approval Date	02/06/2025		Version Number	.0

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This course covers the techniques and gain proficiency of pattern recognition that are fundamental to a wide variety of application areas such as medical research, biometrics, computer vision, etc.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	84. Understands basic structure of pattern recognition systems. 85. Summarizes execution of a pattern recognition system. 86. Expresses principal units within a pattern recognition system. 87. Defines the relationship between pattern and feature. 88. Explains supervised and unsupervised pattern recognition approaches. 89. Analyzes the success of a feature recognition system.
Indicative Contents المحتويات الإرشادية	12. Introduction to Pattern Recognition, Feature Detection, Classification 13. Review of Probability Theory, Conditional Probability and Bayes Rule 14. Random Vectors, Expectation, Correlation, Covariance 15. Review of Linear Algebra, Linear Transformations 16. Decision Theory, ROC Curves, Likelihood Ratio Test 17. Linear and Quadratic Discriminants, Fisher Discriminant 18. Sufficient Statistics, Coping with Missing or Noisy Features 19. Template-based Recognition, Feature Extraction 20. Eigenvector and Multilinear Analysis 21. Training Methods, Maximum Likelihood and Bayesian Parameter Estimation 22. Linear Discriminant/Perceptron Learning, Optimization by Gradient Descent

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Pattern recognition theory and practice is concerned with the design, analysis, and development of methods for the classification or description of patterns, objects, signals, and processes. At the heart of this discipline is our ability to infer the statistical behavior of data from limited data sets, and to assign data to classes based on generalized notions of distances in a probabilistic space. Many commercial applications of pattern recognition exist today, including voice recognition (e.g., Amazon Alexa), fingerprint classification (e.g., MacBook Pro touch bar), and retinal scanners (e.g., your favorite cheesy sci-fi movie).
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3 and 9	
	Assignments	2	10% (10)	5 and 11	

Summative assessment	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	
	Midterm Exam	2hr	10% (10)	7	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction: An Overview of Machine Learning
Week 2	Decision Theory: Bayes Rule
Week 3	Decision Theory: Gaussian Classifiers
Week 4	Decision Theory: Generalized Gaussian Classifiers
Week 5	Parameter Estimation: Maximum Likelihood
Week 6	Parameter Estimation: The Bayesian Approach
Week 7	Mid-term Exam
Week 8	Decision Theory: Discriminant Analysis
Week 9	Parameter Estimation: The Expectation Maximization Theorem
Week 10	Parameter Estimation: Discriminative Training
Week 11	Experimental Design: Foundations of Machine Learning
Week 12	Experimental Design: Evaluation
Week 13	Statistical Significance
Week 14	Jackknifing, Bootstrapping and Combining Classifiers
Week 15	Introduction to Nonparametric Techniques
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Gaussian Distributions
Week 2	Bayesian Decision Theory
Week 3	ML and Bayesian Parameter Estimation
Week 4	Linear Discriminant Analysis
Week 5	
Week 6	Expectation Maximization (EM)
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	A. Lindholm, N. Wahlstrom, F. Lindsten and T. Schon, Machine Learning: A First Course for Engineering and Scientists, Cambridge University Press, New York, New York, USA, ISBN: 978-1-108-84360-7, pp. 338, 2022. URL: http://smlbook.org/book/sml-book-draft-latest.pdf	Yes
Recommended Texts	C.M. Bishop, Pattern Recognition and Machine Learning, Springer, ISBN: 978-0387310732, 2003.	No
Websites	https://isip.piconepress.com/courses/temple/ece_8527/syllabus/current/	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Web applications Development			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	COM-322				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		3	Semester of Delivery		
Administering Department		com	College		
Module Leader	Dheyab Salman Ibrahim		e-mail	dr.dheyab@uodiyala.edu.iq	
Module Leader's Acad. Title		Assistant Prof	Module Leader's Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-214	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Web Development course syllabus aims to teach about front-end, back-end, and full-stack Web Development. Web Development course covers various topics under Web Development such as Database Management, Web Publishing, Web Design, and Web Programming. . This is an online course. All official course materials will be made available online at https://gitlab.msu.edu/cse477-spring-2022. This course does not use desire2learn. If you can not access the course repository, please contact a member of the course staff. The contents of the course require a login using an MSU ID and password.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course provides an overview of contemporary techniques, and tools used for web application development. More specifically, this course covers the three essential technology components of web applications (frontend, backend, and databases), as well as the internet technologies used to host, distribute, and scale web applications. A list of key topics include: How the internet works, internet protocols, domain name servers, web hosting, HTML, CSS, Javascript, conventions and best practices, DOM manipulation, Python Flask, sessions, cookies, relational databases, NoSQL Databases, database optimization, containerization, version control systems, APIs and Microservices. Objective Students completing this course are expected to be able to: Understand the unique aspects of web application design. Work in resource sensitive and resolution variant environments. Apply common patterns in web development
Indicative Contents المحتويات الإرشادية	Web development is building websites and web applications like Facebook, Twitter, or internal web portals within businesses. Web development has two disciplines: front-end and back-end. Front-end is visual and interactive aspects of a website. You will learn HTML, CSS and JavaScript to master front-end web development. Back-end is all the logic behind the scenes that supports your website: databases, user management, etc. You will need to learn any one of the following back-end languages and frameworks:

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Web design is foundational material for computer science: Many areas of computer science require the ability to work with concepts from web design technologies, specifically material from such HTML, CSS, and JavaScript. The main strategy that will be adopted in delivering the Web design structures module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. The module will include a combination of classes, and interactive tutorials.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem)	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5

الحمل الدراسي غير المنتظم للطلاب خلال الفصل			
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	200		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Web Development
Week 2	HyperText Markup Language (HTML)
Week 3	JS Functions and Objects
Week 4	JavaScript and HTTP (for ns)
Week 5	Database Interaction & UI
Week 6	Mathematical Structure for Computer Science
Week 7	Front End Libraries & Frameworks
Week 8	Website Structure and Hosting
Week 9	
Week 10	exam
Week 11	
Week 12	Creating HTML Forms
Week 13	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to HTML
Week 2	Introducing Flexbox
Week 3	JavaScript for Front-end
Week 4	Syntax & Creating Concepts with JavaScript
Week 5	Design Patterns & Object Modelling
Week 6	HTTP Requests & Routes
Week 7	Intro to Build Tools
Week8	Express Framework, Building scalable web applications
Week9	OOPS
Week10	
Week11	Development Environment & Tools

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	- How the Internet Works, Preston Gralla, Pearson Education, Eighth Edition. - Internet for Everyone, Alexis Leon, S. Chand (G/L) & Company Ltd; Second Edition.	Yes
Recommended Texts	- DATA COMMUNICATIONS AND NETWORKING, Fourth Edition, Behrouz A. Forouzan - "Web Programming Step by Step" by Marty Stepp, Jessica Miller, Victoria Kirst. - A useful web site for learning more about web development - Available here: https://www.geeksforgeeks.org/web-1-0-web-2-0-and-web-3-0-with-their-difference/ - (1970) https://websitebuilders.com/how-to/glossary/web2/ - Available here: https://askanydifference.com/difference-between-web-1-0-and-web-2-0-with-table/	Yes
Websites	http://www.w3schools.com Tutorial points Simply easy learning	

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

	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	<u>Web applications Development</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>COM-322</u>				
ECTS Credits	<u>6</u>				
SWL (hr/sem)	<u>150</u>				
Module Level	3				
Administering Department		com	College	Semester of Delivery	
Module Leader	Dheyab Salman Ibrahim		e-mail	dr.dheyab@uodiyala.edu.iq	
Module Leader's Acad. Title	Assistant Prof		Module Leader's Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2025		Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-214	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Web Development course syllabus aims to teach about front-end, back-end, and full-stack Web Development. Web Development course covers various topics under Web Development such as Database Management, Web Publishing, Web Design, and Web Programming. . This is an online course. All official course materials will be made available online at https://gitlab.msu.edu/cse477-spring-2022. This course does not use desire2learn. If you can not access the course repository, please contact a member of the course staff. The contents of the course require a login using an MSU ID and password.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course provides an overview of contemporary techniques, and tools used for web application development. More specifically, this course covers the three essential technology components of web applications (frontend, backend, and databases), as well as the internet technologies used to host, distribute, and scale web applications. A list of key topics include: How the internet works, internet protocols, domain name servers, web hosting, HTML, CSS, Javascript, conventions and best practices, DOM manipulation, Python Flask, sessions, cookies, relational databases, NoSQL Databases, database optimization, containerization, version control systems, APIs and Microservices. Objective Students completing this course are expected to be able to: Understand the unique aspects of web application design. Work in resource sensitive and resolution variant environments. Apply common patterns in web development
Indicative Contents المحتويات الإرشادية	Web development is building websites and web applications like Facebook, Twitter, or internal web portals within businesses. Web development has two disciplines: front-end and back-end. Front-end is visual and interactive aspects of a website. You will learn HTML, CSS and JavaScript to master front-end web development. Back-end is all the logic behind the scenes that supports your website: databases, user management, etc. You will need to learn any one of the following back-end languages and frameworks:

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

Web design is foundational material for computer science: Many areas of computer science require the ability to work with concepts from web design technologies, specifically material from such HTML, CSS, and JavaScript.

The main strategy that will be adopted in delivering the Web design structures module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. The module will include a combination of classes, and interactive tutorials.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Web Development
Week 2	HyperText
Week 3	JS Functions and Objects

Week 4	JavaScript and HTTP (forms)
Week 5	Database Interaction & UI
Week 6	Mathematical Structure for Computer Science
Week 7	Front End Libraries & Frameworks
Week 8	Website Structure and Hosting
Week 9	
Week 10	exam
Week 11	
Week 12	Creating HTML Forms
Week 13	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to HTML
Week 2	Introducing Flexbox
Week 3	JavaScript for Front-end
Week 4	Syntax & Creating Concepts with JavaScript
Week 5	Design Patterns & Object Modelling
Week 6	HTTP Requests & Routes
Week 7	Intro to Build Tools
Week8	Express Framework, Building scalable web applications
Week9	OOPS
Week10	
Week11	Development Environment & Tools

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	- -How the Internet Works, Preston Gralla, Pearson Education, Eighth Edition. -Internet for Everyone, Alexis Leon, S. Chand (G/L) & Company Ltd; Second Edition.	Yes
Recommended Texts	- -DATA COMMUNICATIONS AND NETWORKING, Fourth Edition, Behrouz A. Forouzan	Yes

	- “Web Programming Step by Step” by Marty Stepp, Jessica Miller, Victoria Kirst. - A useful web site for learning more about web development - Available here: https://www.geeksforgeeks.org/web-1-0-web-2-0-and-web-3-0-with-their-difference/ - (1970) https://websitebuilders.com/how-to/glossary/web2/ - Available here: https://askanydifference.com/difference-between-web-1-0-and-web-2-0-with-table/	
Websites	http://www.w3schools.com Tutorial points Simply easy learning	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Computer Networks		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar		
Module Code	COM-322				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level			Semester of Delivery		1
Administering Department		COM	College	Type College Code	

Module Leader		e-mail	dr.dheyab@uodiyala.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	1-6-2026	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	90. The aim of this module is to describe structures, procedures, protocols and principles of computer networks. 91. This course aims to study main principals of Communication system. 92. To teach the fundamentals of computer networks. 93. To teach the Network and Communication. 94. To teach the basics of Data Representation. 95. To teach the basics of fata flow technologies. 96. To teach the basics of Network devices, 97. To teach the basics of Transmission Medium. 98. To teach the basics of Network Topology. 99. To teach the basics of Signals and Data Transmission. 100.To teach the basics of Throughput and Bandwidth. 101.To teach the basics of Network Hardware. 102.To teach the basics of Network Software. 103.To teach the basics of Protocols and Standards. 104.To teach the basics of OSI and TCP/IP Models. 105.To teach the basics of Addressing. 106.To teach the basics of IPv4 Address and Internet Protocol version 6 (IPv6).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 65. To understand the fundamental of communication. 66. To understand the basic of computer networks.

	67. To understand the basic of Network Topology. 68. To understand the basic of Network devices. 69. To understand the basic of OSI and TCP/IP Models 70. To understand the basic of the technology and protocols underlying the computer networks. 71. To understand the basic of addressing. 72. To understand the basic of IPv4 and IPv6. 73. To understand the basic of Multiplexing.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Assignment 1 will incorporate the computer networks: Assignment 2 will look toward the development computer networks with IP addresses: Formative assessment will be carried out through laboratory exercises, making use of relevant tasks and scenarios. 1. Computer networks and data communication • Define a data communication system. • List the components of data communication system. • Define a computer networks. • List the types of a computer networks. 2. Network Topologies. 3. Network devices. 4. Network Protocols 5. Network Addressing

Learning and Teaching Strategies			
استراتيجيات التعلم والتعليم			
Strategies	Computer Networks is foundational material for computer science: Many areas of computer science require the ability to work with concepts from computer network technologies, specifically material from such OSI model, TCP/IP model, and Addressing. The main strategy that will be adopted in delivering the IPv4 structures module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. The module will include:		
	• Lectures • Lab • Small project		
Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Data Communication and Networking
Week 2	Network devices
Weeks 3	Transmission Medium
Weeks 4	Network Topology
Week 5	Signals and Data Transmission
Week 6	Throughput and Bandwidth
Weeks 7	Network Hardware
Weeks 8	Midterm Exam 1
Weeks 9	Network Software
Weeks 10	Protocols and Standards
Weeks 11	OSI and TCP/IP Models
Weeks 12	Addressing
Weeks 13	IPv4 and IPv6 addresses.
Weeks 14	Midterm Exam 2
Weeks 15	Preparatory week before the final Exam

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Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	Computer Networks Types
Week 2	Computer Networks Topologies
Week 3	Computer Networks Devices
Week 4	MAC addresses
Week 5	Logical Addresses: IPv4
Week 6	Port addresses
Week 7	Addressing
Week 8	Establish communication among computers in the network using various network hardware components.
Week 9	Identification and implement the various protocols for establishing the network using simulation tools like Packet Tracer.
Week 10	Simulating various network topologies, designing and implementation of various routing techniques
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Computer Networks Fifth Edition Andrews.Tanenbaum	Yes
Recommended Texts	Data Communication and Networking by Behrouz	yes
Websites	https://www.google.com/search?q=Computer+networks%2Bbahroz&rlz=1C1GCEA_enIQ1204IQ1204&oq=Computer+networks%2Bbahroz&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIHCAEQIRigATIHCAIQIRigATIHCAEQIRiPAjIHCAQQIRiPAjIBCTIzOTEzajBqOagCALACAQ&sourceid=chrome&source=chrome.ob&ie=UTF-8	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Software Applications in Cyber security			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	CYB-324				
ECTS Credits	3.00				
SWL (hr/sem)	75				
Module Level		1th3rd	Semester of Delivery		6
Administering Department		COMPUTER	College	Science	
Module Leader	Muna Rashid Hameed		e-mail	munarashid@uodiyala.edu.iq	
Module Leader’s Acad. Title		Lecturer Assistant	Module Leader’s Qualification		Msc
Module Tutor	Muna Rashid Hameed		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		1-6-2025	Version Number	.0	

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	• Provide practical, hands-on experience with essential cybersecurity software tools used for monitoring, scanning, and penetration testing. • Enable students to build and manage security environments using dedicated operating systems like Kali Linux and virtualization platforms (VirtualBox).

	• Develop core technical skills in network traffic analysis, vulnerability assessment, and web application security testing. • Introduce foundational concepts in digital forensics, malware analysis, and data encryption techniques through practical applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Knowledge & Understanding: Identify key categories of cybersecurity software, understand common vulnerability types, and explain the principles of encryption and digital investigation. • Practical & Technical Skills: Capture and analyze network packets, execute vulnerability scans, run ethical penetration testing simulations, and recover digital evidence. • Problem-Solving & Application: Interpret security scan reports, configure protective antivirus measures, and apply tools to secure vulnerable applications.
Indicative Contents المحتويات الإرشادية	• Security OS & Virtualization: Kali Linux, Windows Security, and VirtualBox sandboxing. • Network Analysis & Scanning: Packet sniffing with Wireshark and Nmap port discovery. • Vulnerability Assessment & PenTesting: OpenVAS/Nessus scanning and Metasploit fundamentals. • Malware & Cryptography: Malware detection, password cracking, and VeraCrypt/GPG encryption. • Web Security & Forensics: OWASP ZAP scanning, OWASP Top 10, and Autopsy/FTK digital forensics.

Learning and Teaching Strategies				
استراتيجيات التعلم والتعليم				
Strategies	• Lectures • Tutorials • Problem solving • Lab • Case study • Small project			
	Student Workload (SWL)			
	الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
	Structured SWL (h/sem)		Structured SWL (h/w)	
	الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
	Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا		
Total SWL (h/sem)	100			
الحمل الدراسي الكلي للطالب خلال الفصل				

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Cybersecurity Software
Week 2	Operating Systems & Virtualization for Cybersecurity
Weeks 3	Network Protocols & Traffic Fundamentals
Weeks 3	Network Analysis & Packet Sniffing
Week 4	Network Discovery & Reconnaissance
Week 5	Vulnerability Assessment & Management
Weeks 6	Midterm Examination
Weeks 7	Ethical Hacking & Penetration Testing Fundamentals
Weeks 8	Malware Types & Detection Systems
Weeks 9	Cryptography Concepts & Password Security
Weeks 10	Web Application Security & OWASP Top 10
Weeks 11	Web Security Scanning & Analysis Tools
Weeks 12	Digital Forensics & Incident Investigation
Weeks 13	Log Analysis & Security Monitoring Systems
Weeks 14	System Hardening & Security Best Practices
Week 15	Introduction to Cybersecurity Software

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material covered
Week 1	Environment Setup and Basic Security Tools Installation
Week 2	Installing Kali Linux and Configuring VirtualBox Sandbox
Week 3	Capturing and Analyzing Network Traffic with Wireshark

Week 4	Network Scanning and Port Discovery Using Nmap
Week 5	Advanced Network Reconnaissance and Service Enumeration
Week 6	Conducting Automated Vulnerability Scans with OpenVAS / Nessus
Week 7	Midterm Practical Examination / Lab Assessment
Week 8	Basic Penetration Testing Simulation using Metasploit
Week 9	Malware Scanning and System Cleanup using ClamAV and Malwarebytes
Week 10	Password Hashing Analysis and Encryption with VeraCrypt & GPG
Week 11	Web Application Vulnerability Testing and Input Validation
Week 12	Automated Web Security Scanning with OWASP ZAP
Week 13	Digital Forensics and Evidence Recovery with Autopsy / FTK Imager
Week 14	Analyzing System Logs and Monitoring Security Events
Week 15	Comprehensive Lab Project and Final Practical Assessment

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Cybersecurity Essentials, Charles J. Brooks, Christopher Grow, Philip A. Craig Jr., Donald Short, Sybex / Wiley, ISBN: 978-1119362395.	Yes
Recommended Texts	Computer Security: Principles and Practice, William Stallings & Lawrie Brown, Pearson, ISBN: 978-0134794105.	No

Websites	1. TryHackMe (Hands-on Labs): https://tryhackme.com 2. Hack The Box Academy: https://academy.hackthebox.com 3. Wireshark Official Documentation: https://www.wireshark.org/docs 4. Nmap Network Scanning Guide: https://nmap.org/book 5. OWASP ZAP Documentation: https://www.zaproxy.org/docs 6. Cisco Networking Academy: https://www.netacad.com
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Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Digital Signal Processing</u>			Module Delivery
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>COM-327</u>			
ECTS Credits	<u>6</u>			
SWL (hr/sem)	<u>150</u>			
Module Level	Undergraduate	Semester of Delivery	6	
Administering Department	Computer Science	College	Engineering	
Module Leader	Yahia Mohammed Hussain		e-mail	yahia@uodiyala.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	E-mail
Peer Reviewer Name			e-mail	E-mail
Scientific Committee Approval Date	02/09/2025		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Specific outcomes of instruction (The student will be able to): 1-Understand basic discrete-time systems, linearity, linear time-invariance, Stability, impulse response, and discrete convolution. 2-Implement discrete time systems, recursive and non-recurse realizations. 3-Perform Z transform and finding the inverse Z transform including its properties. 4- Understand frequency analysis of both continuous and discrete signals. 5-Understand frequency response of linear time invariant (LTI) systems. 6-Understand discrete Fourier transform, its properties, and applications. 7-Design digital filters both FIR, IIR filters. 8-Understand of multi-rate signal processing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	107. Identify problems where DSP techniques are applicable. 108. Apply selected basic DSP techniques, judge applicability of more advance techniques. 109. Participate in the design of systems and filters and learn from experience.
Indicative Contents المحتويات الإرشادية	This course is primarily aimed at students with technical backgrounds who wish to design and develop products and services using DSP. A background in basic systems and signals is required for the course. Students need at least a basic knowledge of know the types of systems and signals to complete the assignments for this course. Students who have not taken the principle of signals and systems have equivalent background will be required to complete supplementary work to learn signals and systems at the beginning of the course.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The course begins by describing what the types of systems and signals, Discrete-time signals and systems techniques can do. After an introduction to some basic concepts and techniques, the course illustrates both the potential and current limitations of these techniques with examples from a variety of applications. We spend some time on understanding the z-transform, inverse z-transform, and the Z-transform properties. Exercises will include hands-on application of basic DSP techniques as well as selection of appropriate technologies for a given problem and anticipation of design implications. Then the student will learn how and where use the discrete Fourier series and discrete Fourier transform. And the student will able to design a digital filter structures In a final project, groups of students will participate in the creation of an DSP-based application

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	2 and 7	
	Assignments	2	10% (10)	2 and 10	
	Projects / Lab.	-	-	-	
	Report	1	10% (10)	13	
Summative assessment	Midterm Exam	2hr	20% (20)	7	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to discrete linear systems, Discrete time signals.
Week 2	Shift invariance, Stability and causality
Week 3	Impulse response, Difference equations
Week 4	Discrete-Time Fourier Transform
Week 5	Linear Time Invariant Systems
Week 6	Frequency response of linear time invariant systems
Week 7	Mid-term Exam
Week 8	Convolution and correlation
Week 9	Z-transforms
Week 10	Definition of DFT and relation to Z-transform.
Week 11	Digital filter design
Week 12	Digital Butterworth filters
Week 13	Design of FIR digital filters
Week 14	Structures and properties of FIR and IIR filters,

Week 15	Computation of the discrete Fourier transform
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Discrete-Time Signal Processing by A. V. Oppenheim and R. W. Schaffer, with M. T. Yoder and W. T. Padgett (PrenticeHall/Pearson, 2009, ISBN: 978-0131988422)	Yes
Recommended Texts	Digital Signal Processing: A Computer-Based Approach, S. K. Mitra, McGraw-Hill,	Yes
Recommended books and references (scientific journals, reports...)	Schaum's Outline of Digital Signal Processing, M. Hays, McGraw-Hill, 1999: This complements Mitra with lots of worked examples and summaries of each topic as well as a large number of additional problems.	

Grading Scheme

مخطط الدرجات

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

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

المرحلة الثالثة

الكورس الأول

فرع

المعلومات الطبية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
Module Title	Artificial Intelligence		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	COM-312			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	3	Semester of Delivery		6
Administering Department	Computer Science	College	College of Science	
Module Leader	Prof. Dr. Hassan Hadi Saleh		e-mail	Hassan.hadi@uodiyala.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	1-6-2025	Version Number	.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Programming fundamentals, data structures, elementary linear algebra, probability and differentiation. Official prerequisite module codes are set by the department.	Semester	
Co-requisites module	None proposed. Python revision is embedded in the opening laboratory.	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This module develops the ability to model intelligent behaviour, solve problems through search, and build and evaluate introductory machine learning and neural network models. Weekly laboratories connect the theory to reproducible Python experiments. 1. Explain the principal approaches to artificial intelligence and the role of rational agents in designing intelligent systems. 2. Develop formal problem representations and select search methods using solution quality and computational requirements. 3. Connect machine learning concepts to the construction and evaluation of simple predictive models. 4. Establish the foundations needed to understand neural network training and convolutional architectures. 5. Develop practical programming, experimental reasoning and technical communication through documented laboratory work. Module Learning Outcomes On successful completion, the student will be able to achieve the following observable outcomes. The same LO identifiers are used in the weekly plans and assessment table.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On successful completion, the student will be able to achieve the following observable outcomes. The same LO identifiers are used in the weekly plans and assessment table.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• Lectures • Tutorials • Problem solving
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- Lab
- Case study
- Small project

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome	
Formative assessment	Quizzes	2 × 30 min	10% (10)	Weeks 5, 11	LO #1, #2 and #10,	#11
	Assignments	2 assignments	10% (10)	Weeks 6, 10	LO #3, #4 and #6	#7
	Projects / Lab.	Portfolio, practical test and project demonstration	10% (10)	Weeks 1–15; test and demo in 15		All
	Report	1 project report and an individual seminar contribution	10% (10)	Week 15	LO #5, #8 and	#10
Summative assessment	Midterm Exam	2hr	10% (10)		LO #1	#7
	Final Exam	2hr	50% (50)			All
Total assessment			100% (100 Marks)			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered	
Week 1	AI foundations and scope Definitions of intelligence and AI; the four classical approaches; a short historical timeline; capabilities and limits; the relationship between AI, ML and DL. Use a small set of application examples to distinguish perception, reasoning and learning.	
Week 2	Rational agents and environments Percepts, actions, agent function and architecture; rationality and performance measures; PEAS specification; observability, uncertainty, dynamics and multiple agents; reflex, model-based, goal-based, utility-based and learning agents.	
Weeks 3	Problem formulation and state-space search	

	Initial state, actions, transition model, goal test and path cost; state versus search node; frontier and explored set; tree versus graph search. Formulate route planning, the vacuum world and the 8-puzzle. Introduce completeness, optimality, time and memory. Learning check: Write one formal problem definition and identify repeated states in its search graph.
Weeks 3	Uninformed search BFS, DFS and uniform-cost search; depth-limited and iterative-deepening search; queue, stack and priority-queue behaviour; cycle handling. Compare algorithm properties under clearly stated assumptions about finite branching, edge costs and state repetition.
Week 4	Informed search and heuristics Heuristic functions; greedy best-first search and A*; the roles of path cost and estimated remaining cost; admissibility and consistency; handling better paths to an existing state. Relate optimality to the selected graph-search implementation.
Week 5	AI foundations and scope Definitions of intelligence and AI; the four classical approaches; a short historical timeline; capabilities and limits; the relationship between AI, ML and DL. Use a small set of application examples to distinguish perception, reasoning and learning.
Weeks 6	Local search and optimisation State-space landscapes; objective functions; hill climbing, local optima and plateaus; random restarts; simulated annealing and temperature. Use N-Queens to distinguish finding a good configuration from finding a minimum-cost path. Learning check: Compare success rate and objective value across repeated runs. Submit Assignment 1.
Weeks 7	Adversarial search and games
Weeks 8	Machine learning foundations and midterm One hour of new theory: learning from experience; task, performance and experience; features and labels; supervised, unsupervised and reinforcement learning; regression versus classification. The 2-hour midterm covers Weeks 1–7. Use the tutorial and seminar for dataset examples and project framing.
Weeks 9	Supervised learning and model evaluation A simple decision-tree classifier and linear-regression baseline; training, validation and test roles; fitting preprocessing only on training data; confusion matrices, accuracy, precision, recall, F1 and mean absolute error. Introduce overfitting and model selection.
Weeks 10	Neural network foundations Artificial neurons, weights and bias; perceptron limitations; activation functions; multilayer perceptrons; forward propagation; output choices for regression and classification; loss functions and the distinction between a parameter and a hyperparameter.
Weeks 11	Training neural networks and generalisation Gradient descent, learning rate, batches and epochs; backpropagation as application of the chain rule; training versus inference; learning curves; underfitting and overfitting; weight penalties, dropout and early stopping.
Weeks 12	Convolutional neural network operations Images as tensors; local receptive fields and shared weights; filters, channels and feature maps; stride and padding; nonlinear activation; max pooling; flattening and dense layers. Calculate output dimensions and parameters for a small network.
Weeks 13	CNN training and interpretation Prepare image data; define and train a small CNN; inspect learning curves and classification errors; compare against an MLP baseline on the same split. Use feature maps and selected saliency examples to discuss what visualisation can and cannot explain.
Weeks 14	Selected CNN architectures Compare LeNet, AlexNet, VGG, Inception and residual connections through their design principles. Analyse depth, parameter counts and computational demand. Use selected worked examples rather than reproducing the entire architecture slide bank.
Week 15	Integrated AI applications and review

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Python environment and reproducible notebooks
Week 2	A simple rational agent
Week 3	State-space representation
Week 4	BFS DFS and uniform-cost search
Week 5	Greedy search and A*
Week 6	Local search on N-Queens
Week 7	Minimax and alpha-beta pruning
Week 8	Learning tasks and dataset preparation
Week 9	Supervised baseline and evaluation
Week 10	Neurons and forward propagation
Week 11	Training an MLP
Week 12	Convolution pooling and tensor shapes
Week 13	Training and evaluating a CNN
Week 14	Architecture comparison and project consolidation
Week 15	Individual practical assessment and project demonstration

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, 4th edition. Selected sections on agents, search, machine learning and deep learning. Chapter numbering differs between US and Global editions.	Yes
Recommended Texts	Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016. Chapters 6–9 for feedforward networks, regularisation, optimisation and CNNs.	No
Websites	https://aima.cs.berkeley.edu/	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria

Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	<u>Medical Informatics Technology</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>MED-312</u>				
ECTS Credits	<u>100</u>				
SWL (hr/sem)	<u>4</u>				
Module Level	<u>3</u>		Semester of Delivery		
Administering Department	computer	College	science		
Module Leader	Wasan Ahmed Ali		e-mail	Wasanahmed@uodiyala.edu.iq	
Module Leader's Acad. Title	M.sc.		Module Leader's Qualification	Master	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2025		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Understand the fundamentals of medical informatics and its role in healthcare. 2. Apply technology to manage, store, and process health data efficiently. 3. Analyze health data to support clinical and administrative decision-making. 4. Develop skills in using healthcare information systems and medical software. 5. Follow standards and ethical guidelines for health data privacy and security. 6. Promote research and innovative solutions to improve healthcare quality.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate understanding of the fundamentals of medical informatics. 2. Explain the role of information technology in modern healthcare systems. 3. Identify different types of health information systems and their applications. 4. Apply basic data management techniques for clinical and administrative data. 5. Use electronic health records (EHR) systems effectively. 6. Analyze health data to support clinical decision-making. 7. Evaluate the quality and reliability of healthcare information sources. 8. Demonstrate skills in medical software and laboratory information systems. 9. Understand standards for interoperability and data exchange in healthcare. 10. Apply principles of data privacy, confidentiality, and cybersecurity in medical IT.
Indicative Contents المحتويات الإرشادية	This module will cover the theoretical knowledge and practical skills required to understand Contents for Medical Informatics. the main topics or subjects that a student will study during the module, including: 1. Introduction to Medical Informatics: Understanding the role of technology in improving healthcare. 2. Healthcare Information Systems (HIS): Learning about hospital, laboratory, and radiology management systems. 3. Electronic Health Records (EHR/EMR): Using digital records to store and manage patient data. 4. Medical Databases and Data Management: Organizing and classifying health data effectively. 5. Health Data Analysis and Decision Support Systems: Using information to make better clinical decisions. 6. Telemedicine and e-Health: Monitoring and consulting patients online. 7. Standards and Interoperability: Ensuring systems can exchange and integrate data correctly. 8. Medical Informatics Applications: Improving hospital management and health research. 9. Ethical and Legal Issues: Protecting data privacy and complying with regulations.

10. **Future Trends:** Applying AI and big data to enhance healthcare quality.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- **Lectures**
Deliver core theoretical knowledge about medical informatics concepts, systems, and applications.
- **Laboratory Sessions / Practical Workshops**
Hands-on experience with healthcare information systems (HIS), electronic health records (EHR), and medical software tools.
- **Case Studies**
Analysis of real-world healthcare scenarios to apply informatics solutions and problem-solving.
- **Group Work / Team Projects**
Collaborative assignments to design, evaluate, or implement small-scale health IT projects.
- **Tutorials / Discussion Sessions**
Guided discussions to clarify concepts, interpret standards, and explore ethical/legal issues in healthcare IT.
- **Self-directed Learning**
Encourages students to study independently using textbooks, online resources, and research articles.
- **Simulations / Virtual Labs**
Using simulated hospital systems or software to practice clinical decision support, data entry, and analysis.
- **Presentations and Reports**
Students prepare and present assignments or project findings to develop communication and critical thinking skills.
- **Assessments for Learning**
Quizzes, tests, assignments, and practical exams to reinforce learning outcomes.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered semester 1:
Week 1	Introduction to Medical Informatics
Week 2	Health Information Systems (HIS)
Week 3	Electronic Health Records (EHR)
Week 4	Clinical Decision Support Systems (CDSS)
Week 5	Clinical Decision Support Systems (CDSS)
Week 6	Health Data Standards and Interoperability
Week 7	Medical Databases and Health Data Analytics
Week 8	Privacy, Security, and Ethics in Medical Informatics
Week 9	Artificial Intelligence and Emerging Technologies in Healthcare
Week 10	Case Studies and Future Trends
Week 11	
Week 12	

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

Learning and Teaching Resources

مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	***"Medical Informatics: Practical Guide"*** by Robert Hoyt	Yes
Recommended Texts	Health Informatics: An Interprofessional Approach*** by Nelson & Staggers	yes
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Electronic Patient Records (EPR)		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	MED-313			
ECTS Credits	5			
SWL (hr/sem)	100			
Module Level		Undergraduate	Semester of Delivery	1

Administering Department	COM	College	Cos
Module Leader	:Samah Jalil Sabea Name	e-mail	E-mail samah.j.saba@gmail.com
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	1-5-2025	Version Number	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Students will explore and become more familiar with:
	This module aims to: 1. Introduce the concept, architecture, and significance of Electronic Patient Records (EPR) in modern healthcare systems. 2. Explore the benefits, challenges, and ethical implications of implementing and managing EPR systems. 3. Equip students with knowledge of data standards, interoperability, and regulatory compliance in the context of EPR. 4. Develop critical awareness of user-centered design and usability issues in EPR systems for various stakeholders. 5. Provide practical insights into the planning, deployment, and evaluation of EPR systems in clinical environments.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Explain the key components, functions, and types of Electronic Patient Records. 2- Evaluate the clinical, administrative, and legal benefits and risks associated with EPR implementation. 3- Critically assess issues related to privacy, data protection, and ethical concerns in EPR use.

	4- Analyses the impact of EPR systems on healthcare delivery, patient safety, and clinical workflows. 5- Design or critique basic EPR system components with a focus on usability and user experience. 8.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- Introduction to EPR 2- EPR Components and Systems 3- Implementation and Change Management 4- Usability and User Experience 5- Impact on Healthcare Delivery 6- Future Trends

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The class will "meet" the equivalent of two, two-hour for lecture/discussion, and practical sessions each week. The lectures and discussions will be a combination of synchronous and asynchronous discussions using WebCT. Students must have access to the Internet to facilitate demonstrating and using software. Many of the assignments should stress hands-on applications by the students. Each student will be expected to participate in all lectures. Class participation by all is expected.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	66	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	34	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11

Formative assessment	Assignments	2	10% (10)	and 124	LO #3, #4 and #6	#7
	Projects / Lab.	1	10% (10)	Continuous		All
	Report	1	10% (10)	13	LO #5, #8 and	#10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1	#7
	Final Exam	3hr	50% (50)	16		All
Total assessment			100% (100 Marks)			

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Electronic Patient Records
Week 2	Components and Structure of EPR Systems
Week 3	EPR Systems in Clinical Practice
Week 4	Standards and Interoperability
Week 5	Data Entry
Week 6	Data Accuracy, and Quality
Week 7	mid exam
Week 8	Legal Aspects of EPR
Week 9	Ethical Aspects of EPR
Week 10	Clinical Decision Support and EPR
Week 11	Implementation, Training, and Challenges
Week 12	Implementation, Training, and Challenges
Week 13	Implementation, Training, and Challenges
Week 14	Future Trends in Electronic Health Records
Week 15	Future Trends in Electronic Health Records

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to the course and practical components. Overview of Electronic Patient Record (EPR) systems, interfaces, and objectives.
Week 2	Demonstration of real EPR software (e.g., OpenEMR). Hands-on training: installation and login.
Week 3	Creating user accounts (physician, nurse, admin staff). Understanding user roles and permissions.
Week 4	Entering patient demographic data.

	Ensuring data accuracy and completeness.
Week 5	Creating electronic medical records for patients. Adding medical history and basic examinations.
Week 6	Entering laboratory and diagnostic test results. Linking test results to patient records
Week 7	Exam
Week 8	Electronic prescription entry. Training on drug dispensing and pharmacy modules.
Week 9	Recording clinical progress notes. Documenting follow-up visits.
Week 10	Managing patient appointments and scheduling. Linking appointments to patient records.
Week 11	Generating medical and statistical reports. Extracting patient reports by age, gender, or diagnosis.
Week 12	Applying privacy and data protection standards. Hands-on training in user access control and data encryption.
Week 13	Simulating integration with external systems (laboratory or pharmacy). Training on interoperability with healthcare information systems.
Week 14	Mini-project: creating a complete patient file (simulation). From registration to follow-up documentation.
Week 15	Final review and practical assessment. Discussion of challenges and student-proposed solutions.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Textbooks	- "Electronic Health Records: Understanding and Using Computerized Medical Records" by Richard Garte - "Health Informatics: An Interprofessional Approach" by Nelson & Stagers	Yes
Essential References Materials	- WHO and HIMSS guidelines on electronic health records -Open-source EHR platforms (e.g., OpenMRS, GNU Health) for demos and practice	
Electronic Materials		Electronic Materials

Grading Scheme

مخطط الدرجات

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

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Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Digital Image Processing</u>		Module Delivery	
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>COM-314</u>			
ECTS Credits	<u>6</u>			
SWL (hr/sem)	<u>150</u>			
Module Level	3	Semester of Delivery		
Administering Department	com	College	os	
Module Leader	Abdulbasit Kadhim Shukur		e-mail	dr.abdulbasit@uodiyala.edu.iq
Module Leader's Acad. Title	Ast.Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2025		Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COM-222	Semester	4
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	21. To develop Image processing skills and understanding of circuit theory through the application of techniques. 22. To understand analog Image, digital image and mathematical model of one- and two-dimensional signal (image). 23. This course deals with the basic concept of image equalization, sampling and quantization. 24. To understand image enhancement, image degradation and image compression. 25. To understand mathematical and logical concepts of image. 26. To understand convolution and filtering in image processing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 110. Recognize how the image equalization process works. 111. Image sampling and quantization. 112. Summarize what is meant by spatial and frequency domain. 113. Discuss image enhancement and image restoration process. 114. Describe lineal interpolation, bilinear interpolation. 115. Define the adjacency in image processing. 116. Identify the basic arithmetic operation in image. 117. Identify the basic logic operation in image. 118. Discuss zero order hold and first order hold in image analysis 119. Discuss the operations of convolution in image processing. 120. Discuss the concepts of filters in image processing. 121. Edge detection filters and smoothing filters. 122. Image histogram 123. Image histogram equalization 124. Image compression 125. Lose and lose less methods in image compression
Indicative Contents المحتويات الإرشادية	26. Introduction to Digital Image Processing: • Overview of image processing and its applications. • Fundamental concepts and components of digital image processing system. • Image representation and visualization. 27. Image Enhancement: • Point processing techniques, such as histogram equalization and contrast stretching. • Spatial domain methods, including spatial filtering and image sharpening. • Frequency domain methods, such as Fourier transform and filtering in the frequency domain. 28. Image Restoration: • Noise models and noise removal techniques. • Image deblurring and restoration algorithms. • Image reconstruction from projections. 29. Color Image Processing: • Color models and color spaces.

	• Color transformation and manipulation. • Color image enhancement and restoration. 30. Image Compression: • Image compression techniques, including lossless and lossy compression. • Transform coding and predictive coding. • Image compression standards, such as JPEG and JPEG2000. 31. Morphological Image Processing: • Morphological operations, such as erosion, dilation, opening, and closing. • Structuring elements and their role in morphological operations. • Morphological image analysis and feature extraction. 32. Image Segmentation: • Image segmentation techniques, including thresholding, region-based segmentation, and edge detection. • Clustering algorithms for image segmentation. • Watershed segmentation and its applications. 33. Image Representation and Description: • Image representation using boundary and region descriptors. • Texture analysis and texture descriptors. • Object recognition and image classification. 34. Image Filtering and Restoration: • Image filtering techniques, including linear and nonlinear filters. • Adaptive and spatially variant filters. • Restoration techniques for removing blur, noise, and other distortions. 35. Image Analysis and Computer Vision: • Image analysis techniques, including object detection, tracking, and motion estimation. • Pattern recognition and machine learning in image processing. • Applications of image processing in computer vision.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering the image processing module is to engage students actively in practical exercises to enhance their understanding and develop their critical thinking skills. The module will include a combination of classes, interactive tutorials, and hands-on experiments focused on sampling activities that capture students' interest. Through interactive classes, students will be introduced to the theoretical foundations of image processing, including key concepts, techniques, and algorithms. The classes will provide a solid understanding of topics such as image enhancement, image restoration, image segmentation, and image analysis. To reinforce learning and encourage active participation, interactive tutorials will be conducted. These tutorials will involve hands-on exercises where students will work with real-world images and apply different image processing techniques. This practical approach will help students grasp the practical implications of the theoretical concepts discussed in the classes. In addition to tutorials, simple experiments will be introduced to provide students with opportunities to explore various sampling activities. These experiments will focus on real-life scenarios and problems related to image processing. Students will

be encouraged to think critically, analyze the results, and propose solutions based on their understanding of the concepts learned.

The module will also emphasize the importance of collaboration and teamwork. Students will be encouraged to work together on projects and assignments, fostering a collaborative learning environment where they can exchange ideas and learn from each other's perspectives.

Overall, the module's delivery approach aims to actively engage students, refine their critical thinking skills, and provide them with practical experiences in image processing. By combining theoretical knowledge with hands-on activities, students will develop a deeper understanding of image processing concepts and their applications in various fields.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – image processing and its applications

Week 2	Computer vision and image processing
Week 3	image equalization
Week 4	Sampling and quantization
Week 5	Image enhancement, regression techniques
Week 6	Image interpolation
Week 7	Mid-term Exam
Week 8	Image analysis
Week 9	Image zooming, shrinking techniques
Week 10	Image histogram
Week 11	Histogram equalization
Week 12	Convolution
Week 13	Filtering
Week 14	Compression
Week 15	Loss and lossless methods in image compression
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: read image in MATLAB environment
Week 2	Lab 2: digital binary representation
Week 3	Lab 3: gray scale image transformation
Week 4	Lab 4: perform mathematical operation in image processing
Week 5	Lab 5: apply convolution in image processing
Week 6	Lab 6: apply filtering process
Week 7	Lab 7: Filters

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Digital Image Processing" by Rafael C. Gonzalez and Richard E. Woods "Digital Image Processing: An Algorithmic Introduction Using Java" by Wilhelm Burger and Mark J. Burge "Image Processing, Analysis, and Machine Vision" by Milan Sonka, Vaclav Hlavac, and Roger Boyle	Yes
Recommended Texts	"Digital Image Processing" by Rafael C. Gonzalez and Richard E. Woods	No
Websites		

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

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية						
Module Title	<u>Research Methodology</u>		Module Delivery			
Module Type			☒ Theory ☒ Lecture ☐ Lab ☐ L Tutorial ☐ Practical ☐ Seminar			
Module Code	<u>COM-316</u>					
ECTS Credits	<u>2</u>					
SWL (hr/sem)	<u>50</u>					
Module Level	UGI	Semester (s) offered		1		
Administering Department	Department of Computer Science	College	College of Science			
Module Leader	Qusay Kanaan Kadhim		e-mail	dr.qusay.kanaan@uodiyala.edu.q		
Module Leader's Acad. Title	Asst. Prof. Dr.		Module Leader's Qualification	Ph. D.		
Module Tutor			e-mail			
Peer Reviewer Name			e-mail			

Scientific Committee Approval Date	1/9/2025	Version Number	2.0
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Relation with Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes, Indicative Contents and Brief Description أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر			
Module Aims أهداف المادة الدراسية	7. This course aims to introduce students to the fundamentals and concepts of scientific research. 8. It will enable students to select appropriate research methods for addressing academic problems. 9. Students will learn how to formulate research questions, hypotheses, and data collection tools.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	9. Understanding different scientific research methodologies (qualitative, quantitative, experimental). 10. Ability to formulate a research problem and develop hypotheses. 11. Preparing data collection tools and analyzing the data. 12. Writing a comprehensive research report according to academic standards.		
Indicative Contents المحتويات الإرشادية	This course covers the fundamentals of scientific research and its various types, equipping students to identify research problems, formulate hypotheses, and select appropriate data collection and analysis methods, both quantitative and qualitative. Students apply these concepts in practice through writing research reports and completing small research projects, while adhering to ethical research standards and academic citation practices. Continuous assessment is used to foster critical thinking, practical skills, and student independence in conducting research.		

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	This course emphasizes active and interactive learning, engaging students in discussions and practical exercises on the definition of scientific research, its types, research design, and hypothesis formulation. Practical learning is reinforced through small research projects, data collection and analysis, and the preparation of research reports. Continuous assessment is integrated through assignments, practical exercises, and research projects, with regular feedback provided to enhance performance before the final assessment. The course also promotes time management and academic organization skills through a weekly schedule of activities, preparing students to effectively manage comprehensive research projects..

Student Workload (SWL) الحمل الدراسي للطالب
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Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب أسبوعياً
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب أسبوعياً
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50	

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

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Definition of scientific research and its importance.
Week 2	Types of scientific research (qualitative, quantitative, mixed methods).
Week 3	Identifying the research problem and its objectives.
Week 4	Review of previous studies and research methods.
Week 5	Formulating hypotheses and research questions.
Week 6	Research design: experimental, descriptive, exploratory.
Week 7	Data collection tools (questionnaires, datasets, literature review).
Week 8	Data analysis: quantitative and qualitative.
Week 9	Writing the research report: introduction, literature review.
Week 10	Writing the report: results, discussion, conclusion.
Week 11	Ethics in scientific research and citation practices.
Week 12	Formulating conclusions and recommendations.
Week 13	Preparing a small research project.
Week 14	Presenting and discussing research projects.
Week 15	Comprehensive review and preparation for the final exam.

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية						
Module Title	Medical Devices		Module Delivery			
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar			
Module Code	MED-302					
ECTS Credits	5					
SWL (hr/sem)	100					
Module Level	3	Semester of Delivery		1		
Administering Department	computer	College	science			
Module Leader	Israa Ahmed Abbas		e-mail	israaahmed@uodiyala.edu.iq		
Module Leader's Acad. Title	M.sc.		Module Leader's Qualification	Master		
Module Tutor	Name (if available)		e-mail	E-mail		
Peer Reviewer Name	Name		e-mail	E-mail		
Scientific Committee Approval Date	01/06/2023		Version Number	1.0		

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	7. Understand the fundamental principles of medical devices and their applications in healthcare. 8. Identify the operating mechanisms and functions of common diagnostic and therapeutic medical equipment. 9. Apply basic concepts of electronics, sensors, and signal processing in medical device technologies. 10. Analyze the performance, accuracy, and safety requirements of medical devices used in clinical environments. 11. Follow international standards and ethical practices related to medical device operation, maintenance, and patient safety. 12. Develop problem-solving skills for selecting, evaluating, and improving medical technologies to enhance healthcare services.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	11. Demonstrate understanding of the fundamental concepts and classifications of medical devices. 12. Explain the role of medical devices in modern healthcare and patient care. 13. Identify different types of diagnostic, monitoring, and therapeutic medical equipment. 14. Describe the basic operating principles of common medical devices used in healthcare facilities. 15. Recognize the relationship between medical devices and healthcare information systems. 16. Interpret data generated by medical devices to support clinical decision-making. 17. Evaluate the accuracy, reliability, and effectiveness of medical devices in healthcare settings. 18. Demonstrate awareness of safety procedures and quality standards related to medical equipment. 19. Understand the importance of device connectivity, data integration, and interoperability in healthcare environments. 20. Apply ethical, legal, and cybersecurity considerations associated with the use of medical devices and patient data.

Indicative Contents المحتويات الإرشادية	This module will cover the theoretical knowledge and practical skills required to understand medical devices and their applications in healthcare. The main topics or subjects that a student will study during the module include: 11. X-Ray Systems: Principles, components, and medical applications of X-ray imaging devices. 12. Audiological Systems: Technologies used for hearing assessment and diagnosis. 13. Electroencephalography (EEG): Principles, instrumentation, and clinical applications. 14. Electrocardiography (ECG): Cardiac signal acquisition, interpretation, and diagnostic uses. 15. Endoscopy Systems: Components, operation, and medical applications. 16. Magnetic Resonance Imaging (MRI) Systems – Part 1: Basic principles and system components. 17. Magnetic Resonance Imaging (MRI) Systems – Part 2: Image formation and clinical applications. 18. Nuclear Medical Imaging Systems – Part 1: Fundamental concepts and instrumentation. 19. Nuclear Medical Imaging Systems – Part 2: Advanced imaging techniques and applications. 20. Recording Electrodes: Types, characteristics, and biomedical applications. 21. Pulmonary Function Measurements: Methods and devices used to assess respiratory function.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Lectures Deliver core theoretical knowledge about medical devices, their operating principles, components, and healthcare applications. • Laboratory Sessions / Practical Workshops Provide hands-on experience with medical devices, measurement techniques, and biomedical instrumentation used in healthcare environments. • Device Demonstrations Observe and analyze the operation of common medical devices such as ECG, EEG, X-Ray, MRI, and pulmonary function measurement systems. • Case Studies Analysis of real clinical scenarios to understand the selection, application, and interpretation of data generated by medical devices. • Group Work / Team Projects Collaborative assignments involving the study, evaluation, or presentation of medical device technologies and their healthcare applications. • Tutorials / Discussion Sessions Guided discussions to clarify device operating principles, safety requirements, and clinical applications. • Self-directed Learning Encourages students to study independently using textbooks, technical manuals, research articles, and online educational resources.

	• Simulations / Virtual Labs Using software simulations and virtual environments to explore the functionality of medical devices and biomedical measurement systems. • Presentations and Reports Students prepare technical reports and presentations on medical devices, emerging technologies, and healthcare applications. • Assessments for Learning Quizzes, tests, assignments, laboratory activities, and practical examinations to reinforce learning outcomes.
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered semester 1:
Week 1	X-RAY (Machine)
Week 2	Audio Logical System
Week 3	Electroencephalogram (EEG)
Week 4	Electrocardiography (ECG)

Week 5	Endoscopy
Week 6	MRI SYSTEM PART 1
Week 7	MRI SYSTEM PART 2
Week 8	Nuclear Medical Imaging Systems Part 1
Week 9	Nuclear Medical Imaging Systems Part 2
Week 10	Recording Electrodes
Week 11	PULMONARY FUNCTION MEASUREMENTS
Week 12	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Blood Pressure Monitor
Week 2	Complete Blood Count (CBC) Analyzer
Week 3	Microscope
Week 4	Polymerase Chain Reaction (PCR)
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Biomedical Instrumentation: Principles and Applications (Webster – Wiley)	Yes
Recommended Texts	Compendium of Biomedical Instrumentation (Khandpur – Wiley, 2019)	yes
Websites		

Grading Scheme

مخطط الدرجات

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

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

المرحلة الثالثة
الكورس الثاني
فرع
المعلومات الطبية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	<u>Medical Documentation</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	<u>MED-323</u>				
ECTS Credits	<u>5</u>				
SWL (hr/sem)	<u>125</u>				
Module Level		UO	Semester of Delivery		1
Administering Department		COM	College	COS	
Module Leader	Name: Adel Abdul-Jabbar Mohamed		e-mail	E-mail: adel@uodiyala.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		MSc
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		1-6-2025	Version Number		

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Students will explore and become more familiar with: This module aims to: 6. Introduce the concept, architecture, and significance of Medical Documentation in modern healthcare systems.

	7. Explore the benefits, challenges, and ethical implications of implementing and managing the Health Record systems. 8. Demonstrate how to record clear, concise, timely, and objective entries in medical charts. 9. Equip students with knowledge of data standards and regulatory compliance in the context of Medical Documentation. 10. Develop critical awareness of user-centered design and usability issues in Medical Documentation for various stakeholders. 11. Provide practical insights into evaluating the quality of Medical Documentation and recognize common documentation errors in digital systems and how to avoid them.	
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	6- Explain the key components, functions, and types of Medical Documentation. 7- Evaluate the clinical, administrative, and legal benefits and risks associated with Medical Records implementation. 8- Critically assess issues related to privacy, data protection, and ethical concerns in Medical Records use. 9- Analyzes the impact of Medical Documentation systems on healthcare delivery, patient safety, and clinical workflows. 10- Design or critique basic Medical Documentation system components with a focus on usability and user experience.	
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: 7- Introduction to Medical Documentation 8- Medical Documentation components and systems 9- Implementation and Change Management 10- Usability and User Experience 11- Impact on Healthcare Delivery 12- Future Trends	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم		
Strategies	The class will "meet" the equivalent of two, two-hour for lecture/discussion, and practical sessions each week. The lectures and discussions will be a combination of synchronous and asynchronous discussions using WebCT. Students must have access to the Internet to facilitate demonstrating and using software. Many of the assignments should stress hands-on applications by the students. Each student will be expected to participate in all lectures. Class participation by all is expected.	

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	66	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	34	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Medical Documentation
Week 2	Principles of Effective Documentation
Week 3	Components of the Patient Record
Week 4	Clinical Terminology and Coding Basics
Week 5	Electronic Documentation Systems
Week 6	Legal and Ethical Aspects of Documentation
Week 7	mid exam
Week 8	Interdisciplinary Documentation
Week 9	Special Documentation Situations
Week 10	Documentation in Telemedicine and Mobile Health
Week 11	Quality Assurance and Auditing
Week 12	Role of documentation in clinical audits
Week 13	Chart reviews and quality improvement
Week 14	Future Trends in Medical Documentation

Week 15	Preparing for the final exam
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Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to the course and practical components.
Week 2	Writing mock progress notes (SOAP, PIE formats).
Week 3	Using EHR systems to enter patient data.
Week 4	Entering patient demographic data.
Week 5	Creating electronic medical records for patients.
Week 6	Reviewing and correcting sample documentation errors.
Week 7	Exam
Week 8	Role-play: documenting in a simulated clinical scenario.
Week 9	Recording clinical progress notes and documenting follow-up visits.
Week 10	Managing patient appointments and scheduling.
Week 11	Generating medical and statistical reports.
Week 12	Hands-on training in user access control and data encryption.
Week 13	Training on interoperability with healthcare information systems.
Week 14	Mini-project: creating a complete patient file (simulation).
Week 15	Group exercise: creating a complete patient chart.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Textbooks	- "Documentation Manual for Writing SOAP Notes in Clinical Practice"*** by Ginge Kettenbach - "Clinical Documentation Improvement: Achieving Excellence"*** by Glenn Krauss	Yes
Essential References Materials	* EHR practice tools (OpenMRS, PracticeFusion) * WHO/CDC guidelines on documentation and health records * HIPAA and data privacy law references	
Electronic Materials	Electronic Materials	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings

	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Pattern Recognition</u>			Module Delivery
Module Type	<u>Elective</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>COM-326</u>			
ECTS Credits	<u>5</u>			
SWL (hr/sem)	<u>125</u>			
Module Level	3	Semester of Delivery		
Administering Department	com	College	os	
Module Leader	Adil Abdulwahhab Al-Azzawi		e-mail	adil_alazzawi@uodiyala.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	E-mail
Peer Reviewer Name			e-mail	E-mail
Scientific Committee Approval Date	02/06/2025		Version Number	.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This course covers the techniques and gain proficiency of pattern recognition that are fundamental to a wide variety of application areas such as medical research, biometrics, computer vision, etc.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	126. Understands basic structure of pattern recognition systems. 127. Summarizes execution of a pattern recognition system. 128. Expresses principal units within a pattern recognition system. 129. Defines the relationship between pattern and feature. 130. Explains supervised and unsupervised pattern recognition approaches. 131. Analyzes the success of a feature recognition system.
Indicative Contents المحتويات الإرشادية	23. Introduction to Pattern Recognition, Feature Detection, Classification 24. Review of Probability Theory, Conditional Probability and Bayes Rule 25. Random Vectors, Expectation, Correlation, Covariance 26. Review of Linear Algebra, Linear Transformations 27. Decision Theory, ROC Curves, Likelihood Ratio Test 28. Linear and Quadratic Discriminants, Fisher Discriminant 29. Sufficient Statistics, Coping with Missing or Noisy Features 30. Template-based Recognition, Feature Extraction 31. Eigenvector and Multilinear Analysis 32. Training Methods, Maximum Likelihood and Bayesian Parameter Estimation 33. Linear Discriminant/Perceptron Learning, Optimization by Gradient Descent

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Pattern recognition theory and practice is concerned with the design, analysis, and development of methods for the classification or description of patterns, objects, signals, and processes. At the heart of this discipline is our ability to infer the statistical behavior of data from limited data sets, and to assign data to classes based on generalized notions of distances in a probabilistic space. Many commercial applications of pattern recognition exist today, including voice recognition (e.g., Amazon Alexa), fingerprint classification (e.g., MacBook Pro touch bar), and retinal scanners (e.g., your favorite cheesy sci-fi movie).

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3 and 9	
	Assignments	2	10% (10)	5 and 11	
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	
Summative assessment	Midterm Exam	2hr	10% (10)	7	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction: An Overview of Machine Learning
Week 2	Decision Theory: Bayes Rule
Week 3	Decision Theory: Gaussian Classifiers
Week 4	Decision Theory: Generalized Gaussian Classifiers
Week 5	Parameter Estimation: Maximum Likelihood
Week 6	Parameter Estimation: The Bayesian Approach
Week 7	Mid-term Exam
Week 8	Decision Theory: Discriminant Analysis
Week 9	Parameter Estimation: The Expectation Maximization Theorem
Week 10	Parameter Estimation: Discriminative Training
Week 11	Experimental Design: Foundations of Machine Learning
Week 12	Experimental Design: Evaluation
Week 13	Statistical Significance
Week 14	Jackknifing, Bootstrapping and Combining Classifiers
Week 15	Introduction to Nonparametric Techniques
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Gaussian Distributions
Week 2	Bayesian Decision Theory

Week 3	ML and Bayesian Parameter Estimation
Week 4	Linear Discriminant Analysis
Week 5	
Week 6	Expectation Maximization (EM)
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	A. Lindholm, N. Wahlstrom, F. Lindsten and T. Schon, Machine Learning: A First Course for Engineering and Scientists, Cambridge University Press, New York, New York, USA, ISBN: 978-1-108-84360-7, pp. 338, 2022. URL: http://smlbook.org/book/sml-book-draft-latest.pdf	Yes
Recommended Texts	C.M. Bishop, Pattern Recognition and Machine Learning, Springer, ISBN: 978-0387310732, 2003.	No
Websites	https://isip.piconepress.com/courses/temple/ece_8527/syllabus/current/	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	Pathophysiology			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MED-322				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	3		Semester of Delivery		
Administering Department	computer		College	science	
Module Leader	Mohammed Jasim Ismael		e-mail	mhsh_88@uodiyala.edu.iq	
Module Leader's Acad. Title	Assistant Professor Dr		Module Leader's Qualification	PhD	
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	01/06/2025		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Define the fundamental concepts of pathophysiology and explain its scope and importance in understanding disease processes.

	2. Explain homeostasis and allostasis and describe their roles in maintaining normal physiological function. 3. Describe cellular adaptation, injury, and cell death, including the major mechanisms and pathological consequences. 4. Explain the mechanisms of inflammation, healing, and tissue repair and relate them to common disease processes. 5. Describe the normal immune response and explain the pathophysiological mechanisms of hypersensitivity, autoimmune diseases, and immunodeficiencies. 6. Identify the major hematological disorders and explain the pathophysiology, causes, and clinical manifestations of anemia, leukemia, lymphoma, and coagulation disorders. 7. Explain the pathophysiology of cardiovascular disorders, including hypertension, atherosclerosis, ischemic heart disease, myocardial infarction, heart failure, arrhythmias, and stroke. 8. Differentiate between obstructive and restrictive respiratory disorders and explain the pathophysiology of asthma, COPD, pneumonia, pulmonary embolism, and respiratory failure. 9. Explain the mechanisms underlying renal and urinary disorders, including acute and chronic kidney disease, glomerulonephritis, nephrotic syndrome, urinary tract infection, and urinary obstruction. 10. Describe the pathophysiology of gastrointestinal and hepatobiliary disorders, including peptic ulcers, inflammatory bowel disease, hepatitis, cirrhosis, pancreatitis, and gallbladder disorders. 11. Explain the pathophysiology of major endocrine disorders, including diabetes mellitus, thyroid dysfunction, adrenal disorders, and pituitary abnormalities. 12. Describe the mechanisms and clinical manifestations of major nervous system disorders, including stroke, TIA, epilepsy, Parkinson's disease, multiple sclerosis, and dementia. 13. Explain the pathophysiology of musculoskeletal and integumentary disorders, including osteoporosis, osteoarthritis, rheumatoid arthritis, fractures, eczema, psoriasis, and burns. 14. Interpret basic laboratory and diagnostic findings related to common pathological conditions, including blood cell counts, ECG findings, urinalysis, and liver and kidney function tests. 15. Apply pathophysiological concepts to clinical case scenarios by relating signs, symptoms, laboratory findings, and disease mechanisms. 16. Demonstrate clinical reasoning skills in identifying disease processes and explaining the relationship between underlying pathophysiology and clinical manifestations.
Module Learning Outcomes	Upon successful completion of this module, students will be able to: 1. Explain the fundamental principles of pathophysiology and the mechanisms underlying human diseases.

مخرجات التعلم للمادة الدراسية	2. Describe the mechanisms of homeostasis, allostasis, cellular adaptation, cellular injury, and cell death. 3. Explain the pathophysiological mechanisms of inflammation, immune responses, healing, and tissue repair. 4. Identify and explain the major pathophysiological changes associated with immune, inflammatory, and hematological disorders. 5. Describe the pathophysiology, causes, risk factors, and clinical manifestations of major cardiovascular and respiratory disorders. 6. Explain the underlying mechanisms of renal, urinary, gastrointestinal, hepatic, and pancreatic diseases. 7. Describe the pathophysiology of major endocrine disorders, including diabetes mellitus and thyroid, adrenal, and pituitary diseases. 8. Explain the pathophysiological mechanisms of major neurological, musculoskeletal, and integumentary disorders. 9. Differentiate between normal and abnormal physiological processes using appropriate clinical and laboratory findings. 10. Interpret basic diagnostic and laboratory findings related to common pathological conditions, including blood tests, ECGs, urinalysis, and liver and kidney function tests. 11. Apply pathophysiological knowledge to clinical case scenarios by linking signs, symptoms, laboratory results, and underlying disease mechanisms. 12. Demonstrate clinical reasoning and problem-solving skills in analyzing disease processes and their effects on body systems. 13. Use appropriate medical terminology and scientific resources to communicate information about pathophysiological conditions. 14. Demonstrate awareness of the relationship between pathophysiology, clinical manifestations, diagnosis, and patient management.
Indicative Contents المحتويات الإرشادية	This module will cover the theoretical knowledge and practical skills required to understand Contents for Pathophysiology. the main topics or subjects that a student will study during the module, including: 1. Introduction to Pathophysiology: Definition and scope; homeostasis and allostasis; cellular adaptation, injury, and death; inflammation, healing, and repair 2. Immune and Inflammatory Disorders: Immune response; hypersensitivity reactions (Type I–IV); autoimmune diseases; immunodeficiencies 3. Hematological Disorders: Anemia and its types; leukemia and lymphoma; coagulation disorders; thrombosis and blood clotting 4. Cardiovascular Pathophysiology: Hypertension; atherosclerosis; ischemic heart disease; angina; myocardial infarction; heart failure; arrhythmias; stroke; peripheral vascular disease

	5. Respiratory System Disorders: Obstructive and restrictive diseases; asthma; COPD; pneumonia; pulmonary embolism; respiratory failure 6. Renal and Urinary Disorders: Acute and chronic kidney disease; glomerulonephritis; nephrotic syndrome; urinary tract infections; urinary obstruction 7. Gastrointestinal Disorders: Gastritis; peptic ulcers; inflammatory bowel disease; Crohn's disease; ulcerative colitis; hepatitis; cirrhosis; pancreatitis; gallbladder disorders 8. Endocrine System Disorders: Diabetes mellitus; thyroid dysfunction; adrenal gland disorders; pituitary abnormalities 9. Nervous System Disorders: Stroke; transient ischemic attack; seizures and epilepsy; Parkinson's disease; multiple sclerosis; dementia and neurodegenerative disorders 10. Musculoskeletal and Integumentary Disorders: Osteoporosis; osteoarthritis; rheumatoid arthritis; fractures and bone healing; eczema; psoriasis; burns 11. Laboratory and Diagnostic Applications: Blood cell analysis; differential counts; ECG interpretation; urinalysis; liver and kidney function tests 12. Clinical Case-Based Applications: Analysis of clinical cases using signs, symptoms, laboratory findings, and pathophysiological mechanisms
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Interactive Lectures Present pathophysiological concepts through explanations, clinical examples, questions, and discussions to promote active learning. Case-Based Learning Use clinical cases to help students connect disease mechanisms with signs, symptoms, laboratory findings, and clinical manifestations. Problem-Based Learning (PBL) Students analyze patient problems, identify underlying pathophysiological mechanisms, and develop evidence-based explanations. Group Discussions Students work in small groups to discuss disease processes, compare conditions, and explain relationships between causes and clinical manifestations. Clinical Reasoning Activities Students interpret clinical information and develop logical connections between pathophysiology, symptoms, diagnostic findings, and possible diseases. Laboratory Demonstrations Demonstrate blood cell analysis, differential counts, urinalysis, liver and kidney function tests, and other relevant diagnostic procedures.

	7. ECG Interpretation Exercises Provide basic ECG examples to help students recognize and relate cardiovascular abnormalities to underlying pathophysiological processes. 8. Visual Learning Use diagrams, flowcharts, anatomical illustrations, animations, and clinical images to explain complex disease mechanisms. 9. Question-and-Answer Sessions Use questions throughout the lessons to assess understanding, reinforce important concepts, and identify areas requiring further explanation. 10. Student Presentations Students prepare short presentations on selected diseases or pathological mechanisms to develop scientific communication and presentation skills. 11. Formative Assessment Use quizzes, short-answer questions, MCQs, case questions, and classroom activities to continuously evaluate student progress. 12. Self-Directed Learning Encourage students to use textbooks, medical databases, clinical resources, and educational videos to expand their knowledge of pathophysiology. 13. Digital and E-Learning Resources Integrate electronic resources, clinical videos, interactive materials, and medical databases to support independent and classroom learning.
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	71	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	79	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered semester 1:
Week 1	Introduction to Pathophysiology
Week 2	Immune and Inflammatory Disorders
Week 3	Hematological Disorders
Week 4	Cardiovascular Pathophysiology
Week 5	Respiratory System Disorders
Week 6	Renal and Urinary Disorders
Week 7	Gastrointestinal Disorders
Week 8	Endocrine System Disorders
Week 9	Nervous System Disorders
Week 10	Nervous System Disorders
Week 11	Musculoskeletal and Integumentary Disorders
Week 12	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library
Required Texts	Pathophysiology: The Biologic Basis for Disease in Adults and Children*** by Kathryn McCance & Sue Huether	Yes
Recommended Texts	Understanding Pathophysiology*** by Sue Huether & Kathryn McCance * Medical databases (UpToDate, Medscape, PubMed)	yes
Websites		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	<u>Software Application-Medical Informatics</u>	Module Delivery
Module Type	<u>Core</u>	☒ Theory ☒ Lecture ☒ Lab
Module Code	<u>COM-321</u>	

ECTS Credits	3		☐ Tutorial ☐ Practical ☐ Seminar	
SWL (hr/sem)	75			
Module Level	UC	Semester of Delivery	6	
Administering Department	com	College	os	
Module Leader		e-mail		
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Master	
Module Tutor		e-mail	E-mail	
Peer Reviewer Name		e-mail	E-mail	
Scientific Committee Approval Date	1-6-2025	Version Number	.0	

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

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This module aims to provide students with a foundational understanding of medical informatics, focusing on how information technology is applied in healthcare to enhance patient care, medical research, and administrative processes. It introduces key concepts, tools, and methods used in managing health data, clinical decision support, and the development of health information systems. The course also explores trends in medical informatics, such as electronic health records (EHRs), telemedicine, and data analytics, with a focus on practical applications and ethical considerations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module, students will be able to: 8. Define the key concepts of medical informatics and its role in modern healthcare. 9. Describe the components and architecture of health information systems, including EHRs and clinical decision support systems. 10. Analyze the benefits and challenges associated with implementing informatics solutions in healthcare environments.

	11. Evaluate the ethical, legal, and security issues related to health data management, including privacy, data protection, and patient consent. 12. Apply basic informatics tools and techniques in clinical and administrative scenarios, such as coding systems, data entry, and visualization. 13. Discuss emerging trends in medical informatics, such as telemedicine, AI-based decision-making, and health data analytics. 14. Collaborate in interdisciplinary teams to design or recommend informatics solutions for healthcare challenges.
Indicative Contents المحتويات الإرشادية	1. Introduction to Medical Informatics • Definition, scope, and importance • Historical evolution and current trends 2. Healthcare Data and Information Management • Types of health data (structured vs. unstructured) • Data standards and coding systems (ICD, SNOMED, HL7) • Data privacy, security, and governance 3. Health Information Systems (HIS) • Electronic Health Records (EHRs) and Personal Health Records (PHRs) • Clinical Decision Support Systems (CDSS) • Health Information Exchange (HIE) 4. Informatics in Clinical Practice • Role of informatics in diagnosis, treatment, and patient care • Applications of telemedicine and remote monitoring • Case studies of informatics-driven care models 5. Artificial Intelligence and Data Analytics in Healthcare • Basics of machine learning and AI in clinical settings • Predictive analytics and personalized medicine • Challenges of integrating AI in healthcare 6. Legal, Ethical, and Social Issues • Patient confidentiality, data protection laws (e.g., HIPAA, GDPR) • Ethics of health data sharing and AI-based decisions • Addressing biases in health informatics systems 7. Project and Case Study Discussions • Designing a simple health informatics solution (group project) • Case studies on successful and failed implementations of health informatics systems 8. Future Directions in Medical Informatics • Emerging technologies (blockchain, Internet of Medical Things) • Trends in global health informatics and public health surveillance • Career pathways in medical informatics

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Students will gain hands-on experience with EHR systems, CDSS tools , and health data visualization through group-based activities guided by facilitators.

	Using Problem-Based Learning (PBL) , they will solve real healthcare scenarios such as designing telemedicine solutions, supported by expert guest lectures. Collaborative projects, including simple HIS prototypes , will enhance teamwork and communication. A core element is practicing SQL to create and manage medical databases, retrieve patient and lab data, join clinical datasets, and generate reports, preparing students with practical skills in medical informatics.
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Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5)	2 and 7	
	Assignments	2	10% (5)	Continue	
	Projects / Lab.	1	10% (10)-	11	
	Report	1	10% (10)	13	
Summative assessment	Midterm Exam	2hr	10% (10)	14	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week 1	Introduction to Medical Informatics and Software Tools: Overview of medical informatics, Role of software in healthcare delivery, Types of software: clinical, administrative, analytical, imaging
Week 2	Electronic Health Records (EHR) Systems: Introduction, advantages, CPOE, CDSS, EHR Registries,

Week 3	Hospital Information Systems (HIS): definition, Database, Components, Benefits,
Week 4	Hospital Information Systems (HIS): HIS Examples, Advantages, system life cycle, system training
Week 5	Clinical Decision Support Systems (CDSS): definition, features, Types of CDSS.
Week 6	Clinical Decision Support Systems (CDSS): (con.) Types of CDSS ,CDS & CDSS, collected Data, Improve Safety and Quality, Benefits, the Future of CDSS
Week 7	Exam
Week 8	Medical Imaging Informatics: PACS, Components
Week 9	Medical Imaging Informatics (con): Mobile Technology, Hospital Desktop Computer, Advantages and Disadvantages
Week 10	Medical Databases and SQL Basics: definition, role dataset in Healthcare, types dataset
Week 11	Medical Databases and SQL Basics: (con.) Introduction to SQL for medical databases, Storing and retrieving healthcare data, Querying patient data and lab records
Week 12	Cybersecurity and Privacy in Health Software: Importance of security in medical systems, HIPAA/GDPR overview,
Week 13	Cybersecurity and Privacy in Health Software (con.): Secure logins, access control, and audit trails
Week 14	Review
Week 15	Final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Medical Informatics, Content: Definition of medical informatics and its importance. History of medical informatics. Activities: Open discussion on medical informatics and its applications.
Week 2	Health Data Management: How to manage health data, including storage and security. Activities: Implement a simple health data management program.
Week 3	Introduction to the course and practical components: Overview of Electronic Patient Record (EPR) systems, interfaces, and objectives.
Week 4	Navigate and edit records in an EHR system (OpenMRS or GNU Health), Hands-on training: installation and login
Week 5	Creating user accounts (physician, nurse, admin staff), Understanding user roles and permissions.
Week 6	Entering patient demographic data, Ensuring data accuracy and completeness.
Week 7	Creating electronic medical records for patients, Adding medical history and basic examinations.
Week 8	Entering laboratory and diagnostic test results, Linking test results to patient records
Week 9	Exam

Week 10	Simulate CDSS alerts for drug interactions
Week 11	Introduction SQL built a sample patient database
Week 12	Run SQL queries on a sample patient database
Week 13	Run SQL queries on a sample patient database
Week 14	Artificial Intelligence in Medical Informatics, Content: Introduction to artificial intelligence and its applications in medicine, Activities: Workshop on AI tools.
Week 15	Artificial Intelligence in Medical Informatics: Workshop on AI tools.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Health Informatics: Practical Guide for Healthcare and Information Technology Professionals (6 th Edition) by Robert Health Informatics: An Interprofessional Approach by Nelson & Staggers Electronic Health Records by Richard Garte	Yes
Recommended Texts	Software documentation (OpenMRS, GNU Health, Power BI, SQL) * WHO and HIMSS resources on digital health software	Yes
Electronic Materials	Electronic Materials	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Digital Signal Processing</u>			Module Delivery
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>COM-327</u>			
ECTS Credits	<u>6</u>			
SWL (hr/sem)	<u>150</u>			
Module Level	UO	Semester of Delivery	6	
Administering Department	com	College	os	
Module Leader	Yahiea Mohammed Hussain		e-mail	yahiea@uodiyala.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	E-mail
Peer Reviewer Name			e-mail	E-mail
Scientific Committee Approval Date	02/09/2025		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Specific outcomes of instruction (The student will be able to): 1-Understand basic discrete-time systems, linearity, linear time-invariance, Stability, impulse response, and discrete convolution. 2-Implement discrete time systems, recursive and non-recurse realizations. 3-Perform Z transform and finding the inverse Z transform including its properties. 4- Understand frequency analysis of both continuous and discrete signals. 5-Understand frequency response of linear time invariant (LTI) systems. 6-Understand discrete Fourier transform, its properties, and applications. 7-Design digital filters both FIR, IIR filters. 8-Understand of multi-rate signal processing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	132. Identify problems where DSP techniques are applicable. 133. Apply selected basic DSP techniques, judge applicability of more advance techniques. 134. Participate in the design of systems and filters and learn from experience.
Indicative Contents المحتويات الإرشادية	This course is primarily aimed at students with technical backgrounds who wish to design and develop products and services using DSP. A background in basic systems and signals is required for the course. Students need at least a basic knowledge of know the types of systems and signals to complete the assignments for this course. Students who have not taken the principle of signals and systems have equivalent background will be required to complete supplementary work to learn signals and systems at the beginning of the course.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The course begins by describing what the types of systems and signals, Discrete-time signals and systems techniques can do. After an introduction to some basic concepts and techniques, the course illustrates both the potential and current limitations of these techniques with examples from a variety of applications. We spend some time on understanding the z-transform, inverse z-transform, and the Z-transform properties. Exercises will include hands-on application of basic DSP techniques as well as selection of appropriate technologies for a given problem and anticipation of design implications. Then the student will learn how and where use the discrete Fourier series and discrete Fourier transform. And the student will able to design a digital filter structures In a final project, groups of students will participate in the creation of an DSP-based application

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	2 and 7	
	Assignments	2	10% (10)	2 and 10	
	Projects / Lab.	-	-	-	
	Report	1	10% (10)	13	
Summative assessment	Midterm Exam	2hr	20% (20)	7	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to discrete linear systems, Discrete time signals.
Week 2	Shift invariance, Stability and causality
Week 3	Impulse response, Difference equations
Week 4	Discrete-Time Fourier Transform
Week 5	Linear Time Invariant Systems
Week 6	Frequency response of linear time invariant systems
Week 7	Mid-term Exam
Week 8	Convolution and correlation
Week 9	Z-transforms
Week 10	Definition of DFT and relation to Z-transform.
Week 11	Digital filter design
Week 12	Digital Butterworth filters
Week 13	Design of FIR digital filters
Week 14	Structures and properties of FIR and IIR filters,

Week 15	Computation of the discrete Fourier transform
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Discrete-Time Signal Processing by A. V. Oppenheim and R. W. Schaffer, with M. T. Yoder and W. T. Padgett (PrenticeHall/Pearson, 2009, ISBN: 978-0131988422)	Yes
Recommended Texts	Digital Signal Processing: A Computer-Based Approach, S. K. Mitra, McGraw-Hill,	Yes
Recommended books and references (scientific journals, reports...)	Schaum's Outline of Digital Signal Processing, M. Hays, McGraw-Hill, 1999: This complements Mitra with lots of worked examples and summaries of each topic as well as a large number of additional problems.	

Grading Scheme

مخطط الدرجات

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