Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department

Academic Program and Course Description Guide

2025

نموذج وصف البرنامج الاكاديمي

مراجعة اداء مؤسسات التعليم العالي (مراجعة البرنامج الاكاديمي)

1	**المؤسسة التعليمية**	**جامعة االتراث**
2	القسم الجامعي/المركز	كلية العلوم / قسم الامن السيبراني
3	اسم البرنامج الاكاديمي	الامن السيبراني
4	اسم الشهادة النهائية	بكالوريوس علوم في الامن السيبراني
5	النظام الدراسي	نظام مسار بولونيا (المستوى الاول والثاني والثالث)
6	برنامج الاعتماد المعتمد	
7	المؤثرات الخارجية الاخرى	الامتحانات المركزية
8	تاريخ اعداد الوصف	2023 - 2025

المقدمة :

يعد 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 سنويا عبر
إجراءات وبرامج التدقيق الداخلي أو الخارجي مثل برنامج الممتحن الخارجي .

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

ويتضمن هذا الدليل بنسخته الثانية وصفا 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 فضلا عن اعتماد وصف البرنامج
الأكاديمي المعمم بموجب كتاب دائرة الدراسات ت م 3/2906 في 3/5/2023 فيما يخص البرامج التي تعتمد مسار بولونيا أساسا لعملها.

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

مفاهيم ومصطلحات

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

وصف المقرر: يوفر إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنا 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 وقابلًا للتطبيق .

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

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

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

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

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

1. رؤية البرنامج

طموح القسم المحافظة على السمعة العلمية المتميزة المتأتية من امتلاك خريجي القسم المعرفة والمهارة والقدرة على التحليل في مجتمع المعلوماتية.

2. رسالة البرنامج

ان يكون قسم الامن السيبراني مركزاً ريادياً في التعليم العالي والبحث العلمي، وان يكون مساهما في رفد المجتمع بكودر علمية مؤهلة تأهيلًا عاليا في اكتساب المعرفة

3. اهداف البرنامج

1- التطلع المستمر نحو التفوق المعرفي في التعليم والبحث العلمي والخدمة الاحترافية في مخلف العلوم
2- اعداد الطلبة لسوق العمل وتنمية قدراتهم غلى التفاعل والتواصل مع الاخرين من خلال المشاركة الفعالة في برنامج التدريب الميداني.
3- اكتساب المهارات لعرض الافكار والعمل ضمن فريق واحد وذلك من خلال مشاريع التخرج.
4- تأهيل الطلبة للدراسات العليا (دبلوم عالي ، ماجستير ، دكتوراه) في مجال الامن السيبراني.
5- اعداد القيادات العلمية المتخصصة من خلال برنامج الدراسات العليا.
6- التفاعل مع العلوم الاخرى وبالاخص منها الرياضيات.

4. الاعتماد البرامجي

هل البرنامج حاصل على الاعتماد البرامجي؟ ومن اي جهة ؟

The program is new and in its third phase only, as it was created in the year 2023-2024.

5. هيكلية البرنامج

هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات
متطلبات المؤسسة	4	8	%16	
متطلبات الكلية	2	4	%8	
متطلبات القسم	44	3	%88	

5. هيكلية البرنامج

هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات

متطلبات المؤسسة	4	8	%16	
متطلبات الكلية	2	4	%8	
متطلبات القسم	44	3	%88	
التدريب الصيفي	40	2	%100	
اخرى				

7. مخرجات التعلم المتوقعة للبرنامج

أ- الاهداف المعرفية

أ-1 اكساب الطلبة المعرفة والمهارات والسلوكيات اللازمة لتحليل مشاكل الامن السيبراني وتصميم الحلول المناسبة من خلال افضل الممارسات لتمكينهم من التميز والابداع وتأهيلهم لتبوء افضل المناصب في سوق العمل.

أ-2 القدرة على الابتكار مع الالتزام بالاطار المهني والقانوني والاخلاقي والعمل بفاعلية ضمن فرق عمل متعدد الاختصاصات .

أ-3 تمكين الطالب من التعلم الذاتي المستمر لمواصلة تعزيز مهاراتهم والتعرف على المستجدات المؤثرة في صناعة تقنيات الامن السيبراني وتبني تقنيات واساليب جديدة.

أ-4 تمكين الطلبة من تحليل ومناقشة النتائج باستعمال المعارف التي اكتسبها.

أ-5 زيادة خبرة الطلبة في كيفية التأكد من صحة التي وصلت اليه في البحث العلمي والاستنتاج.

أ-6 زيادة الخبرة المهنية للطلبة من خلال تطبيق المعارف والمهارات التي زودوا بها اثناء مدة التعليم. أ7- القدرة على الالتحاق في برامج الدراسات العليا في موضوعات الامن السيبراني وفي موضوعات اخرى.

ب -الاهداف المهاراتية الخاصة بالبرنامج:

ب 1 – اكتساب المهارات الخاصة باساسيات البرمجة والشفير والامن الالكتروني

ب 2 – القدرة على اجراء الابحاث

ج- الاهداف الوجدانية والقيمية:

ج-1 اكتساب المهارات الخاصة باسس علوم الحاسوب والتعاون وتشجيع روح العمل الجماعي.

ج-2 تعزيز القيم الاخلاقية لدى الطلبة فيما يتعلق بالانتماء واحترام النظام ومراعاة اللوائح والضوابط الادارية.

ج-3 غرس روح المبادرة والايجابية لدى الطلبة بما يناسب عملهم في المستقبل

ج-4 تشجيع الطلبة على المشاركة في الانشطة اللاصفية والتطوعية والمجتمعية.

ج -5 تعزيز قيم المواطنة والهوية والايثار

8. استراتيجيات التعليم والتعلم

1. القاء المحاضرات النظرية والتطبيقية. واستعمال الكتب المنهجية. والكتب المساعدة. والوسائل الحديثة في التعلم.
2. اكتساب الطلبة مهارات اساسية في الحاسوب والتعلم الالكتروني. وتوظيف الاجهزة الاحديثة في عملية التعلم.
3. اعطاء الطلبة الحرية الكافية في اختيار موضوعات بحوث التخرج. لاستخراج طاقاتهم الفكرية. والكشف عن اهتماماتهم و ميولهم العلمية.
4. منح الطلبة الفرصة في طرح الافكار اثناء الحاضرات. وافساح المجال امامهم للمناقشة وابداء الرأي. وتحليل البيانات والتوصل الى الاستنتاجات.

9. طرائق التقييم
1. الامتحانات الالكترونية 2. الامتحانات المركزية والشهرية. 3. الامتحانات اليومية. 4. الواجبات اليومية. 5. التقارير العلمية. 6. الامتحانات المختبرية الحاسوبية. 7. مشاريع التخرج.

10. الهيئة التدريسية					
اعضاء هيئة التدريس					
الرتبة العلمية والشهادة	التخصص		المتطلبات / المهارات الخاصة (ان وجدت)		اعداد الهيئة التدريسية
	عام	خاص			ملاك	محاضر
استاذ مساعد	علوم الحاسوب	الامن السيبراني				1
استاذ مساعد	علوم الحاسوب	امنية المعلومات				2
استاذ مساعد	علوم الحاسوب	امنية وسرية المعلومات				1
استاذ مساعد	علوم الحاسوب	المعالجات المتوازية والمعمارية				1
استاذ مساعد	علوم الحاسوب	سرية بيانات				1
مدرس دكتور	علوم الحاسوب	ذكاء اصطناعي			1	1
مدرس	علوم الحاسوب	انظمة تشغيل			1	
مدرس	علوم الحاسوب	تقنية معلومات			1	
مدرس	علوم الحاسوب	علوم الحاسوب			1	1
مدرس مساعد	علوم الحاسوب	برمجيات			1	1
مدرس مساعد	علوم الحاسوب	رياضيات				2

مدرس مساعد	علوم الحاسوب	علوم الحاسوب				4
مدرس مساعد	هندسة حاسوب	هندسة حاسوب				1

11. التطوير المهني
توجيه اعضاء هيئة التدريس الجدد
1. التعليم الالكتروني. 2. استخدام وسائل الانترنيت. 3. استخدام وسائل التواصل الحديثة. 4. استخدام وسائل الاتصال الحديثة. 5. نشاطات لا صفية. 6. دورات تدريبية متطورة في تعلم البرامج الحديثة. 7. الاستشارات العلمية وسبل تطورها وتطبيقها في مختلف المجالات.
التطوير المهني لاعضاء هيئة التدريس
تصف بايجاز خطة وترتيبات التطور الاكاديمي والمهني لاعضاء هيئة التدريس كأستراتيجيات التدريس والتعلم، وتقييم نتائج التعلم، التطوير المهني وما الى ذلك.

12. معيار القبول
1. حسب تعليمات وزارة التعليم العلي والبحث العلمي بتحديد المعدل المطلوب لكليات العلوم في الجامعات الاهلية 2. معدل الطالب ضمن قوائم القبول المركزي باستثناء ابناء التدريسيين وابناء الشهداء والامتيازات التي تنص عليها التعليمات الخاصة بالوزارة حيث يتم قبولهم حسب الرغبة لتوزيعهم على الاقسام العلمية

13. خطة تطوير البرنامج
تنمية قدرات الطلبة في البحث والتقصي من خلال حضور المناقشات. وكتابة البحوث العلمية التخصصية. وتنمية قدرات الاستنتاج والحجاج. والحث على زيارة المكتبة اسبوعياً. للاطلاع على المصادر والكتب والمجلات العلمية, بوصفها جميعا موترد للحصول على المعلومات , فضلا عن استعانة الطلبة بشبكات الانترنت والتعليم الالكتروني والحاسوبي , والمراجع الالكترونية , والمواقع العلمية المتخصصة.

البرنامج الاكاديمي

مسار بولونيا – المستوى الاول والثاني والثالث

2026-2025

Republic of Iraq - Ministry of Higher Education and Scientific Research
Al-Turath University
Bachelor's degree in cybersecurity (First cycle)
Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr
Program Curriculum (2023 - 2024)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي
جامعة التراث
بكالوريوس في الأمن السيبراني (الدورة الثالثة)
أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوربية - كل وحدة اوربية = ٢٥ ساعة
المنهاج الدراسي للعام 2025 - 2026

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
UGI	One	1	CYBS-101	Programming (1)	برمجة (1)	English	2		2		1		3	78	122	200	8.00	C	
		2	CYBS-102	Discrete Structures (1)	هياكل متقطعة (1)	English	2				1		3	48	52	100	4.00	B	
		3	CYBS-103	Logic Design Fundamentals	اساسيات التصميم المنطقي	English	2		2				3	63	87	150	6.00	C	
		4	CYBS-104	Information Security Principles	مبادئ أمن المعلومات	English	2				2		3	63	62	125	5.00	B	
		5	CYBS-105	Calculus	رياضيات	English	2				1		3	48	27	75	3.00	S	
		6	UOM1021	English Language (1)	اللغة الانكليزية (1)	English	2						2	32	18	50	2.00	S	
		7	UOM1040	Democracy and Human Rights	الديمقراطية وحقوق الانسان	Arabic	2						2	32	18	50	2.00	S	
						Total	14	0	4	0	5	0	19	364	386	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
UGI	Two	1	CYBS-107	Advanced Programming	البرمجة المتقدمة	English	2		2		1		3	78	97	175	7.00	C	
		2	CYBS-108	Computer Organization	تنظيم الحاسوب	English	2		2		1		3	78	72	150	6.00	C	
		3	CYBS-109	Cybersecurity Fundamentals	اساسيات الأمن السيبراني	English	2				2		3	63	62	125	5.00	B	
		4	CYBS-110	Discrete Structures (2)	هياكل متقطعة (2)	English	2				1		3	48	52	100	5.00	B	
		5	CYBS-111	Probabilities & statistics	الاحتمالات والإحصاء	English	2				1		3	48	27	75	5.00	S	
		6	UOM1011	Arabic Language (1)	لغة عربية (1)	Arabic	2						2	32	18	50	2.00	S	
						Total	12	0	4	0	6	0	18	395	346	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
	Three	1	CYBS-201	Object-Oriented Programming (1)	البرمجة الكيانية (1)	English	2		2		1		3	78	122	200	6.00	C	
		2	CYBS-202	Data Structures	هياكل البيانات	English	2		2				3	63	62	125	4.00	B	
		3	CYBS-203	Computational Theory	النظرية الاحتسابية	English	2				1		3	48	27	75	3.00	S	
		4	CYBS-204	Database Basics	أساسيات قواعد البيانات	English	2		2				3	63	37	100	4.00	B	
		5	CYBS-205	Cryptography	التشفير	English	2		2		1		3	78	122	200	6.00	C	
		6	CYBS-206	Static Websites Programming	برمجة مواقع الويب الثابتة	English	2		2				3	150	56	94	5.00	B	
		7	UOM2022	English Language (2)	اللغة الانكليزية (2)	English	2						2	32	18	50	2.00	S	

					Total	14	0	8	0	3	0	17	362	388	750	30.00			

UGII	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
	Four	1	CYBS-207	Object-Oriented Programming (2)	البرمجة الكيانية (2)	English	2		2		1		3	78	97	175	7.00	C	
		2	CYBS-208	Cybersecurity tools	أدوات الأمن السيبراني	English	2		2				3	48	77	125	6.00	C	
		3	CYBS-210	Software Security	أمن البرامجيات	English	2				1		3	48	77	125	6.00	B	
		4	CYBS-211	Dynamic Websites Programming	ابرمجة مواقع الويب المتحركة	English	2		2				3	48	77	125	7.00	C	
		5	UOM2050	Ba'ath crimes in Iraq	جرائم البعث في العرق	Arabic	2						2	32	18	50	2.00	S	
		6	UOM2012	Arabic Language (2)	لغة عربية (2)	Arabic	2						2	32	18	50	2.00	S	
						Total	12	0	8	0	2	0	19	317	401	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
UGIII	Five	1	CYBS-301	Coding and information Theory	الترميز ونظرية المعلومات	English	2				1		3	48	102	150	6.00	C	
		2	CYBS-302	Cloud Computing principles	مبادئ الحوسبة السحابية	English	2		2				3	63	62	125	5.00	B	
		3	CYBS-303	Computer Networks	شبكات الحاسوب	English	2		2				3	63	62	125	5.00	B	
		4	CYBS-304	Malicious Codes analysis	تحليل الشفرات الخبيثة	English	2		2				3	63	87	150	6.00	C	
		5	CYBS-305	Artificial Intelligence	ذكاء أصطناعي	English	2		2				3	63	37	100	4.00	B	
		6	CYBS-306	Computer Architecture	معمارية الحاسوب	English	2				1		3	48	52	100	4.00	B	
						Total	12	0	8	0	2	0	18	348	402	750	30.00		

	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
	Six	1	CYBS-307	Compiler Design	تصميم المترجمات	English	2		2				3	63	62	125	5.00	C	
		2	CYBS-308	Network Security	أمن الشبكات	English	2		2				3	63	62	125	5.00	C	
		3	CYBS-309	Database Security	أمن قواعد البيانات	English	2				1		3	48	77	125	5.00	C	
		4	CYBS-310	Awareness and Training for Security	التوعية والتدريب في الأمن	English	2				1		3	48	77	125	5.00	C	
		5	CYBS-311	Secure Communication Protocols	بروتوكولات الاتصالات الأمنة	English	2				1		3	48	77	125	5.00	C	
		6	CYBS-312	Ethical Hacking	القرصنة الاخلاقية	English	2		2				3	63	62	125	5.00	C	
						Total	12	0	6	0	3	0	18	333	417	750	30.00		

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
	Seven	1	CYBS-401	Operating Systems	نظم التشغيل	English	2		2				3	63	62	125	5.00	C	
		2	CYBS-402	Internet of Things Security (IOT)	امن انترنت الاشياء	English	2				1		3	48	52	100	4.00	C	
		3	CYBS-403	Web applications Programming	برمجة تطبيقات الويب	English	2		2				3	63	62	125	5.00	C	
		4	CYBS-404	Electronic Governance Security	أمن الحوكمة الالكترونية	English	2				1		3	48	52	100	4.00	C	
		5	CYBS-405	Cloud Computing Security	أمن الحوسبة السحابية	English	2		2				3	63	62	125	5.00	C	

	6	CYBS-406	Project I	مشروع بحث تخرج (1)	English				2		1	2	47	128	175	7.00	C	
					Total	10	0	6	2	2	1	17	332	418	750	30.0		

UGIV

Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
						CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
Eight	1	CYBS-407	Operating Systems Security	أمن نظم التشغيل	English	2		2				3	63	62	125	5.00	C	
	2	CYBS-408	Web applications Security	أمن تطبيقات الويب	English	2		2				3	63	62	125	5.00	C	
	3	CYBS-409	Digital Forensics	الأدلة الجنائية الرقمية	English	2		2				3	63	62	125	5.00	C	
	4	CYBS-410	Intelligent Analysis of Security Threats	التحليل الذكي للتهديدات الامنية	English	2				1		3	48	52	100	4.00	C	
	5	CYBS-411	Information Risk Management	ادارة مخاطر المعلومات	English	2				1		3	48	52	100	4.00	C	
	6	CYBS-412	Project II	مشروع بحث تخرج (2)	English				2		1	2	47	128	175	7.00	C	
					Total	10	0	6	2	2	1	17	332	418	750	30.0		
					Total	96	0	50	4	25	2	145	2783	3176	6000	240.0		Must be 240 ECTS

Note: The student should complete 4 weeks of Summer Internships to fullfil the requirements of the Bachelor's degree

Structured SWL (hr/w) type		
	CL	Class Lecture
	Lab	Laboratory
	Pr	Practical Training
	Tut	Tutorial
	Lect	Online lecture
	Semn	Seminar

Module type		
	B	Basic learning activities
	C	Core learning activity
	S	Support or related learning activity
	E	Elective learning activity

SWL:	Student Workload
SSWL:	Structured SWL
USSWL:	Unstructured SWL

Note: Columns O, Q and R are progrmaed, protected and should not be edited

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**رياضيات**			**Module Delivery**	
Module Type	**S**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CYBS-105				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	1		**Semester of Delivery**	1	
Administering Department			**College**		
Module Leader			**e-mail**		
Module Leader's Acad. Title	LECTURER		**Module Leader's Qualification**	M.Sc.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	N/A	**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- Understanding basic concepts: Students should develop a solid understanding of fundamental concepts in calculus, such as limits, continuity, derivatives, and integrals. 2- Calculating derivatives: Students should be able to calculate derivatives using various differentiation techniques, including the power rule, chain rule, product rule, quotient rule, and trigonometric derivatives. 3- Applying differentiation: Students should be able to apply differentiation to solve problems related to rates of change, optimization, curve sketching, related rates, and applied problems in various fields. 4- Understanding the Fundamental Theorem of Calculus: Students should comprehend the Fundamental Theorem of Calculus and be able to use it to evaluate definite integrals and find antiderivatives. 5- Solving differential equations: Students should gain an understanding of basic techniques for solving first-order differential equations and solving separable, linear, and homogeneous differential equations. 6- Multivariable calculus: Depending on the level of the course, students may be introduced to multivariable calculus and learn concepts such as partial derivatives, multiple integrals, and vector calculus.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. **study the functions and the domain .** **2. evaluation the range of functions and their drawing.** **3. A study of the limits and Luptal's rule.** **4. A continuity study.** **5. Derivability.** **6. A study of the derivation of the transcendental exponential ,trigonometric and natural logarithm functions.** **7. study the integration with many methods.**
Indicative Contents المحتويات الإرشادية	**<u>Part A – Theoretical lectures</u>**

	Introduction of real numbers, functions and Their types, the Domain and Range of the functions with different techniques for polynomial function , fractional functions. Radical functions (odd and even roots) . [10 hrs] **Limit of a Function and Limit Laws, The Precise Definition of a Limit, One-Sided Limits** **, Limits Involving Infinity, Asymptotes of Graphs [10 hrs]** . **The Derivative at a Point , The Derivative as a Function , Differentiation Rules , The Chain Rule ,Implicit derivative , Partial derivative , (Cauchy-Riemann equation), Laplace equation [15hrs].** **Transcendental functions (the Natural Logarithm) and Logarithm differentiable Logarithmic functions and their Derivatives, Trigonometric functions and their Derivatives , Logarithm with base a , the exponential function , Exponential function of type a^x, a^u and trigonometric function [16 hrs]** **The inverse trigonometric function, Hyperbolic function,. [6hrs].** **Definite integral, Indefinite integral, the integral of Natural logarithms, The integration of exponential functions and Trigonometric functions integrations. [8hrs]** **Integration by part. Integral contain n-th root, Integration of Rational function by partial fractions [10hrs]** **<u>Part B –</u>** **Additional and Advanced Exercises.** [18 hrs] **applications [12 hrs]** **Advanced Exercises and homework's.[40 hrs].**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in the exercises, while improving and expanding their critical thinking skills at the same time. This will be achieved through classes and interactive tutorials and by looking at the types of simple experiments that include some sampling activities that are of interest to the students.** **Mathematics, including calculus, requires practice to reinforce understanding and develop problem-solving skills. Work through a variety of problems, both from your textbook and supplementary resources. Start with simple problems and gradually increase the difficulty level.**

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**75**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	---		Continuous	All
	Report	---		13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	20% (10)	7	LO #1 - #7
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	**Introduction of real numbers, functions and Their types, sketch and the domain.**
Week 2	**The Range of the functions, the Limit.**
Week 3	**The limit of Infinity and properties of Limits ,the Continuity, the derivative.**
Week 4	**Implicit differentiation, The Chain Rule.**
Week 5	**Partial derivative ,theorem (Cauchy-Riemann equation), Laplace equation .**
Week 6	**Transcendental functions (the Natural Logarithm) and Logarithm differentiable, (quiz).**

Week 7	**Logarithm with base a , the exponential function , Exponential function of type a^x, a^u and trigonometric function .**
Week 8	**The inverse trigonometric function**
Week 9	**Hyperbolic function, (quiz)**
Week 10	**Definite integral, Indefinite integral, the integral of Natural logarithms.**
Week 11	**The integration of exponential functions and Trigonometric functions integrations.**
Week 12	**Midterm exam.**
Week 13	**Integration by part.**
Week 14	**Integral contain n-th root , Integration of Rational function by partial fractions.**
Week 15	**Substitution by trigonometric function.**

Delivery Plan (Weekly Lab. Syllabus) N/A المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1- أي. برسل /الجزء الاول /1982 حسبان التفاضل والتكامل مع الهندسة التحليلية /. 2- George B. Thomas, Jr. Massachusetts '' INSTRUCTOR'S SOLUTIONS MANUAL SINGLE VARIABLE '' 3-Calculus 11th Thomas	Yes yes Yes
Recommended Texts	1- د. رمضان محمد جهينة و د.احمد عبد العالي هب الريح التفاضل والتكامل /الجزء الاول /دار الكتاب الجديد المتحدة. 2- ROBERT T. SMITH, ROLAND B. MINTON, '' Calculus Fourth Edition'' 2012	Yes No

Websites	**https:// www.wolframalpha.com .**

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	برمجة (1)			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CYBS-101**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Cybersecurity	**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of programing through the application of instruction. 2. To understand input , output instruction . 3. This course deals with the basic operation in any program code. 4. This is the basic subject for all programs. 5. To understand how to analysis any problem to solve it by programs. 6. To perform a good programmer .
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. Recognize how instruction works in program code. 2. List the various terms of programing. 3. Summarize what is meant by a basic instruction. 4. Discuss the simple programming and the perfect programing . 5. Describe the problem and how to solve it by programing. 6. Identify the basic elements of any program code. 7. Discuss the precedence of operator . 8. Discuss the various of idea to solve any program .
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A - programing Theory Flowcharts, simple sequential flowchart , branched flowchart , Loop flowchart [15 hrs] Identifier names , variables and data types (Integer ,float ,double , char) Input and output statements (cin and cout statements). [15 hrs] Operators (arithmetic ,relational and logical) + , - , * , / , % , > , < , && , || , ! precedence of operator (( ),++,--,*/%,+-,?). [10 hrs]

	The control statements(first type) , Nested control statement. (nested if statement) [15 hrs] Part II (of control statement) Switch …. Case selected [10 hrs] Part B - The control statements(second type) Looping first type , For loop and Nested for loop , Looping second type (While loop and Nested while loop, Looping third type (Do….. while loop) (20 hrs) Statement working with loop (Break , continue). [10 hrs] Functions (Simple functions) . (10 hrs)

Learning and Teaching Strategies
ستراتيجيات التعليم والتعلم

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

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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**	1	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	6	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	6	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 - simple sequential flowchart
Week 2	branched flowchart
Week 3	Identifier names , variables and data types
Week 4	Input and output statements
Week 5	Operators (arithmetic ,relational and logical)
Week 6	precedence of operator
Week 7	The control statements(first type)
Week 8	Nested control statement
Week 9	The control statements(second type)
Week 10	Looping first type
Week 11	Looping second type
Week 12	Looping third type
Week 13	Statement working with loop

Week 14	Functions
Week 15	Simple function
Week 16	Input and output statements

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	Lab 1: Introduction to the language
Week 2	Lab 2: input, output instruction
Week 3	Lab 3: variables and constants, Assignment operator Arithmetic and Logical operators
Week 4	Lab 4: Control Decision (if and switch case)
Week 5	Lab 5: Looping statement (for)
Week 6	Lab 6: Looping statement (while and do while)
Week 7	Lab 7: simple functions

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	C++ from control structures through objects, eighth edition, by Tony Gaddis	no
Recommended Texts		No
Websites		

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

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**مبادئ أمن المعلومات**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CYBS-104**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Cybersecurity		**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. Confidentiality: Ensure that data is accessible only to authorized individuals or entities, protecting it from unauthorized access or disclosure. 2. Integrity: Maintain the accuracy, consistency, and trustworthiness of data by preventing unauthorized modifications, corruption, or tampering. 3. Availability: Ensure that data is accessible and usable by authorized users when needed, avoiding disruptions or downtime that could hinder productivity. 4. Authentication: Verify the identity of individuals or systems accessing data to prevent unauthorized access and protect against identity theft or impersonation. 5. Auditing and Accountability: Establish mechanisms to track and monitor data access, modifications, and user activities, enabling traceability, investigation, and accountability in case of security incidents or breaches.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the key principles and concepts of data security. 2. Identify and assess potential risks to data security. 3. Apply appropriate measures to protect data confidentiality and integrity. 4. Implement authentication and access control mechanisms to ensure authorized data access. 5. Develop strategies for ensuring data availability and preventing downtime or disruptions. 6. Demonstrate knowledge of auditing and accountability practices to track and monitor data access. 7. Comply with legal and regulatory requirements related to data security.
Indicative Contents المحتويات الارشادية	• Threat landscape: Overview of common threats and vulnerabilities in data security. • Risk assessment: Understanding and conducting risk assessments to identify potential security risks. • Encryption and data protection: Exploring encryption techniques and methods to safeguard data. • Access control: Implementing access control mechanisms to regulate data access based on user roles and permissions. • Security policies and procedures: Developing and implementing data security policies and procedures.

	• Incident response: Understanding incident response protocols to effectively address and mitigate data security incidents. • Compliance and legal considerations: Familiarity with relevant regulations and standards pertaining to data security.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	• Defense in depth: Implement multiple layers of security controls to create a comprehensive and resilient defense strategy. • Regular updates and patch management: Keep software and systems up to date with the latest security patches and updates to address known vulnerabilities. • Employee training and awareness: Educate and train employees on data security best practices and the importance of maintaining strong security measures. • Data classification and protection: Classify data based on its sensitivity and apply appropriate protection measures, such as encryption or access controls.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	1
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.	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, Basic Security Concepts
Week 2	(Cryptosystem), Components of the Cryptographic System
Week 3	Encryption Algorithms Traditional Transposition
Week 4	Monoalphabetic Substitution, Cipher Systems
Week 5	Homophonic Substitution Cipher Systems
Week 6	Polyalphabetic Substitution Cipher Systems
Week 7	One-Time Pad and Stream Ciphers
Week 8	Mathematical Background
Week 9	Public key Cryptography and RSA
Week 10	Block Ciphers
Week 11	Security Mechanisms, Authentication
Week 12	Firewall Concept
Week 13	Definitions about Viruses, Hackers, Attacks
Week 14	Network Security
Week 15	**Exam**
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبرات

	Material Covered
Week 1	Language Principles
Week 2	Language Definitions for Cryptosystem
Week 3	Programs for: Transposition Methods
Week 4	Programs for: Monoalphabetic Substitution Methods
Week 5	Programs for: Homophonic Substitution Methods
Week 6	Programs for: Polyalphabetic Substitution Methods
Week 7	Programs for: LFSR and NLFSR
Week 8	Programs for: Prime, GCD, Inverse
Week 9	Programs for: RSA Algorithm Steps
Week 10	Programs for: DES Algorithm Steps
Week 11	Programs for: Authentication Steps
Week 12	Programs for: Some Applications

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Principles of Information Security" by Michael E. Whitman and Herbert J. Mattord (Latest edition - 2018)	Yes
Recommended Texts	"Cryptography and Network Security: Principles and Practice" by William Stallings (Latest edition - 2020)	No
Websites	https://	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	(1) اللغة الانكليزية			**Module Delivery**	
Module Type	S			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CYBS-106				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Cybersecurity		**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. To Develop English skills by listening and writing . 2. Learning English and conversation training 3. Conversations in English in the field of computers (Information Technology). 4. The student receives all the information about the computer and at the same time learns and trains the correct pronunciation in this language. 5. conversations between students about everything related to Information Technology. 6. Obtain English skill support high level of graduate .
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. Learning English and conversation training. 2. Listening and writing in English language. 3. Basic information about Information Technology (IT). 4. Learns and trains the correct pronunciation in this language. 5. Learn and write common sentences in the English language. 6. Learn to write words that end or start with the same syllable in the English language. 7. Learn about job interviews. 8. Learn personal presentation in English language.
Indicative Contents المحتويات الارشادية	**<u>Unit 5:</u> E-commerce companies [8hrs]** E-commerce companies: listening, writing, reading, speaking and vocabulary. E-commerce features: listening, writing, language, speaking and vocabulary. Transaction security: listening, writing, language, speaking and vocabulary. Online transaction: listening, writing, language, speaking and vocabulary. **<u>Unit 6:</u> Network systems [8hrs]** Types of network: describe networks and make recommendations. Networking hardware: listening, writing, language, speaking and vocabulary. Talking about the past: listening, writing, language, speaking and vocabulary. Network range and speed: listening, writing, language, speaking and vocabulary. **<u>Unit 7:</u> IT support [8hrs]** Fault diagnosis: talk about results of an action, language, speaking and vocabulary. Software repair**:** listening, writing, language, speaking and vocabulary.

	Hardware repair: listening, writing, language, speaking and vocabulary. Customer service: explain the use of things. listening, writing and vocabulary. **<u>Unit 8:</u> IT security and safety [8hrs]** Security solutions: listening, writing, language, speaking and vocabulary. Workstation health and safety: listening, writing, language, speaking and vocabulary. Security procedures: listening, writing, language, speaking and vocabulary. Reporting incidents: listening, writing, language, speaking and vocabulary.
Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	The main strategy that will be adopted in the delivery of this units are to encourage students to participate in writing and reading exercises, while improving their listening skills. This will be achieved through student interaction in class and completion of daily assignments (homework).

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects	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	E-commerce companies +listening, speaking and vocabulary. .
Week 2	E-commerce features + listening, writing, language and vocabulary.
Week 3	Transaction security + listening, writing, language and speaking.
Week 4	Online transaction + listening, writing, language, speaking and vocabulary
Week 5	Types of network /describe networks and make recommendations.
Week 6	Networking hardware + listening, writing, language, speaking and vocabulary.
Week 7	Talking about the past + listening, writing, language, speaking and vocabulary.
Week 8	Network range and speed + listening, writing, language, speaking and vocabulary.
Week 9	Fault diagnosis + talk about results of an action, language, speaking and vocabulary.
Week 10	Software repair + listening, writing, language, speaking and vocabulary.
Week 11	Hardware repair + listening, writing, language, speaking and vocabulary.
Week 12	Customer service/ explain the use of things + listening, writing and vocabulary.
Week 13	Security solutions: listening, writing, language, speaking and vocabulary.
Week 14	Workstation health and safety: listening, writing, language, speaking and vocabulary.
Week 15	Security procedures + Reporting incidents/ listening, writing, language, speaking and vocabulary.
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات :لا يوجد عملي نظري فقط	
	Material Covered
Week 1	N. A
Week 2	N. A
Week 3	N. A
Week 4	N. A
Week 5	N. A
Week 6	N. A
Week 7	N. A

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	English for information technology , 1 vocational English, course book, Maja Olejniczak, series editor David Bonamy.	Yes
Recommended Texts		
Websites	https://www.youtube.com/watch?v=WOVu22J_sN8	Book 1 Audio CD

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	**هياكل متقطعة (1)**			**Module Delivery**	
Module Type	**S**			**Theory** ☒ **Lecture** **Lab** ☒ **Tutorial** **Practical** **Seminar**	
Module Code	CYBS-102				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Cybersecurity		**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Assistant prof		**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			**Version Number**		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. The course aims to study discrete structures in terms of the use of algebraic laws. 2. Charts and shapes 3. To reach an easy and clear way for students 4. To solve all material issues related to discontinuous structures. 5. In addition to studying quantifiers and predicates logic 6. Studying the different groups, theories and schemes so that the student can solve the duties required of him and the exercises with simplicity, ease and clarity.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learn how to solve algebraic laws, groups and Venn diagrams correctly, efficiently and clearly 2. The subjects studied in discrete structures are either definite or indefinite. The term finite structures is sometimes used to refer to fields of discrete mathematics that deal with finite groups, 3. especially in fields of business relevance. 4. Discrete mathematical structures have gained wide importance over the recent decades due to their wide applications in computer science. 5. Discrete mathematics terms and notations are useful for studying and expressing problems of objects in computer programming and algorithms. 6. Some branches of discrete mathematics are also useful in studying some business and economic issues.
Indicative Contents المحتويات الارشادية	The course aims to study discontinuous structures in terms of the use of algebraic laws, diagrams and shapes to reach an easy and clear way for students to solve all issues related to the subject of discontinuous structures. In addition to studying quantifiers and predicates logic and studying different groups, theories and schemes so that the student can solve the duties required of him and the exercises with simplicity, ease and clarity.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	

	Discrete structures is the study of mathematical structures that are essentially discontinuous, in the sense that they do not require the presence of the adjective of communication and do not require it in order to study this subject. Most of the topics studied in discrete mathematics are related to countable sets (a completely different concept from finite sets), an example of which is the set of integers. Discrete mathematics has gained wide importance in recent decades due to its wide applications in computer science. Discrete mathematics terms and notations are useful for studying and expressing objects in computer programming and algorithms. Some branches of discrete mathematics are also useful in studying some business and economic issues.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	
	Assignments	2	10% (10)	2 and 12	
	Projects	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	Definition to discrete structure
Week 2	Biconditional statement, Type of statements
Week 3	Algebra of propositions
Week 4	Laws of Algebra propositions
Week 5	Define of Predicates logic
Week 6	Define of quantifiers and examples
Week 7	Sets theory
Week 8	Type of set operation
Week 9	Venn diagram in details
Week 10	Laws of set operation and type
Week 11	Define of Cartesian product
Week 12	types of relations
Week 13	Graphs of relation, construct the relation
Week 14	How to solve laws of relations
Week 15	Other approaches to computability
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبو يع للمختبر

	Material Covered
Week 1	N.A
Week 2	N.A
Week 3	N.A
Week 4	N.A
Week 5	N.A
Week 6	N.A
Week 7	N.A

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Discrete Mathematics and Its Applications_7th_Edition	Yes
Recommended Texts	Foreman, M., Akihiro Kanamori, eds. Handbook of Set Theory. 3 vols., 2010. Each chapter surveys some aspect of contemporary research in set theory. Does not cover established elementary set theory.	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
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	**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	**أساسيات التصميم المنطقي**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CYBS-103				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Cybersecurity		**College**	College of Science	
Module Leader			**e-mail**		
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			**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. Understanding Digital Systems: Learn and understand the core principles of digital systems and how they function. 2. Binary Logic Mastery: Gain a clear understanding of binary logic and how it forms the basis for digital computing and design. 3. Comprehension of Logic Gates: Understand the functioning of basic logic gates (AND, OR, NOT) and more complex gates (NAND, NOR, XOR, XNOR), as well as how to combine these gates to create digital circuits. 4. Boolean Algebra Proficiency: Develop a strong understanding of Boolean algebra, including how to simplify Boolean expressions and how these expressions are used in logic design. 5. Sequential and Combinational Logic: Learn the difference between sequential and combinational logic, and how to design circuits using each type of logic. 6. Logic Minimization Techniques: Understand and apply logic minimization techniques, such as Karnaugh maps and Quine-McCluskey method, to simplify logic designs. 7. Design and Analysis: Gain the ability to design and analyze various types of digital circuits, including adders, multiplexers, decoders, memory units, and more. 8. Understanding of Flip Flops and Memory Elements: Develop a comprehension of various types of flip-flops and memory elements, and understand their use in creating larger systems such as registers and counters. 9. Problem-Solving Skills: Enhance problem-solving skills, critical thinking, and creativity in the context of digital logic design.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding Fundamental Concepts: The students will have a firm grasp of binary systems, digital signals, logic gates, and Boolean algebra. 2. Proficiency in Logic Minimization Techniques: Students will know how to use Karnaugh maps and Quine-McCluskey method to simplify logic circuits. 3. Hands-On Experience: Students will gain practical experience in implementing logic circuits, either physically with electronic components or virtually using design and simulation software. 4. Knowledge of Different Logic Families: Students will learn about different logic families (like TTL, CMOS), their characteristics, and the advantages and disadvantages of each. 5. Design and Analysis of Logic Circuits: Students will be able to design and analyze combinational and sequential circuits. This includes basic gates, adders, multiplexers, decoders, and other digital circuits. 6. Problem-Solving Skills: Students will develop strong problem-solving skills, allowing them to tackle complex logic design problems effectively. 7. Understanding of Memory Elements: Students will understand the operation of different types of flip-flops, latches, and other memory elements. They will

	also know how these elements are used to design registers, counters, and more complex memory structures. 8. Ability to Work in Teams: If collaborative projects are included in the course, students will gain experience in working as part of a team to design and implement complex logic circuits. 9. Relating Theory to Practice: Students will be able to relate theoretical concepts to practical real-world applications, recognizing the significance and utility of logic design in various technological applications. 10. Understanding of Timing Issues: Students will understand timing issues in digital circuits, including setup and hold times for flip-flops, and how to design circuits that meet timing requirements.
Indicative Contents المحتويات الإرشادية	1. Introduction to Digital Systems: Discussion of what digital systems are and how they function, including basics of analog vs digital signals. 2. Binary Systems and Codes: Understanding of binary numbers, binary arithmetic, binary codes like Gray Code, BCD, etc. 3. Logic Gates and Circuits: Introduction to basic logic gates (AND, OR, NOT), universal gates (NAND, NOR), and more complex gates (XOR, XNOR). 4. Boolean Algebra and Logic Simplification: An in-depth look at Boolean algebra, its laws and rules, and its application to logic design. Techniques for logic simplification, such as De Morgan's laws and Karnaugh maps, would also be included. 5. Combinational Logic Circuits: Study of combinational logic design, including adders, subtractors, multiplexers, decoders, and encoders. 6. Sequential Logic Circuits: Discussion of sequential logic, flip-flops, latches, counters, and registers. 7. Memory and Programmable Logic Devices: Examination of memory units, memory organization, and devices like Read-Only Memory (ROM), Programmable Read-Only Memory (PROM), and Programmable Logic Arrays (PLA). 8. Logic Families: Introduction to different logic families like TTL, ECL, and CMOS, and comparison of their characteristics and applications. 9. Finite State Machines: Explanation of the concept of state, state diagrams, state tables, and how to design finite state machines. 10. Introduction to VHDL/Verilog: Basics of hardware description languages, their syntax, and semantics, and how they are used to design and test digital circuits.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Learning and teaching logic design, particularly digital logic design, requires a deep understanding of binary systems, gates, Boolean algebra, and much more. Here are some effective strategies to facilitate learning and teaching of this subject.

	2. Using Visual Tools: Visual representations can greatly enhance understanding in this field. Using diagrams to explain concepts such as truth tables, Karnaugh maps, and logic gates. Software like Circuit maker can be used to virtually design and test digital circuits. 3. Starting with basic binary arithmetic, explaining the importance of 0s and 1s in digital logic design. Moving to basic logic gates (AND, OR, NOT), and gradually introduce more complex ones (NAND, NOR, XOR, XNOR). 4. Utilizing Hands-On Learning: Incorporating practical exercises whenever possible. This could involve using breadboards and basic electronic components or using software to design and simulate circuits. 5. Learning and teaching logic design, particularly digital logic design, requires a deep understanding of binary systems, gates, Boolean algebra, and much more. Here are some effective strategies to facilitate learning and teaching of this subject. 6. Using Visual Tools: Visual representations can greatly enhance understanding in this field. Using diagrams to explain concepts such as truth tables, Karnaugh maps, and logic gates. Software like Circuit maker can be used to virtually design and test digital circuits. 7. Starting with basic binary arithmetic, explaining the importance of 0s and 1s in digital logic design. Moving to basic logic gates (AND, OR, NOT), and gradually introduce more complex ones (NAND, NOR, XOR, XNOR). 8. Utilizing Hands-On Learning: Incorporating practical exercises whenever possible. This could involve using breadboards and basic electronic components or using software to design and simulate circuits.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**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**	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	Numbering systems_1 (Decimal, Binary, Octal and Hexadecimal)
Week 2	Base conversion (Decimal, Binary, Octal and Hexadecimal, Gray, BCD, EX-3, 2421))
Week 3	Arithmetic Operation (Addition, Subtraction: Normal, 1's complement, 2's complement)
Week 4	Arithmetic Operation (Multiplication, Division)
Week 5	Basic logic gates (AND, OR, NOT, NAND, NOR, EXOR, XNOR)
Week 6	Logic circuit simplification using Boolean algebra
Week 7	Logic circuit simplification using Karnaugh map
Week 8	Digital logic design circuits
Week 9	Arithmetic circuits (Adders, Subtractors, Comparator)
Week 10	Decoders, Encoders, Multiplexers, De-Multiplexers
Week 11	Latches and Flip Flops
Week 12	Asynchronous counters, synchronous counters
Week 13	Shift registers (PIPO,SIPO,PISO and SISO)
Week 14	Memory (RAM and ROM)
Week 15	Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Application of Basic logic gates (AND, OR, NOT) and their Truth Table, Boolean Expression, Function
Week 2	Application of Boolean Algebra
Week 3	Application of De-Morgan theorem
Week 4	Application of Combinational Circuits
Week 5	Application of Combinational Circuits simplification using Boolean Algebra
Week 6	Application of Combinational Circuits simplification using Karnaugh map
Week 7	Application of Digital logic design circuits
Week 8	Application of Binary adders (Half-Full adders, Half-Full Subtractor)
Week 9	Application of Decoder, Encoder, Multiplexer, De-Multiplexer
Week 10	Application of Sequential circuits (SR_latch and D_latch)
Week 11	Application of Master-slave flip-flop(SR , JK, D and T)
Week 12	Application of Counters and Registers
Week 13	Application of Memory (Static RAM)
Week 14	Application of Memory (ROM)

Week 15	Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	M. M. Mano,2016, “Digital Design”, Prentice Hall	
Recommended Texts	Thomas l. Floyd, 2006, “Digital Fundamentals”, Prentice Hall	
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	اللغة العربية(1)			**Module Delivery**	
Module Type	S			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOM1011				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		1	**Semester of Delivery**		2
Administering Department		Cybersecurity	**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title		Lecture	**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. **بيان أهمية دراسة اللغة العربية** 2. **وتعلم القراءة الصحيحة والكتابة السليمة**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	أن ينشأ الطالب على حب اللّغة العربيّة ، والتعرّف على مواطن الجمال في اللّغة العربيّة وآدابها ، فضلا عن تعريف الطالب بألفاظ اللّغة العربيّة الصحيحة وتراكيبها وأساليبها السليمة بطريقة مشوقة وجذابة. وأن يكتسب القدرة على استعمال اللغة استعمالًا صحيحاً في الاتّصال مع الآخرين مع اتقان جودة الالقاء وحسن التعبير .اللغة العربية لغة البيان، التي تحمل العديد من العبارات والدلالات التي تميزها عن اللغات الأخرى، فهي لسان العقل البليغ، وحكمة اللسان العاجز، فاللغة العربية هي لغة الضاد حيث أنها مستودع قوي لجميع مصطلحات العالم تضم بداخلها العديد والعديد من المعاني، حيث أن سعة اللغة العربية شاسعة وتحمل الكثير من محاسن الألفاظ، واللسان المعرب هو الأفضل والأسمى دائماً، فالقرآن عربي والحضارة عربية، وهي اللغة الغنية التي تصل إلى مستوى الكمال
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A** - أهمية اللغة نشأة علوم اللغة العربية [15 hrs] **Part** B-الافعال الفعل الماضي، الفعل المضارع،فعل الامر،الافعال اللازمة ، والافعال المتعدية لمفعول ، الافعال المتعدية لمفعولين[20 hrs] **Part c** - اعراب المبتدأ والخبر المبتدأ والخبر، دخول كان واخواتها على المبتدأ والخبر ، دخول ان واخواتها على المبتدأ والخبر [20 hrs] **Part D- الترقيم والاخطاء الشائعة**[5 hrs]

	Part E-المنصوبات المفعول به، المفعول لأجله، المفعول المطلق[10hrs] **Part F قواعد العدد** [10 hrs]التانيث والتذكير في العدد والجمع والمثنى في العدد [5 hrs]نص **Part G**شعري للجواهري

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1

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

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	0	0% (0)	Continuou s	All
	Report	2	20% (20)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	1hr	10% (10)	7	LO #1 - #7
	Final Exam	2hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**أهمية اللغة العربية ونشأة علوم اللغة العربية**
Week 2	**الأفعال**
Week 3	**المبتدأ والخبر**

Week 4	النواسخ : كان واخواتها
Week 5	ان واخواتها
Week 6	علامات الترقيم
Week 7	أخطاء لغوية شائعة
Week 8	المنصوبات
Week G	المفعول به
Week 10	المفعول لأجله
Week 11	المفعول لأجله
Week 12	المفعول المطلق
Week 13	قواعد العدد
Week 14	قواعد العدد
Week 15	نص شعري للجواهري

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	None
Week 2	None

Week 3	None
Week 4	None
Week 5	None
Week 6	None
Week 7	None

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**مجموعة من المؤلفين /اللغة العربية لأقسام غير الاختصاص**	Yes
Recommended Texts	**كتب النحو /كتب الاملاء/المنهاج في القواعد والإعراب**	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 – 4G)	**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	**الاحتمالات والإحصاء**			**Module Delivery**	
Module Type	S			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CYBS-111**				
ECTS Credits	3				
SWL (hr/sem)	**75**				
Module Level	**1**		**Semester of Delivery**	2	
Administering Department	Cybersecurity		**College**	College of Science	
Module Leader			**e-mail**	E-mail :	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**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		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. The student takes basic information in the principles of statistics. 2. Know the types of statistics as well as the types of variables and algebraic operations using statistical symbols. 3. The student should take a simplified idea of methods for data collection, tabulation and summary in a way that can be used in a way that fits with his field of specialization, in addition to having skills in the data processing process using a set of statistical measures. 4. Knowledge of the most important measures of central tendency and measures of dispersion and methods of calculating them in the case of tabulated and ungrouped data. 5. The student takes basic information about probability theory. 6. Know the types of accidents in probability theory in terms of the possibility of occurrence. 7. Knowing the types of accidents in probability theory in terms of the possibility of occurrence and performing operations on groups (Venn diagram, equality and difference, union and intersection, complementary groups, group algebra, De Morkan's law).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introducing the basic terms of statistics. 2. Know the importance of statistics and its application in all fields of life. 3. The ability to deal with the sample, its concept, methods of sample collection and analysis, and drawing conclusions. 4. The ability to tabulate data and put it into a frequency distribution table 5. The ability to interpret figures and graphs and extract information from them. 6. The ability to calculate measures of central tendency and measures of dispersion and interpret their values. 7. The ability to deal with various incidents of probability theory and to calculate the mathematical relationships between groups.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Basic concepts in statistics, dealing with various variables, and performing algebraic operations using statistical symbols. [5 hours] Part B - Presenting the data in a frequency distribution table, finding the number of categories and frequencies for each category, calculating the relative frequency and the cumulative ascending and descending frequency, and representing the frequency tables with graphs and interpreting their results. [5 hours.]

	Part C - Use measures of central tendency and measures of dispersion for classified and ungrouped data and explain the values of each. [10 hours.] Part D - The use of probability theory to show potential, non-probable, certain and impossible events, and to indicate the type of relationships between probabilistic groups. [10 hours.]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Encourage students' participation in the exercises, while at the same time refining and expanding their Practical thinking skills. This will be achieved through classes, assignments, quizzes, and projects.

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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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**	3	15 % (15)	5,9 and 12	LO #1,#2,#3,#4,#5and#6
	Assignments	5	15% (15)	3,6,9,11 and 14	LO #1,#2,#3,#4,#5,#6 and #7
	Projects / Lab.	-	10% (10)	-	-
	Report	1	10% (10)	12	all
Summative assessment	**Midterm Exam**	2hr	10% (10)	11	all
	Final Exam	3hr	50% (50)	16	all

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Concept of statistics, types of statistics, importance of statistics, nature of data, types of variables, population and sample, statistical symbols, mathematical examples
Week 2	Data tabular display, frequency distribution, total range of distribution, number of classes, class length, lower and upper limit, class center, class frequency
Week 3	Tabulation of data for discrete variables, for example, tabulation of data for continuous variables, relative frequency distribution
Week 4	Clustered frequency distribution, ascending clustered frequency distribution table, descending clustered frequency distribution table
Week 5	Double frequency distribution table, example, graphs, graphs for grouped and ungrouped data, histograms
Week 6	Frequency polygon, frequency curve, agglomeration, ascending agglomeration, descending agglomeration
Week 7	Measures of central tendency, the arithmetic mean, the calculation of the arithmetic mean from ungrouped data, the direct method, the reduced method (the method of deviations)
Week 8	Calculating the arithmetic mean from grouped data, the direct method, the reductive method, and the method of deviations divided by class length
Week 9	The weighted arithmetic mean, the characteristics of the arithmetic mean, the advantages of the arithmetic mean, and the disadvantages of the arithmetic mean
Week 10	Harmonic mean, calculating the harmonic mean from ungrouped data, calculating the harmonic mean from tabulated data, advantages and disadvantages of the harmonic mean
Week 11	Median, calculating median from ungrouped data, calculating median from grouped data (continuous variable, discrete variable), advantages and disadvantages
Week 12	Mode, calculation of mode from ungrouped data, calculation of mode from grouped data, class center method, moment method, difference method, relationship between some measures of central tendency

Week 13	Measures of dispersion, definition of dispersion and its purpose, range, mean deviation, variance and standard deviation, relationship between standard deviation and mean deviation, advantages of standard deviation, disadvantages of standard deviation
Week 14	Probability theory, introduction, certain events, events that are not impossible, possible events (uncertain), the beginnings of set theory, basic definitions,
Week 15	Operations of groups, Venn diagram, equality and difference, union and intersection, complement groups, algebra of groups, De Moorcan's law, classic definition
Week 16	**Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**الصفاوي، صفاء يونس (2008)" الاحصاء " ، وزارة التعليم العالي والبحث العلمي، جامعة الموصل - العراق.**	Yas
Recommended Texts	**الراوي، خاشع محمود (1984)" المدخل الى الاحصاء " الطبعة الاولى، مديرية دار الكتب للطباعة والنشر، جامعة الموصل - العراق.** **ذنون، باسل يونس (2007) "الاحتمالية والمتغيرات العشوائية"، وزارة التعليم العالي والبحث العلمي، جامعة الموصل - العراق.**	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	هياكل متقطعة (2)			**Module Delivery**	
Module Type	S			☒ **Theory** ☒ **Lecture** **Lab** ☒ **Tutorial** **Practical** **Seminar**	
Module Code	CYBS-110				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		1	**Semester of Delivery**		2
Administering Department		Cybersecurity	**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	7. The course aims to study discrete structures in terms of the use of algebraic laws. 8. Studying the Graphs and Trees 9. To reach an easy and clear way for students 10. To solve all material issues related to discontinuous structures. 11. In addition to studying quantifiers and predicates logic 12. Studying the different groups, theories and schemes so that the student can solve the duties required of him and the exercises with simplicity, ease and clarity.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	7. Learn how to solve algebraic laws, groups and Venn diagrams correctly, efficiently and clearly 8. The subjects studied in discrete structures are either definite or indefinite. The term finite structures is sometimes used to refer to fields of discrete mathematics that deal with finite groups, 9. especially in fields of business relevance. 10. Discrete mathematical structures have gained wide importance over the recent decades due to their wide applications in computer science. 11. Discrete mathematics terms and notations are useful for studying and expressing problems of objects in computer programming and algorithms. 12. Some branches of discrete mathematics are also useful in studying some business and economic issues.
Indicative Contents المحتويات الارشادية	The course aims to study discontinuous structures in terms of the use of algebraic laws, diagrams and shapes to reach an easy and clear way for students to solve all issues related to the subject of discontinuous structures. In addition to studying quantifiers and predicates logic and studying different groups, theories and schemes so that the student can solve the duties required of him and the exercises with simplicity, ease and clarity.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	

	Discrete structures is the study of mathematical structures that are essentially discontinuous, in the sense that they do not require the presence of the adjective of communication and do not require it in order to study this subject. Most of the topics studied in discrete mathematics are related to countable sets (a completely different concept from finite sets), an example of which is the set of integers. Discrete mathematics has gained wide importance in recent decades due to its wide applications in computer science. Discrete mathematics terms and notations are useful for studying and expressing objects in computer programming and algorithms. Some branches of discrete mathematics are also useful in studying some business and economic issues.

Student Workload (SWL)

الحمل الدرا يس للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO : 1,4
	Assignments	2	10% (10)	2 and 12	LO : 1,2,5
	Projects				
	Report	2	20% (20)	6,12	1,2,3,4,5,6
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	Definition of proofs
Week 2	Ordered structures
Week 3	Introduction to trees
Week 4	Tree traversal
Week 5	Relations
Week 6	Functions
Week 7	Map function
Week 8	Definition of strings
Week 9	Definition of lists
Week 10	Simple Ciphers
Week 11	Hash function
Week 12	Introduction to Bijection
Week 13	review of previous subjects and Mid-semester exam
Week 14	Geometric and Logical model
Week 15	Semigroup
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	N.A
Week 2	N.A
Week 3	N.A
Week 4	N.A
Week 5	N.A
Week 6	N.A

Week 7	N.A

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Discrete Mathematics and Its Applications_7th_Edition	Yes
Recommended Texts	Foreman, M., Akihiro Kanamori, eds. Handbook of Set Theory. 3 vols., 2010. Each chapter surveys some aspect of contemporary research in set theory. Does not cover established elementary set theory.	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
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Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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	مقدمـــــة في الأمن السيبراني			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CYBS-109**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Cybersecurity		**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. The roles ad influences of governments, commercial and other organizations, citizens and criminals in cybersecurity affairs. 2. Issues surrounding privacy and anonymity 3. he importance of taking a multi-disciplinary approach to cybersecurity 4. he potentialities and challenges of emerging block chain technology to enhance inter-organization trust and data/processing integrity This is the basic subject for all programs. 5. The cyber threat landscape, both in terms of recent emergent issues and those issues which recur over time 6. General principles and strategies that can be applied to systems to make them more robust to attack 7. Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. General principles and strategies that can be applied to systems to make them more robust to attack
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Protect and defend computer systems and networks from cybersecurity attacks. ... 2- Diagnose and investigate cybersecurity events or crimes related to computer systems and digital evidence. ... 3- Effectively communicate in a professional setting to address information security issues.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A –: Introduction to Cybersecurity and Security Fundamentals Overview of cybersecurity and its importance Basic security concepts and principles Threat modeling, [20 hrs] Part B – Network Security Network security fundamentals, including firewalls, intrusion detection, andpreventiosystems Encryption and decryption techniques Virtual Private Networks (VPNs) [20 hrs] Part C – Cryptography Access Control and Authentication Security Management and Risk Assessment [15 hrs] Part D- structures: Definition of structures , read structurer , write structures, examples, Definition of nested structure , examples [20 hrs]

	Part E - Web Security and Applications Mobile Security, Cloud Security Part F-ncident Response and Recovery ncident response planning and management, Disaster recovery and business continuity planning, Cybersecurity incident investigations

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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**	1	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	9	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	0	0% (0)	Continuous	All
	Report	15	15% (15)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	15% (15)	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 Cybersecurity (Overview, Definitions, and Terminology)
Week 2	Cyber Threats, Attacks, and Actors (Types and Examples)
Week 3	Cybersecurity Risk Management (Identification, Assessment, and Control)
Week 4	Cyber Defense Strategies (Prevention, Detection, and Response)
Week 5	Cryptography (Principles, Techniques, and Applications)
Week 6	Cybercrime Investigations and Forensics (Tools, Procedures, and Techniques)
Week 7	Network Security (Protocols, Devices, and Services)
Week 8	Operating System Security (Threats, Vulnerabilities, and Patches)
Week 9	Web Security (Threats, Configurations, and Best Practices)
Week 10	Cloud Security (Deployment Models, Risks, and Controls)
Week 11	Mobile Security (Threats, Platform, and App Security)
Week 12	Social Engineering (Phishing, Scams, and Deception)
Week 13	Ethics and Legal Issues in Cybersecurity (Privacy, Intellectual Property, and Liability)
Week 14	Emerging Trends in Cybersecurity (Artificial Intelligence, Internet of Things, and Blockchain)
Week 15	Review
Week 16	Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	None
Week 2	None
Week 3	None
Week 4	None
Week 5	None
Week 6	None
Week 7	None

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Graham, J., Howard, R. and Olson, R. (2011). *Cybersecurity Essentials*. CRC Press 2. Andress, J. (2013). *Cyber Warfare: Techniques, Tactics and Tools for Security Practitioners*. Syngress. 3. Clarke, R.A. (2012). *Cyber War: The Next Threat to National Security and What to Do about it*. ECCO Press.	No
Recommended Texts		No
Websites		

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

(0 – 49)	**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	**تنظيم الحاسوب**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CYBS-108				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Cybersecurity		**College**	College of Science	
Module Leader			**e-mail**		
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			**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. Understanding Computer Architecture: o Gain a comprehensive understanding of computer organization and architecture principles. o Understand the components and their interconnections in a computer system. 2. Data Representation and Arithmetic: o Learn various number systems and their conversions (binary, decimal, hexadecimal). o Understand how data is represented and manipulated in a computer system. o Perform arithmetic operations on binary numbers. 3. Memory Systems: o Understand the organization and hierarchy of computer memory systems. o Learn about caching techniques and their impact on performance. o Study memory management and addressing techniques. 4. Instruction Set Architecture (ISA): o Learn about different instruction set architectures and their characteristics. o Understand the components and execution of instructions. o Analyze the relationship between ISA and machine language. 5. Processor Organization: o Understand the structure and components of a processor. o Learn about instruction pipelining and its benefits and challenges. o Study the design and implementation of control units. 6. Input/Output (I/O) Systems: o Learn about different I/O devices and their interfaces. o Understand the techniques used for I/O data transfer. o Study interrupt handling and DMA (Direct Memory Access). 7. Parallel Processing and Multiprocessor Systems: o Understand the concepts of parallel processing and its benefits. o Study different parallel processing architectures and their characteristics. o Learn about multiprocessor systems and their organization. 8. Performance Evaluation and Optimization: o Learn performance metrics and evaluation techniques for computer systems. o Understand the factors affecting computer system performance. o Study optimization techniques to improve system performance.

	9. Emerging Trends and Technologies: o Explore current and emerging trends in computer organization. o Study new technologies and their impact on computer systems. o Understand the challenges and opportunities in designing future computer architectures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamental principles of computer organization and architecture, including the components and their interactions within a computer system. 2. Demonstrate knowledge and proficiency in various number systems, data representation, and arithmetic operations in a computer system. 3. Analyze and evaluate different memory systems, including cache memory and main memory, and understand their impact on computer performance. 4. Describe and interpret different instruction set architectures (ISAs), including their components, instruction formats, and execution. 5. Analyze and evaluate the design and organization of processors, including pipelining techniques and control unit implementation. 6. Understand the principles and techniques of input/output (I/O) systems, including I/O devices, interfaces, interrupts, and direct memory access (DMA). 7. Discuss and evaluate parallel processing and multiprocessor systems, including concepts of parallelism, parallel architectures, and interconnectivity. 8. Apply performance evaluation techniques to measure and analyze the performance of computer systems, and propose optimization strategies for improving system performance. 9. Stay informed about current and emerging trends and technologies in computer organization, and assess their potential impact on future computer architectures. 10. Demonstrate effective problem-solving, critical thinking, and analytical skills in the context of computer organization and architecture. 11. Communicate effectively, both orally and in writing, about complex concepts and topics related to computer organization. **12.** Work collaboratively and contribute effectively as a team member in group projects and activities related to computer organization.
Indicative Contents المحتويات الإرشادية	1. Introduction to Computer Organization: o Basic concepts and terminology in computer organization. o Historical development and evolution of computer architecture. 2. Digital Logic and Boolean Algebra: o Binary representation and arithmetic operations. o Logic gates, Boolean functions, and truth tables. o Combinational and sequential logic circuits. 3. Data Representation and Arithmetic:

	○ Number systems: binary, decimal, hexadecimal. ○ Signed and unsigned integer representation. ○ Floating-point representation and arithmetic operations. 4. Central Processing Unit (CPU): ○ Instruction set architecture (ISA) and machine language. ○ CPU organization and components. ○ Control unit, instruction fetching, and execution. 5. Memory Systems: ○ Memory hierarchy and storage technologies. ○ Cache memory organization, principles, and mapping techniques. ○ Main memory organization and addressing modes. ○ Virtual memory concepts and techniques. 6. Input/Output (I/O) Systems: ○ I/O devices, interfaces, and data transfer methods. ○ Interrupt handling and interrupt-driven I/O. ○ Direct Memory Access (DMA) and its role in data transfer. 7. Pipeline Processing: ○ Instruction pipelining concepts and stages. ○ Hazards and techniques for hazard detection and resolution. ○ Performance metrics and improvements in pipeline processing. 8. Parallel Processing and Multiprocessor Systems: ○ Concepts of parallel processing and its benefits. ○ Types of parallel architectures: SIMD, MIMD, and multicore. ○ Interconnection networks and communication among processors. 9. Performance Evaluation and Optimization: ○ Performance metrics and measurement techniques. ○ Bottleneck identification and performance analysis. ○ Techniques for optimizing computer system performance. 10. Emerging Trends and Advanced Topics: ○ Advanced topics in computer organization, such as superscalar processors, out-of-order execution, and speculative execution. ○ Emerging technologies and their impact on computer organization, such as quantum computing and neuromorphic computing.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Understand the Fundamentals: ○ Start by grasping the foundational concepts and principles of computer organization, such as binary representation, digital logic, and Boolean algebra.

	- Build a strong understanding of number systems, data representation, and arithmetic operations used in computer systems. 2. Visualize and Diagram: - Use visual aids, diagrams, and flowcharts to represent and understand the structure and organization of computer components. - Draw diagrams to illustrate the flow of data and control signals within a computer system, such as the CPU, memory, and I/O devices. 3. Hands-on Experience: - Gain practical experience by working with computer hardware and software. This can involve assembling computers, configuring components, or writing low-level programs. - Experiment with simulators or emulators to observe how instructions are executed and how data flows through different computer components. 4. Relate to Real-World Examples: - Relate the concepts of computer organization to real-world examples and applications. Understand how the principles of computer organization are applied in everyday computing devices. 5. Analyze and Evaluate Case Studies: - Study and analyze case studies of actual computer architectures and designs. - Examine the trade-offs made in the design of different computer systems, considering factors such as performance, power consumption, and cost. 6. Solve Practice Problems: - Practice solving problems related to computer organization. This could involve analyzing and designing digital circuits, writing assembly language programs, or optimizing system performance. 7. Stay Updated with Current Research: - Keep up-to-date with the latest advancements and research in computer organization. - Read academic papers, attend conferences, and follow industry trends to understand emerging technologies and new approaches to computer organization. 8. Collaborate and Discuss: - Engage in discussions and collaborate with peers or study groups. Share knowledge, exchange ideas, and clarify concepts through group discussions or online forums. 9. Seek Guidance and Resources: - Consult textbooks, online resources, and academic materials that cover computer organization.

	○ Seek guidance from instructors, tutors, or professionals with expertise in computer architecture and organization. 10. Practice Conceptual Mapping: ○ Develop a conceptual map or framework to connect the different topics and components of computer organization. ○ Understand how the various concepts and components fit together to form a cohesive computer system.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**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**	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 to Computer Organization, Overview of computer systems and their components
Week 2	Digital Logic and Boolean Algebra,
Week 3	Data Representation and Arithmetic
Week 4	Central Processing Unit (CPU)
Week 5	Instruction set architecture (ISA) and machine language
Week 6	CPU organization and components
Week 7	Control unit and instruction execution
Week 8	Memory Hierarchy
Week 9	Memory organization and addressing
Week 10	Cache memory: principles, levels, and mapping techniques

Week 11	Input/Output Systems, Interrupts and DMA (Direct Memory Access), I/O performance and strategies
Week 12	Pipelining and Superscalar Techniques
Week 13	Multiprocessors and Parallel Computer Architecture
Week 14	Performance Evaluation and Benchmarking
Week 15	Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	8086 system archetecture
Week 2	8086 Instruction Set-1
Week 3	8086 Instruction Set-2
Week 4	8086 Instruction Set-3
Week 5	8086 Instruction Set-4
Week 6	8086 Instruction Set-5
Week 7	8086 Addressing Mode

Week 8	Memories (RAM, ROM)
Week 9	Cache Memory
Week 10	8086 Programming Skills
Week 11	8086 Programming Skills
Week 12	8086 I/O unit
Week 13	Memory Mapped I/O, Isolated Input Output
Week 14	Memory/Input Output Interface
Week 15	Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Hwang K., 1993, "Advanced Computer Architecture: Parallelism ,Scalability and Programmability", *McGraw-Hill, Inc. ASIN: 7111067126.*	
Recommended Texts	Barry B. Brey, "The Intel Microprocessors: 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, and Pentium Pro Processor Architecture, Programming, and Interfacing", Pearson Education, 2010	
Websites	https://www.javatpoint.com/8086-microprocessor https://www.tutorialspoint.com/microprocessor/microprocessor_8086_functional_units.h tm	

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	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	**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	البرمجة المتقدمة		**Module Delivery**		
Module Type	**Core**		☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**		
Module Code	CYBS-107				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Cybersecurity		**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الاخرى			
Prerequisite module	Algorithms and structure programing with c++ 1	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of programing through the application of instruction. 2. To understand input , output instruction . 3. This course deals with the basic operation in any program code. 4. This is the basic subject for all programs. 5. To understand how to analysis any problem to solve it by programs. 6. To perform a good programmer .
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. Recognize how instruction works in program code. 2. List the various terms of programing. 3. Summarize what is meant by a basic instruction. 4. Discuss the simple programming and the perfect programing . 5. Describe the problem and how to solve it by programing. 6. Identify the basic elements of any program code. 7. Discuss the precedence of operator . 8. Discuss the various of idea to solve any program .
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Part A – function : Definition of functions , examples , Definition of default argument , Definition of recursive functions , Definition of call by reference functions , [20 hrs] Part B – arrays : Definition of 1D , examples , Definition of 2D, main and second diagonal , examples [20 hrs] Part C – string : Definition of string ,read and write string, Definition of string function , examples [15 hrs] Part D- structures: Definition of structures , read structurer , write structures, examples, Definition of nested structure , examples [20 hrs] Part E - files : Definition files , Open files , closing filse , rewind , Fgetc, fputc functions, examples , Fgets , fputs function , examplies , Fread and fwrite with arraye and structures [20 hrs]

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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**	1	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	9	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	15	15% (15)	Continuous	All

	Report	0	0% (0)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	15% (15)	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	Default argument function
Week 3	Recursive function
Week 4	Call by reference function
Week 5	one Dimensional Array
Week 6	Two Dimensional Array
Week 7	Function to manipulate Arrays
Week 8	String of characters
Week 9	Function to manipulate strings
Week 10	Structures
Week 11	Array of structures
Week 12	Nested structure
Week 13	Files
Week 14	Files working with characters
Week 15	Files working with string, Fread and fwrite instruction
Week 16	Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبو يع للمختبر

	Material Covered
Week 1	Lab 1: apply Default argument function , Recursive function
Week 2	Lab 2: apply Call by reference function
Week 3	Lab 3: apply one Dimensional Array , Two Dimensional Array
Week 4	Lab 4: apply Function to manipulate Arrays
Week 5	Lab 5: apply String of characters , Function to manipulate strings
Week 6	Lab 6: apply Structures , Array of structures , Nested structure
Week 7	Lab 7: apply Files working with characters , Files working with string , fread and fwrite

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	C++ from control structures through objects, eighth edition , by Tony Gaddis	No
Recommended Texts		No
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 – 100	Outstanding Performance
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Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**اللغة الانكليزية(2)**			**Module Delivery**	
Module Type	**S**			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOM2022				
ECTS Credits	2				
SWL (hr/sem)	**50**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Cybersecurity		**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	7. To Develop English skills by listening and writing. 8. Learning English and conversation training 9. Conversations in English in the field of computers (Information Technology). 10. The student receives all the information about the computer and at the same time learns and trains the correct pronunciation in this language. 11. conversations between students about everything related to Information Technology.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**Important:** Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 9. Learning English and conversation training. 10. Listening and writing in English language. 11. Basic information about Information Technology (IT). 12. Learns and trains the correct pronunciation in this language. 13. Learn and write common sentences in the English language. 14. Learn to write words that end or start with the same syllable in the English language. 15. Learn about job interviews. 16. Learn personal presentation in English language.
Indicative Contents المحتويات الارشادية	**<u>Unit 5:</u> E-commerce companies [8hrs]** E-commerce companies: listening, writing, reading, speaking and vocabulary. E-commerce features: listening, writing, language, speaking and vocabulary. Transaction security: listening, writing, language, speaking and vocabulary. Online transaction: listening, writing, language, speaking and vocabulary. **<u>Unit 6:</u> Network systems [8hrs]** Types of network: describe networks and make recommendations. Networking hardware: listening, writing, language, speaking and vocabulary. Talking about the past: listening, writing, language, speaking and vocabulary. Network range and speed: listening, writing, language, speaking and vocabulary. **<u>Unit 7:</u> IT support [8hrs]** Fault diagnosis: talk about results of an action, language, speaking and vocabulary. Software repair**:** listening, writing, language, speaking and vocabulary. Hardware repair: listening, writing, language, speaking and vocabulary.

	Customer service: explain the use of things. listening, writing and vocabulary. **<u>Unit 8:</u> IT security and safety [8hrs]** Security solutions: listening, writing, language, speaking and vocabulary. Workstation health and safety: listening, writing, language, speaking and vocabulary. Security procedures: listening, writing, language, speaking and vocabulary. Reporting incidents: listening, writing, language, speaking and vocabulary.
Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	The main strategy that will be adopted in the delivery of this units are to encourage students to participate in writing and reading exercises, while improving their listening skills. This will be achieved through student interaction in class and completion of daily assignments (homework).

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	E-commerce companies +listening, speaking and vocabulary. .
Week 2	E-commerce features + listening, writing, language and vocabulary.
Week 3	Transaction security + listening, writing, language and speaking.
Week 4	Online transaction + listening, writing, language, speaking and vocabulary
Week 5	Types of network /describe networks and make recommendations.
Week 6	Networking hardware + listening, writing, language, speaking and vocabulary.
Week 7	Talking about the past + listening, writing, language, speaking and vocabulary.
Week 8	Network range and speed + listening, writing, language, speaking and vocabulary.
Week 9	Fault diagnosis + talk about results of an action, language, speaking and vocabulary.
Week 10	Software repair + listening, writing, language, speaking and vocabulary.
Week 11	Hardware repair + listening, writing, language, speaking and vocabulary.
Week 12	Customer service/ explain the use of things + listening, writing and vocabulary.
Week 13	Security solutions: listening, writing, language, speaking and vocabulary.
Week 14	Workstation health and safety: listening, writing, language, speaking and vocabulary.
Week 15	Security procedures + Reporting incidents/ listening, writing, language, speaking and vocabulary.
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبرات :لا يوجد عملي نظري فقط	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	English for information technology , 1 vocational English, course book, Maja Olejniczak, series editor David Bonamy.	Yes
Recommended Texts		
Websites	https://www.youtube.com/watch?v=WOVu22J_sN8	Book 1 Audio CD

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	التشفير			**Module Delivery**	
Module Type	C			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CYBS-205				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Cybersecurity		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	Teaching students: 1- Learn about cryptography and related algorithms (old and new) 2- In addition to the mathematical principles of cryptography 3- Cryptography is the practice and study of techniques used to secure communication and protect information from unauthorized access or modification.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After this course you will be able to 1. The student knows the concepts of codes and ciphers and the objectives of data security 2. Teaching the student ancient and modern encryption algorithms, both symmetric and asymmetric 3. The ability to implement and program different methods and build new systems 4. Familiarize students with the basics of analyzing and breaking ciphers
Indicative Contents المحتويات الارشادية	Confidentiality: The primary objective of cryptography is to ensure the confidentiality of information. This means that only authorized individuals or entities should be able to access and understand the information. Cryptographic techniques such as encryption can be used to transform data into an unreadable form, making it secure even if it falls into the wrong hands. [8 hrs] Integrity: Cryptography aims to maintain the integrity of data, ensuring that it remains unchanged during storage or transmission. Cryptographic mechanisms like digital signatures and hash functions can be used to verify the integrity of data, detecting any unauthorized modifications or tampering. Authentication: Cryptography provides mechanisms for verifying the authenticity of data, messages, or participants in a communication. Through techniques like digital certificates, public-key infrastructure (PKI), and digital signatures, cryptography can ensure that the sender and receiver of information can trust each other's identity and integrity.. [8hrs]

	Non-repudiation: Non-repudiation is the property that prevents individuals from denying their involvement in a communication or transaction. Cryptographic techniques like digital signatures provide evidence of the origin of a message, making it difficult for the sender to later deny sending it. Key Management: Cryptography involves managing cryptographic keys, which are essential for encryption, decryption, and other cryptographic operations. Key management aims to ensure the secure generation, distribution. [8 hrs]

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	Cryptography is the practice and study of techniques used to secure communication and protect information from unauthorized access or modification. The objectives of cryptography can vary depending on the specific context and goals.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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**	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, Terms and Basic Concepts
Week 2	Classical Encryption Techniques (Transposition) & (Substitution)
Week 3	Modern Encryption Techniques
Week 4	Symmetric Crypto Primitives
Week 5	Stream Ciphers
Week 6	Introduction to Number Theory
Week 7	Principles of Public key Cryptography and Cryptosystem
Week 8	Public key Cryptography and RSA
Week 9	The RSA algorithm
Week 10	Block Ciphers
Week 11	Data Encryption Standard, DES
Week 12	Authentication Messages and Requirements
Week 13	Hash Functions
Week 14	Digital Signature
Week 15	Review
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	Lab1: The Programming Language is C#
Week 2	Lab2: Steps for an old methods
Week 3	Lab3: Steps for an some modern methods
Week 4	Lab4: Starts to work with Symmetric methods
Week 5	Lab5: Build programs for some stream cipher's methods
Week 6	Lab6: Build programs for some mathematical methods
Week 7	Lab7: Programming RSA method
Week 8	Lab8: Programming DES method
Week9	Lab9: Apply some methods for Authentication
Week10	Lab10: Apply some methods for Hash function
Week11	Lab11: Apply some methods for Digital signature

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Cryptography and Network Security: Principles and Practice" , (2nd Ed.), William Stallings, Prentice-Hall, Inc., 1999	Yes
Recommended Texts	"Cryptography and Network Security: Principles and Practice", (7th Ed.) , William Stallings , Prentice-Hall, Inc., 2016 "Computation, Cryptography, and Network Security" (1st ed.), Nicholas J. Daras & Michael Th. Rassias, Springer, 2015	Yes
Websites	https://blog.rsisecurity.com/what-is-cryptography-in-cyber-security/	

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	**أساسيات قواعد البيانات**			**Module Delivery**	
Module Type	**B**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CYBS-204**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	1	
Administering Department			**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. To know the benefits of database systems. 2. To understand general database concepts. 3. To be able to analyze the business rules. 4. To know how to design database systems using E-R diagrams. 5. To understand all E-R diagrams concepts. 6. To implement database operations using SQL language
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. Know the differences between file systems and database systems. 2. List the database systems benefits. 3. Define all database basic concepts. 4. Understand the business rules and its role in database design. 5. Know E-R diagram concepts. 6. Define entity, attributes and relationships. 7. Convert the business rule to E-R diagram. 8. Understand supertype/subtype concepts . 9. Draw E-E-R diagrams.
Indicative Contents المحتويات الارشادية	When it comes to working with databases, having a clear strategy is crucial for ensuring efficiency, data integrity, and scalability.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem)	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4

الحمل الدراسي المنتظم للطالب خلال الفصل			
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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)	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	Basic Concepts and Definitions
Week 2	Traditional File Processing Systems
Week 3	The Database Approach
Week 4	Data Modeling
Week 5	Modeling Entities
Week 6	Modeling Attributes
Week 7	Modeling Relationships
Week 8	Degree of A Relationship
Week 9	Cardinality Constraints

Week 10	Other Subjects about Modeling Relationships
Week 11	The Enhanced E-R Model
Week 12	Representing Specialization and Generalization
Week 13	Specifying Constraints in Supertype/Subtype Relationships
Week 14	Defining Supertype/Subtype Hierarchies
Week 15	Case Study
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	Lab 1: Introduction to SQL
Week 2	Lab 2: Tables
Week 3	Lab 3: Data types
Week 4	Lab 4: Create tables
Week 5	Lab 5: Insert command
Week 6	Lab 6: Update command
Week 7	Lab 7: Delete and Drop command
Week 8	Lab 8: Examples
Week 9	Lab 9: Select command
Week 10	Lab 10: Select command with where
Week 11	Lab 11: Select command and IN, like
Week 12	Lab 12: Select command and Between
Week 13	Lab 13: Type of join
Week 14	Lab 14: Inner join
Week 15	Lab 15: Left , right join

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

Required Texts	Modern Database Management, Jeffrey A. Hoffer, Twelfth Edition SQL complete references	NO
Recommended 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	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	النظرية الاحتسابية			**Module Delivery**	
Module Type	S			☒ **Theory** ☒ **Lecture** **Lab** ☒ **Tutorial** **Practical** **Seminar**	
Module Code	CYBS-203				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level	2		**Semester of Delivery**	1	
Administering Department			**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	13. The theory of computability aims to teach the student to use algebraic laws. 14. Laws of algebra of propositions 15. In addition to the study of quantifiers 16. Study different groups, theories and schemes, in addition to studying the type of grammar. 17. the study of DFA and NDFA 18. State deletion algorithms and many topics so that the student can solve issues related to computational theory with ease and clarity.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	13. In theoretical College of Science, computational theory is the branch that deals with the effectiveness of solving problems through a computational model using an algorithm. 14. We divide this field into three main sections: autonomy theory and languages, computational theory, and computational complexity theory. 15. Because it is easy to form, it can be analyzed and used to prove results, 16. Because it represents what many consider to be the most powerful 'logical' computational model possible. 17. The possibility of an infinite amount of memory seems to be an unattainable advantage, but any problem decided to be solved by means of a Turing machine will always require only a finite amount of memory. So in principle, 18. Any problem that can (decided) be solved by a Turing machine can therefore be solved by a computer with a limited amount of memory. 19. Computational theory can be considered the creation of models of all kinds in the field of computer science. Therefore, mathematics and logic are used.
Indicative Contents المحتويات الارشادية	The aim of Theory of Computability is to teach the student to use algebraic laws in solving problems, in addition to studying quantifiers, studying groups, theories, and different schemes, in addition to studying the type of grammer, studying DFA and NDFA, state deletion algorithms, and many other topics so that the student can solve problems related to theory. Calculation with ease and clarity.

Learning and Teaching Strategies اسس برامجيات التعليم والتعلم

Strategies	Computability theory deals primarily with the question of the extent to which a problem is solvable on a computer. Computational theory relies mostly on the results of the stopping problem. Computational theory in computer science studies the possibility of efficiently solving problems by means of a computer and studies what a computer can calculate at present and the possibility of its development in the future.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**75**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	
	Assignments	2	10% (10)	2 and 12	
	Projects	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	Theory of computability
Week 2	grammar
Week 3	Type of grammar
Week 4	Quiz
Week 5	Derivation trees for context free grammar
Week 6	Simplification of context free grammar
Week 7	Finite automata and their language
Week 8	Type of finite automata
Week 9	Context free grammer
Week 10	The equivalence of DFA and NDFA
Week 11	Regular expression (RE)
Week 12	Equivalence of FA and (RE)
Week 13	Context sensitive grammar
Week 14	How to solve laws of relations
Week 15	Other approaches to computability
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	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 Mathematics and Its Applications_7th_Edition • Introduction to Languages and the Theory of Computation.	Yes
Recommended Texts	Theory and Applications of Computability, In cooperation with the association Computability in Europe.	No
Websites	https://bookauthority.org/books/best-computability-books	

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	**هياكل البيانات**			**Module Delivery**	
Module Type	**B**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CYBS-202**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	1	
Administering Department			**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. Development problem solving skills and understanding of data structure. 2. This course deals with the basic concept of data structure. 3. Storing and organizing data in a computer. 4. To perform different types of data structures. 5. Providing a way to efficiently manage large amounts of data, such as large databases and Internet indexing services. 6. Different types of data structures are suitable for different types of applications. For example, (B-Tree) The binary tree is well suited for implementing databases, while compiler implementations usually use hash tables to look up identifiers.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize Data representation, Abstract Data Types, Physical representation of data, Logical representation of data & array definition. 2. Recognize Python language, Variables & constant in python, Python primitive type, Assignment statement with primitive type. 3. Recognize One dimensional array representation in memory, Calculation the address of one dimensional array. 4. Recognize Two dimensional array definition, Calculation the address of two dimensional array. 5. Recognize Multidimensional array definition, Calculation the address of Multidimensional array. 6. Explain Stack, Stack algorithms, Stack application, Convert infix to postfix, Check Matching brackets, Calculation postfix expression. 7. Explain Queue, Queue representation, Queue algorithms, Queue application, and Circular queue. 8. Recognize & Explain Sorting Algorithms, Selection Sort, Insertion Sort, Bubble Sort, Merge Sort. 9. Recognize & Explain Searching Algorithms, Sequential Search, Binary Search.
Indicative Contents المحتويات الارشادية	Indicative content includes the following.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
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 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 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 - Data representation, Abstract Data Types, Physical representation of data, Logical representation of data & array definition
Week 2	Introduction to Python language, Variables & constant in python, Python primitive type, Assignment statement with primitive type

Week 3	One dimensional array representation in memory, Calculation the address of one dimensional array
Week 4	Two dimensional array definition, Calculation the address of two dimensional array
Week 5	Multidimensional array definition, Calculation the address of Multidimensional array
Week 6	Stack, Stack application
Week 7	Convert infix to postfix
Week 8	Check Matching brackets
Week 9	Calculation postfix expression
Week 10	Queue, Queue representation
Week 11	Queue algorithm, Queue application, Circular queue
Week 12	Sorting Algorithm, Selection Sort, Insertion Sort
Week 13	Bubble Sort, Merge Sort
Week 14	Searching Algorithm, Sequential Search
Week 15	Binary Search
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	Lab 1: Introduction to Python language, Variables & constant in python.
Week 2	Lab 2: Python primitive type, Assignment statement with primitive type.
Week 3	Lab 3: One dimensional array definition in Python, Program for One dimensional array definition in Python.
Week 4	Lab 4: Two dimensional array definition in Python. Program for Two dimensional array definition in Python.
Week 5	Lab 5: Stack representation in Python.
Week 6	Lab 6: Convert infix to postfix.
Week 7	Lab 7: Check Matching brackets.
Week 8	Lab 8: Calculation postfix expression.
Week 9	Lab 9: Queue representation in Python.
Week 10	Lab 10: Queue program in Python.
Week 11	Lab 11: Searching in Array in Python. Sorting in Array in Python.
Week 12	Lab 12: Selection Sort, Insertion Sort.

Week 13	Lab 13: Bubble Sort, Merge Sort.
Week 14	Lab 14: Sequential Search.
Week 15	Lab 15: Binary Search.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Data Structures and Algorithms in Python, Michael T. Goodrich, John Wiley & Sons, 2015.	Yes
Recommended Texts	Python Data Structures and Algorithms, Benjamin Baka Packt Publishing Ltd, 2017.	No
Websites	YouTube: Various YouTube channels offer video tutorials and lectures on the Data Structure	

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	**البرمجة الكيانية(1)**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CYBS-201**				
ECTS Credits	**8.00**				
SWL (hr/sem)	**200**				
Module Level	UGII		**Semester of Delivery**	3	
Administering Department	Cybersecurity		**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	15/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	Teaching students: 1. How to write readable, reusable, and modular code. 2. Fundamental object-oriented programming concept. 3. Apply OOP concepts to your Python code. 4. Promotes students to enhance their coding ability.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After this course you will be able to 1- Use the basic Python programming concepts (Variables, Loops, and Functions) to instruct a computer to perform some basic tasks. 2- Manipulate common data structures in Python, including lists, tuples, dictionaries and sets. 3- Build an algorithm to solve a problem and then convert it into a program. 4- How to architect larger programs using object-oriented principles. 5- Work with the core libraries used for data processing in Python. 6- Combine all of the above via PyCharm Platform.
Indicative Contents المحتويات الارشادية	This course includes Introduction to programming concepts (Procedural and Object Oriented Programming) with simple real-life projects thus, students will become familiar with project programming. Procedural Programming – The program consists of data and modules/procedures that operate on the data. The two are treated as separate entities. [8 hrs] Dictionaries- A collection of key-value pairs. It is used to store data values like a map, which, unlike other data types, can hold multiple values as elements [4 hrs] Object Oriented Programming - All computations are carried out using objects. An object is a component of a program that knows how to perform certain actions and how to interact with other elements of the program. [8 hrs] Encapsulations, Abstraction, Inheritance and Polymorphism – The benefits of using object oriented programming concepts in creating programs for real life problems. [8hrs]

	Python Standard library – Is a collection of modules that are distributed with Python, which provides standardized solutions for many problems that occur in everyday programming. [8 hrs] Coding real-life Projects in the lab. [16 hrs]

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	To deliver this module effectively, we will focus on engaging students through active participation in exercises and activities that foster critical thinking. This will be accomplished through a combination of lectures and interactive Lab's, as well as Enhancing students' practical skills and proficiency, by introducing them to emerging programming trends, such as, mobile, IOT, e-commerce applications, open source and GUI-based applications.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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**	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	Introducing Programming Concepts
Week 2	Arithmetic, logic, and comparison Operations
Week 3	Introducing Lists, and control statements
Week 4	Dictionaries, Accessing, Adding and Modifying Values
Week 5	Functions (Defining Functions, Passing Arguments, Return Values)
Week 6	Functions, Modules, Bug Busting and Exceptions
Week 7	Classes and Objects (Creating and Using a Class)
Week 8	Classes and Objects (Inheritance)
Week 9	Classes and Objects (Examples on Class Inheritance)
Week 10	Classes and Objects (Importing Classes and Modules)
Week 11	Python Standard Library –Part 1
Week 12	Python Standard Library –Part 2
Week 13	Files and Exceptions
Week 14	Testing code (Testing Functions)
Week 15	Testing code (Testing Classes)
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبرات

	Material Covered
Week 1	Lab 1: Prepare working environment
Week 2	Lab 2: Arithmetic, logic, and comparison Operations, Control Statements
Week 3	Lab 3: Arithmetic, logic, and comparison Operations, Control Statements
Week 4	Lab 4: Lists, 2D Lists, List Methods, Tuples and Dictionaries
Week 5	Lab 5: Exercises and small Project about functions
Week 6	Lab 6: Exercises and small Project about classes and objects
Week 7	Lab 7: Files and Exceptions

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	How to Think Like a Computer Scientist: Learning with Python	Yes
Recommended Texts	Python Crash Course, 2nd Edition. Copyright © 2019 by Eric Matthes.	No
Websites	Python Tutorial (w3schools.com)	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**الجيمقراطية وحقوق الانسان**			**Module Delivery**	
Module Type	**S**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOM1040**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	2		**Semester of Delivery**	2	
Administering Department			**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	The course aims to introduce human rights in order to defend human dignity and contribute to changing human life for the better regarding: change in values and feelings - and change in behavior, as well as promoting the idea of social justice and strengthening the link between the individual and the group and the state and its institutions, and developing monitoring skills Violations, dealing with violators, supporting the skills of understanding human rights issues, in addition to enhancing ways to participate in public affairs - citizenship.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	7. Human rights are a set of fundamental entitlements and freedoms that are inherent to all individuals, regardless of their nationality, race, gender, religion, or any other characteristic. 8. They are based on the principles of dignity, equality, and respect for the inherent worth and value of every human being.
Indicative Contents المحتويات الارشادية	Human rights are universal, meaning they apply to everyone, everywhere, without discrimination. They encompass civil, political, economic, social, and cultural rights, and are often codified in international and national legal frameworks. Civil and political rights include the right to life, liberty, and security of person; freedom of expression, assembly, and association; the right to a fair trial; and protection against torture, arbitrary arrest, and discrimination.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	Civil and political rights include the right to life, liberty, and security of person; freedom of expression, assembly, and association; the right to a fair trial; and protection against torture, arbitrary arrest, and discrimination.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem)	32	**Structured SWL (h/w)**	2

الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب اسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 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	جذور حقوق الانسان وتطورها في التاريخ الب رشي
Week 2	حقوق الانسان: التحديد والتعريف والضمانات
Week 3	محتوى: الحريات العامة
Week 4	النظرية العامة للحريات العامة
Week 5	النظام القانوني للحريات العامة
Week 6	ضمانات الحرية العامة
Week 7	ضمانات الحرية العامة
Week 8	مفهوم المساواة
Week 9	مبادئ الحريات العامة تفصيليا

Week 10	حرية الأمن والشعور والاطمئنان
Week 11	حريات الفكرية
Week 12	قانون الفصل بر ·ي الدولة والكنيسة
Week 13	حرية العمل
Week 14	حرية التجارة والصناعة
Week 15	حرية التجارة والصناعة المبحث الأول: الاحزاب السياسية والحريات العامة المبحث الثا · ين: الحريات العامة · يف العالم الثالث المبحث الثالث:التقدم العل يم والتق · ين والحريات العامة

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	د.امر ير عبد العزيز، حقوق الأنسان · يف الأسلام	NO
Recommended Texts	نشين محمد عبده حسونة،2015 ، حقوق الانسان... المفهوم والخصائص والتصنيفات والمصادر	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	Dynamic Websites Programming			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CyB 408**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	UGIV		**Semester of Delivery**	8	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Static Websites Programming	**Semester**	7

Co-requisites module	None	**Semester**	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Hands-On Coding: Practical exercises. 2. Group Projects: Collaborative tasks. 3. Tutorials: Personalized guidance. 4. Peer Learning: Knowledge sharing. 5. Online Resources: Access to tools. 6. Assessment and Feedback: Regular evaluation. 7. Guest Speakers: Industry insights. 8. Real-World Challenges: Practical tasks. 9. Final Project: Creating a static website.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	56	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبو يع النظري

	Material Covered
Week 1	• Introduction to PHP • Overview of server-side programming • Role of PHP in web development • Setting up a PHP development environment (XAMPP, WAMP, MAMP, or LAMP)
Week 2	• PHP Basics • PHP syntax and structure • Variables and data types in PHP • Constants and their usage
Week 3	• Control Structures in PHP • Conditional statements: if, if-else, switch • Loops: for, while, do-while, and foreach
Week 4	• PHP Functions • Defining and calling functions • Parameters and return values • Understanding variable scope and global variables
Week 5	• Arrays in PHP • Indexed, associative, and multidimensional arrays • Array functions (e.g., sort, merge, slice) • Iterating through arrays

Week 6	• Arrays in PHP • Indexed, associative, and multidimensional arrays • Array functions (e.g., sort, merge, slice) • Iterating through arrays
Week 7	• String Handling in PHP • Common string functions (e.g., strlen, str_replace, substr) • Using regular expressions for pattern matching • Encoding and decoding strings
Week 8	• File Handling in PHP • Reading from and writing to files • Uploading files securely • Working with file metadata (size, type)
Week 9	• PHP and Databases • Introduction to MySQL and PHP integration • Connecting to a database using MySQLi and PDO • Performing basic SQL operations: SELECT, INSERT, UPDATE, DELETE
Week 10	• Advanced Database Operations in PHP • Using prepared statements to prevent SQL injection • Handling database errors • Pagination and data display from databases
Week 11	• Sessions and Cookies in PHP • Creating and managing sessions • Using cookies to store user preferences • Session security best practices
Week 12	• Web Security in PHP • Common vulnerabilities: SQL injection, XSS, CSRF • Preventing attacks with secure coding practices • Input validation and output escaping
Week 13	• Error Handling and Debugging in PHP • PHP error types and reporting levels • Using try-catch blocks for exception handling • Debugging techniques and tools (e.g., var_dump, Xdebug)

Week 14	• PHP Project Development • Understanding project structure and organization • Implementing MVC architecture • Deploying PHP projects to a server
Week 15	• Final Review and Examination • Reviewing key concepts • Comprehensive Q&A and project presentation

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	• Lab 1: Setting Up a PHP Environment • Installing XAMPP or WAMP • Writing and running the first PHP script (Hello World) • Using PHP in HTML pages
Week 2	• Lab 2: PHP Basics

	• Declaring variables and using constants • Performing arithmetic and string operations • Writing basic PHP scripts with dynamic out
Week 3	• Lab 3: Control Structures in Action • Writing programs with if-else and switch-case • Implementing loops (e.g., generating tables or lists) • Practical examples of nested loops

Week 4	• Lab 4: Handling Forms with PHP • Creating and processing forms with GET and POST • Validating user input (required fields, email validation) • Redirecting after form submission
Week 5	• Lab 5: Building and Using PHP Functions • Creating reusable functions for calculations • Using parameters and return values • Demonstrating variable scope within functions
Week 6	• Lab 6: Working with Arrays • Creating and populating arrays • Iterating through arrays with foreach • Manipulating arrays (e.g., sorting, filtering, searching)
Week 7	• Lab 7: String Operations • Using string functions (e.g., substr, strpos, str_replace) • Creating scripts with regular expressions • Encoding/decoding strings for secure processing
Week 8	• Lab 8: File Handling • Writing to and reading from files • Handling file uploads and displaying uploaded files • Securing file upload processes

Week 9	• Lab 9: Database Integration • Connecting to a MySQL database • Performing CRUD operations using PHP and SQL • Displaying database data in HTML tables
Week 10	• Lab 10: Advanced Database Operations • Using prepared statements for secure queries • Building a search feature with filtered results • Creating paginated views of database content
Week 11	• Lab 11: Managing Sessions and Cookies • Implementing login/logout functionality with sessions • Using cookies to store user preferences • Securing session data from attacks
Week 12	• Lab 12: Securing PHP Applications • Preventing SQL injection and XSS vulnerabilities • Validating and escaping user input • Testing web application security
Week 13	• Lab 13: Error Handling and Debugging • Debugging scripts using var_dump and print_r • Handling exceptions with try-catch blocks • Writing a custom error handler
Week 14	• Lab 14: Final Project Development • Building a PHP-based web application (e.g., blog, e-commerce site) • Integrating all learned skills (forms, databases, sessions, and security) • Testing and deploying the project
Week 15	• Lab 15: Final Lab Review and Assessment • Reviewing key lab exercises • Final project presentation and evaluation

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	**أمن البرمجيات**			**Module Delivery**	
Module Type	**B**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CYBS-210**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	2	
Administering Department			**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	9. Understanding Security Concepts: The course aims to provide students with a solid understanding of the fundamental concepts and principles of software security. This includes knowledge of common security threats, vulnerabilities, and attacks that software systems can face. 10. Developing Secure Coding Skills: The course aims to equip students with the necessary skills to develop secure software. Students will learn about secure coding practices, including techniques to prevent and mitigate common coding vulnerabilities such as injection attacks, buffer overflows, and cross-site scripting. 11. Implementing Secure Software Development Practices: The course aims to familiarize students with secure software development methodologies and processes. Students will learn about the secure software development life cycle (SSDLC) and how to integrate security considerations into each phase of the software development process. 12. Designing Secure Software Architecture: The course aims to teach students about secure software architecture design principles and patterns. Students will learn how to identify and address security risks at the architectural level, including considerations for secure deployment and configuration management. 13. Enhancing Security Testing and Risk Assessment Skills: The course aims to enhance students' skills in security testing and risk assessment. Students will learn various techniques and tools for security testing, including penetration testing and vulnerability scanning. They will also gain knowledge about threat modeling and risk assessment methodologies to identify and prioritize security risks in software systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Overview of software security principles and goals 2. Common security threats and attacks 3. Introduction to secure software development life cycle (SSDLC) 4. Identifying security requirements for software systems 5. Risk assessment methodologies and threat modeling 14. Security metrics and measuring security effectiveness
Indicative Contents المحتويات الارشادية	

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	Software security refers to the practice of implementing measures and techniques to protect software applications and systems from unauthorized access, data breaches, and malicious attacks. It involves ensuring the confidentiality, integrity, and availability of software and its associated data.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 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 to Software Security
Week 2	Software Security Requirements and Risk Assessment
Week 3	Secure Coding Practices • Understanding common coding vulnerabilities (e.g., buffer overflow, SQL injection) • Best practices for secure coding in popular programming languages • Code reviews and static analysis tools for vulnerability detection
Week 4	Web Application Security • Common web application vulnerabilities (e.g., cross-site scripting, cross-site request forgery) • Secure coding practices for web applications • Web application security testing techniques
Week 5	Secure Software Development Life Cycle (SSDLC) • Overview of the SSDLC phases (requirements, design, coding, testing, deployment) • Integrating security into each phase of the SSDLC • Security testing and code analysis throughout the development process
Week 6	Secure Software Architecture Secure software design principles and patterns • Secure software deployment and configuration management • Threat modeling and risk assessment for software architecture
Week 7	Secure Database Management • Securing databases against common vulnerabilities (e.g., injection attacks) • Encryption and key management for data at rest and in transit • Database security best practices and secure database administration
Week 8	Secure Mobile Application Development • Unique security challenges in mobile app development • Secure coding practices for mobile platforms (iOS, Android) • Mobile app security testing and vulnerability assessment
Week 9	Software Security Testing

	• Types of security testing (e.g., penetration testing, vulnerability scanning) • Security testing tools and techniques • Test planning and reporting for software security testing
Week 10	: Secure Software Maintenance and Patch Management • Importance of ongoing software maintenance for security • Patch management strategies and practices • Security incident response and handling
Week 11	Secure Coding Frameworks and Libraries • Introduction to secure coding frameworks (e.g., OWASP Top 10) • Secure coding libraries and their usage • Secure software development resources and references
Week 12	Secure Software Deployment • Secure software deployment methodologies (e.g., containerization, DevSecOps) • Cloud computing security considerations • Identity and access management in cloud environments
Week 13	Secure Coding for IoT and Embedded Systems • Security challenges in IoT and embedded systems • Secure coding practices for IoT and embedded software • Secure communication protocols for IoT devices
Week 14	Social Engineering and Human Factors in Software Security • Understanding social engineering techniques and prevention measures • Human factors in software security (e.g., user awareness, training) • Psychological aspects of security behavior
Week 15	**: Emerging Trends in Software Security** • **Exploration of emerging threats and attack vectors** • **Overview of cutting-edge security technologies (e.g., blockchain, AI)** • **Discussion on future directions and challenges in software security**

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

Week 1	
Week 2	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Designing Secure Software: A Guide for Developers, Loren Kohnfelder ,2021	NO
Recommended Texts	Web Application Security: Exploitation and Countermeasures for Modern Web Applications, Andrew Hoffman, O'Reilly Media; 1st edition 2020 Software Security: Building Security In, by Gary McGraw (Author), Addison-Wesley, 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 معلومات المادة الدراسية					
Module Title	أدوات الأمن السيبراني			**Module Delivery**	
Module Type	C			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CYBS-208				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	2		**Semester of Delivery**	2	
Administering Department			**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. Understand the fundamentals of cybersecurity and the importance of security tools. 2. Gain practical knowledge of commonly used cybersecurity tools and their functionalities. 3. Learn how to assess and mitigate risks using cybersecurity tools. 4. Develop hands-on skills in deploying, configuring, and managing security tools. 5. Understand the role of cybersecurity tools in incident detection, response, and recovery.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	10. This course provides an overview of essential cybersecurity tools used to protect computer systems, networks, and data from cyber threats. Students will gain hands-on experience with various tools and learn how to analyze, detect, and respond to security incidents. The course will cover topics such as firewalls, intrusion detection systems, antivirus software, vulnerability scanners, encryption tools. 11. Threat Detection: Cybersecurity tools employ various techniques like intrusion detection systems (IDS), intrusion prevention systems (IPS), and security information and event management (SIEM) to detect potential threats and malicious activities. These tools monitor network traffic, log files, and system behavior to identify indicators of compromise (IoCs) and abnormal activities. 12. Vulnerability Management: Cybersecurity tools help identify vulnerabilities in software, applications, and network infrastructure. Vulnerability scanners and assessment tools scan systems and provide reports on weaknesses and potential risks. This information is crucial for implementing patches, updates, and security measures to mitigate vulnerabilities. 13. Incident Response: When a security incident occurs, cybersecurity tools aid in incident response efforts. They provide real-time alerts, log analysis, and forensic capabilities to investigate incidents, determine the scope and impact of the breach, and assist in containing and remedying the situation. Incident response tools help.
Indicative Contents المحتويات الارشادية	Firewalls: Firewalls are the first line of defense in network security. They monitor and control incoming and outgoing network traffic based on predefined security rules, blocking potentially malicious connections. Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS): IDS tools monitor network traffic and systems for suspicious activities or known attack patterns, alerting administrators to potential security breaches. IPS tools go a step further by actively blocking or preventing malicious activities.

	Antivirus Software: Antivirus software scans files, programs, and systems for known malware signatures, providing protection against viruses, worms, Trojans, and other types of malicious software. Vulnerability Scanners: Vulnerability scanners identify and assess security weaknesses or vulnerabilities within systems or networks. They help in identifying misconfigurations, outdated software, and other weaknesses that attackers could exploit. Security Information and Event Management (SIEM) Tools: SIEM tools collect and analyze security event data from various sources within a network, allowing for centralized monitoring and detection of security incidents. Data Loss Prevention (DLP) Tools: DLP tools prevent the unauthorized transfer or leakage of sensitive data by monitoring and controlling data access, usage, and transmission.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	It's important to note that cybersecurity tools are just one part of a comprehensive cybersecurity strategy. Proper implementation, regular updates, and ongoing monitoring are crucial for maintaining effective security in the face of evolving threats.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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.	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 Cybersecurity
Week 2	Overview of cybersecurity principles and concepts
Week 3	Understanding the threat landscape and attack vectors
Week 4	Legal and ethical considerations in cybersecurity
Week 5	Network Security Tools
Week 6	Firewalls: Types, configuration, and rule management
Week 7	Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS)
Week 8	Virtual Private Networks (VPNs) for secure remote access
Week 9	Malware Protection Tools
Week 10	Antivirus software: Scanning, signature-based detection, and heuristics
Week 11	Anti-malware tools and techniques
Week 12	Vulnerability Assessment and Management
Week 13	Encryption and Cryptography Tools
Week 14	Encryption algorithms and protocols
Week 15	Public key infrastructure (PKI) and digital certificates
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Nessus: A vulnerability scanning 2. Burp Suite: A web application security testing tool	No
Recommended Texts	3. Wireshark: A network protocol 4. Metasploit: A penetration testing framework	No
Websites	- YouTube: Various YouTube channels offer video tutorials and lectures on the cyber security tools.	

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	**البرمجة الكيانية(2)**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CYBS-207**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	2		**Semester of Delivery**	2	
Administering Department			**College**	College of Science	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	Teaching students: 5. How to write readable, reusable, and modular Project. 6. How to refactor their code periodically. 7. Manipulate programming errors. 8. How to test and maintain their code.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After this course you will be able to 1. Introducing students to the Object-Oriented Programming manner, which give them deep-insight into the related main topics. 2. Design the class diagram and Determine the main phases of the projects that will be created 3. Gaining the student, the ability and confidence to improve existing projects toward implementing their own versions of the particular project. 4. Design and implement small projects that pave the way for them to enter the world of markets and meet their needs.
Indicative Contents المحتويات الارشادية	This course includes Project's planning and requirements definition, class diagram designing, main phases definition, project development, and finally test and maintain their project. Project's planning - s a procedural step in project management, where required documentation is created to ensure successful project completion. Documentation includes all actions required to define, prepare, integrate and coordinate additional plans. . [8 hrs] Class diagram - Type of diagram and part of a unified modeling language (UML) that defines and provides the overview and structure of a system in terms of classes, attributes and methods, and the relationships between different classes. It is primarily designed for developers to provide the conceptual model and architecture of the system being developed. [8hrs]

	Main phases definition – a way of breaking down projects into more manageable and accurate parts. The number and names of the phases may vary, but some common ones are initiation, planning, execution, monitoring and control, and closure. Each phase has a different focus and requires different skill sets, tasks, processes, stakeholders, and organizations. [8 hrs] Testing and Maintaining - the process of verifying the accuracy and completeness of project deliverables before they are released to the customer. It is an essential part of quality assurance and helps to ensure that the final product meets the customer's expectations [16 hrs] Coding real-life Projects in the lab. [20 hrs]

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	Our primary goal in delivering this module is to engage students through active participation and the development of critical thinking skills. To achieve this, we will survey new in-class learning aid frameworks, comprising of work procedure and communication and display devices, such frameworks enhance students understanding and maintain contact with the instructor as well as make students used to new technology.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	108	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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**	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	OOP Concepts (Quick Glance)
Week 2	Planning and Requirements Definition
Week 3	Class Diagram Designing
Week 4	Main Phases Definition
Week 5	Defining Related Libraries
Week 6	Main Screen Designing
Week 7	Classes Development (Create the main class)

Week 8	Classes Development (Create the other classes)
Week 9	Modules and Classes Importing (Connect the classes by importing)
Week 10	Code Refactoring I
Week 11	Classes Inheritance Managing
Week 12	Display Elements Managing
Week 13	Code Refactoring II
Week 14	Testing and Maintenance
Week 15	Experimental Results
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبرات

	Material Covered
Week 1	Lab 1: Planning and Requirements Definition
Week 2	Lab 2: Prepare the working environment
Week 3	Lab 3: Start Code the main class
Week 4	Lab 4: Install the additional required libraries
Week 5	Lab 5: improve the main class and Fix the attributes and methods related to the screen design
Week 6	Lab 6: Connect the classes by importing
Week 7	Lab 7: Graphical User Interface developing
Week 8	Lab 8:Testing and Maintain the Project

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Python Crash Course, 2nd Edition. Copyright © 2019 by Eric Matthes.	Yes
Recommended Texts	How to Think Like a Computer Scientist: Learning with Python.	No

	Python for Cybersecurity: Using Python for Cyber Offense and Defense.	
Websites	Python Tutorial (w3schools.com)	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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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	**معمارية الحاسوب**			**Module Delivery**	
Module Type	**S**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CMCs25_F31071**				
Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	3		**Semester of Delivery**	1	
Administering Department			**College**		
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. A comprehensive understanding of computer architecture principles, components, and organization. 2. Proficiency in designing and evaluating computer architectures. 3. Knowledge of performance metrics and evaluation methods. 4. Familiarity with memory systems, input/output devices, and their optimization
Module Learning Outcomes مخرجات التعليم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Students will gain a comprehensive understanding of the components that make up a computer system, including the CPU, memory, and input/output devices. 2. Be able to comprehend the organization and functioning of the CPU, including the datapath, control unit, and instruction execution. They will also understand the design principles and characteristics of Instruction Set Architecture (ISA). 3. Acquire the skills to design and optimize memory hierarchies, including caches and virtual memory systems. They will understand the trade-offs involved in memory design and management. 4. will learn the principles and techniques of pipelining and understand the benefits and challenges associated with parallel processing 5. : Students will develop the skills to analyze and evaluate performance metrics of computer systems, including speed, throughput, and latency. 6. Student will gain knowledge of emerging trends and technologies in computer architecture, such as multi-core and many-core architectures, heterogeneous computing, and power-efficient design
Indicative Contents المحتويات الارشادية	Indicative content includes the following. • Instruction Set Architecture (ISA): The interface between the hardware and software of a computer system, defining the instructions that can be executed by the processor. • Cache Memory: A small, fast memory located closer to the processor, used to store frequently accessed data and instructions for faster access compared to main memory. • Virtual Memory: A memory management technique that allows a computer to use secondary storage (e.g., hard disk) as an extension of main memory, providing a larger addressable space for programs. • Input/Output (I/O): The process of transferring data between a computer and external devices (e.g., keyboard, mouse, disk drives) for communication and data storage.

	• DMA (Direct Memory Access): A feature that allows certain devices to transfer data directly to and from memory without involving the processor, reducing CPU overhead. • Address Translation: The process of converting virtual addresses to physical addresses, performed by the memory management unit (MMU) in a computer system. • Page Replacement Algorithms: Policies used by the operating system to decide which pages in virtual memory should be replaced when the available physical memory is full. • Cache Coherence Protocols: Algorithms and protocols used to maintain cache coherence in multi-processor systems, ensuring that all caches observe the same value for shared data.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	In a Computer Architecture course, effective learning and teaching strategies can be employed to foster a comprehensive understanding of the principles and design of computer systems. Strategies may include lectures to introduce foundational concepts, hands-on lab sessions for practical experimentation and implementation, case studies to analyze real-world architectures, group projects to promote collaboration and problem-solving skills, interactive discussions to explore advanced topics, and assessments to gauge student comprehension. These strategies aim to provide students with a solid foundation in computer architecture, enabling them to design and analyze efficient and high-performance computer systems.

Student Workload (SWL) الحمل الدرا يس للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 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 to Computer Architecture
Week 2	Digital Logic and Boolean Algebra
Week 3	CPU Organization and Instruction Set Architecture
Week 4	CPU Datapath and Control Unit
Week 5	Memory Systems
Week 6	Input/Output Devices and Systems
Week 7	Pipelining
Week 8	Advanced Pipelining and Superscalar Processors
Week 9	Memory Hierarchy and Cache Coherence
Week 10	Parallel Processing and Vector Processing
Week 11	Power and Energy Efficiency in Computer Systems
Week 12	Emerging Trends in Computer Architecture
Week 13	Performance Evaluation and Benchmarking
Week 14	Quantitative Analysis and Simulation

Week 15	Future Directions in Computer Architecture
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	Lab 1 Introduction to Assembly Language Programming
Week 2	Lab 2: Processor Simulation and Instruction Execution
Week 3	Lab 3 Memory Hierarchy and Cache Simulation
Week 4	Lab 4 Virtual Memory Simulation
Week 5	Lab 5: I/O Device Simulation and Interfacing
Week 6	Lab 6: Parallel Processing and Synchronization
Week 7	Lab 7: Advanced Topics in Computer Architecture

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	- Essentials of Computer Architecture, Second Edition, by Douglas Comer, 2017	No
Recommended Texts	Computer Architecture: A Quantitative Approach (The Morgan Kaufmann Series in Computer Architecture and Design) 6th Edition, by by John L. Hennessy (Author), David A. Patterson (Author),2017	No
Websites	https://www.online.colostate.edu/courses/CS/CS470.dot	

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	ذكاء أصطناعي			**Module Delivery**	
Module Type	S			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CMCs25_F31061				
Credits	4				
SWL (hr/sem)	100				
Module Level	3		**Semester of Delivery**	1	
Administering Department			**College**		
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. Familiarize students with the foundational concepts and techniques of artificial intelligence. 2. Enable students to apply machine learning algorithms for classification, regression, and clustering tasks. 3. Equip students with the skills to design, train, and evaluate neural networks and deep learning models. 4. Introduce students to natural language processing techniques for text analysis and language modeling. 5. Provide students with an understanding of reinforcement learning principles and their applications. 6. Develop students' ability to analyze and evaluate AI models, making informed decisions for optimal performance.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After studying this course Students will gain: 1. Solid understanding of the core concepts, techniques, and applications of artificial intelligence. 2. Learn how to apply and implement supervised and unsupervised learning algorithms to real-world datasets. 3. Knowledge and skills necessary to design, train, and evaluate neural networks and deep learning . 4. Explore natural language processing techniques 5. Students will grasp the fundamentals of reinforcement learning. 6. Ability to critically analyze and evaluate AI models, assess their performance, and make informed decisions about model selection.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. • Machine Learning: A subfield of AI focused on developing algorithms and models that enable computers to learn from data and make predictions or decisions without being explicitly programmed. • Neural Networks: A type of machine learning model inspired by the structure and function of the human brain, consisting of interconnected nodes (neurons) organized in layers to process and learn from data.

	• Natural Language Processing (NLP): A branch of AI that deals with the interaction between computers and human language, enabling machines to understand, interpret, and generate human language. • Reinforcement Learning: A type of machine learning where an agent learns to make decisions or take actions in an environment to maximize a reward signal, based on trial and error learning and feedback from the environment. • Deep Learning: A subset of machine learning that focuses on training deep neural networks with multiple layers, allowing the models to automatically learn hierarchical representations of data and perform complex tasks. • Supervised Learning: A type of machine learning where the model learns from labeled training data, where the input data is associated with known output labels, and the model aims to generalize and make predictions on unseen data. • Unsupervised Learning: A type of machine learning where the model learns from unlabeled data, finding patterns, structures, or relationships in the data without explicit labels or guidance. • Natural Language Understanding (NLU): A subset of NLP that focuses on enabling machines to comprehend and interpret natural language, including tasks such as sentiment analysis, named entity recognition, and question answering.

Learning and Teaching Strategies

ستراتيجيات التعليم والتعلم

Strategies	Learning and teaching strategies for an Artificial Intelligence course can include hands-on projects, collaborative learning, case studies, coding exercises, literature reviews, and lectures. Hands-on projects engage students in implementing AI algorithms and solving real-world problems. Collaborative learning encourages group discussions and peer-to-peer knowledge sharing. Case studies showcase practical applications of AI. Coding exercises develop programming skills. Literature reviews deepen understanding of cutting-edge AI research. Lectures and presentations deliver theoretical concepts and provide a foundation for understanding AI principles and techniques.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem)	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4

الحمل الدراسي المنتظم للطالب خلال الفصل			
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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)	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 to Artificial Intelligence
Week 2	Search Algorithms, Uninformed ,Heuristic search algorithms and Adversarial
Week 3	Knowledge Representation and Logic
Week 4	Machine Learning Fundamentals
Week 5	Neural Networks and Deep Learning
Week 6	Natural Language Processing (NLP)
Week 7	Reinforcement Learning
Week 8	Evolutionary Computing

Week 9	Bayesian Networks and Probabilistic Reasoning
Week 10	Fuzzy Logic and Fuzzy Systems
Week 11	Swarm Intelligence and Optimization
Week 12	Knowledge-Based Systems
Week 13	Computer Vision
Week 14	Robotics and AI
Week 15	Ethical and Social Implications of AI
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبرات

	Material Covered
Week 1	Lab 1: Introduction to Python and AI Libraries
Week 2	Lab 2: Supervised Learning with Classification Algorithms
Week 3	Lab 3: Unsupervised Learning with Clustering Algorithms
Week 4	Lab 4: Natural Language Processing (NLP) Techniques
Week 5	Lab 5: Neural Networks and Deep Learning
Week 6	Lab 6: Reinforcement Learning
Week 7	Lab 7: AI Project Showcase and Finalization

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Artificial Intelligence: Foundations of Computational Agents" by David L. Poole and Alan K. Mackworth (2017)	No
Recommended Texts	"Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig (4th edition, 2020)	No
Websites	https://www.coursera.org/learn/introduction-to-ai	

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	شفرات الخيبثة			**Module Delivery**	
Module Type	C			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CMCs25_F31041				
Credits	6				
SWL (hr/sem)	150				
Module Level	3		**Semester of Delivery**	1	
Administering Department			**College**		
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**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			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. Develop an understanding of the principles and techniques used in the analysis of malicious code. 2. Acquire knowledge and skills to perform static and dynamic analysis of malware samples. 3. Learn to identify and interpret indicators of compromise (IOCs) and behavioral patterns in malicious code. 4. Gain proficiency in using tools and technologies for malware detection, classification, and attribution. 5. Develop the ability to reverse engineer malware binaries to uncover their inner workings and functionality. 6. Cultivate critical thinking and problem-solving skills to assess and mitigate the impact of malicious code on systems and networks.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Apply advanced techniques and methodologies to analyze and dissect various types of malicious code. 2. Demonstrate proficiency in using tools and technologies for static and dynamic analysis of malware samples. 3. Identify and interpret indicators of compromise (IOCs) and behavioral patterns in malicious code to detect and mitigate threats. 4. Develop skills in reverse engineering malware binaries to understand their functionality and potential impact. 5. Assess and evaluate the effectiveness of malware detection and classification methods, using appropriate metrics. 6. Apply ethical considerations and best practices in conducting malware analysis to ensure confidentiality, integrity, and availability of systems and data.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. • Malware: Malicious software designed to disrupt, damage, or gain unauthorized access to computer systems or networks. • Static Analysis: Examination of software or code without executing it, typically involving the analysis of file structures, strings, and metadata. • Dynamic Analysis: Analysis of software or code during runtime execution, often involving behavior monitoring and code instrumentation.

	• Indicators of Compromise (IOCs): Artifacts or patterns that indicate the presence of malicious activity or compromise within a system or network. • Reverse Engineering: Process of deconstructing and analyzing software or code to understand its inner workings, including the identification of functionality and vulnerabilities. • Signature-based Detection: Method of identifying malware by comparing known patterns or signatures against files or code snippets. • Behavioral Analysis: Analysis of the behavior and actions of software or code to detect malicious or suspicious activity. • Threat Intelligence: Gathering, analyzing, and sharing information about current and emerging threats, including malware campaigns and attack vectors.

Learning and Teaching Strategies
ستراتيجيات التعليم والتعلم

Strategies	This course can employ various effective learning and teaching strategies. Hands-on labs, case studies, and group projects provide students with practical experience in analyzing real-world malware samples and implementing detection algorithms. Guest speakers and industry experts can offer valuable insights and current trends in the field. Interactive discussions and debates foster critical thinking, while lectures, demonstrations, and lab sessions reinforce theoretical concepts and practical skills. Regular feedback and assessments allow for monitoring student progress, and the integration of real-world examples highlights the relevance and impact of malicious code analysis. These strategies promote active engagement, collaboration, and critical analysis, ensuring a comprehensive understanding of the subject matter.

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	4
Total SWL (h/sem)	**150**		

الحمل الدرا يس الك يل للطالب خلال الفصل	

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 to Malicious Codes Analysis
Week 2	Malware Detection Techniques
Week 3	Malware Behavior Analysis
Week 4	Reverse Engineering and Code Analysis
Week 5	Malware Traffic Analysis
Week 6	Rootkit Analysis
Week 7	digital forensics and its role in malware analysis
Week 8	Advanced Malware Analysis Techniques
Week 9	Malware Analysis Tools and Platforms
Week 10	Malware Signature Development
Week 11	Malware Incident Response
Week 12	Malware Analysis Case Studies

Week 13	Mobile Malware Analysis
Week 14	Malware Mitigation and Defense
Week 15	Emerging Trends in Malicious Codes
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus)
المنهاج الاسبوعي للمختبرات

	Material Covered
Week 1	Lab 1: Introduction to Malicious Code Analysis with Python
Week 2	Lab 2: Static Analysis Techniques with Python
Week 3	Lab 3: Dynamic Analysis Techniques with Python
Week 4	Lab 4: Malware Detection and Classification with Python
Week 5	Lab 5: Malware Reverse Engineering with Python
Week 6	Lab 6: Network-Based Malware Analysis with Python
Week 7	Lab 7: Advanced Topics in Malicious Code Analysis with Python

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	Malware Analyst's Cookbook: Tools and Techniques for Fighting Malicious Code, by Michael Ligh, Steven Adair, Blake Hartstein, and Matthew Richard, 2018.	No
Recommended Texts	"Malware Data Science: Attack Detection and Attribution" by Joshua Saxe and Hillary Sanders (2018).	No
Websites	https://www.coursera.org/learn/malware-analysis-and-assembly	

Grading Scheme
مخطط الدرجات

Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 -	**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

100)				

	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	**شبكات الحاسوب**			**Module Delivery**	
Module Type	**B**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CMCs25_F31031**				
Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	3		**Semester of Delivery**	1	
Administering Department			**College**		
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Computer Network: A collection of interconnected devices, such as computers, servers, routers, switches, and other network components, that communicate and share resources. Protocol: A set of rules and procedures that govern the communication and interaction between devices in a computer network, ensuring proper data transmission and handling. TCP/IP: Transmission Control Protocol/Internet Protocol, the foundational suite of protocols used for communication on the Internet. TCP provides reliable, connection-oriented data delivery, while IP is responsible for addressing and routing packets across networks.

	Ethernet: A widely used local area network (LAN) technology that uses a set of standards to define how data is transmitted over a network using twisted pair or fiber optic cables. Router: A network device that connects multiple networks and directs data packets between them based on network addresses, facilitating proper data routing and forwarding. Switch: A network device that connects devices within a local network (LAN) by forwarding data packets to the appropriate destination based on MAC addresses, increasing network efficiency and performance. DNS: Domain Name System, a distributed naming system that translates domain names (e.g., www.example.com) into IP addresses, allowing users to access websites using easy-to-remember names instead of numerical IP addresses. Firewall: A security device or software that monitors and controls incoming and outgoing network traffic based on predetermined security rules, protecting a network from unauthorized access and potential threats.

Learning and Teaching Strategies

ستراتيجيات التعليم والتعلم

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

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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.	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 networks and Underlying Technologies
Week 2	The OSI Model and the TCP/IP Protocol Suite
Week 3	Datalink Layer
Week 4	Network Layer
Week 5	Transport Layer
Week 6	Application Layer
Week 7	Classfull IP Addressing
Week 8	Subnetting
Week 9	Supernetting
Week 10	Classless Addressing1
Week 11	Classless Addressing2
Week 12	Delivery and Forwarding of IP Packets 1
Week 13	Delivery and Forwardingof IP Packets 2
Week 14	Internet Protocol Version 4(IPv4) 1

Week 15	Internet Protocol Version 4(IPv4) 2
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	Lab 1: Introduction and cabling
Week 2	Lab 2: : Server Administrator – users and groups
Week 3	Lab 3: Server Administrator – Security Options
Week 4	Lab 4: Server Administrator – Files, Printer and Hard disk Management
Week 5	Lab 5: How to build a complete networks in Packet Tracer
Week 6	Lab 6: How to build a complete networks in Packet Tracer
Week 7	Lab 7: DHCP Server/ DNS Server - Packet Tracer
Week 8	Lab 7: HTTP protocol / E-Mail Server - Packet Tracer

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- TCP/IPProtocol Suite - Fourth Edition – 2010, Behrouz A. Forouzan 2- Data Communications And Networking - Fourth Edition – 2007, Behrouz A. Forouzan	No
Recommended Texts	Advanced Network Programming - Principles and Techniques (Network Application Programming With Java) – 2013, BogdanCiubotaru.	No
Websites	Introduction to Computer Networks for Non-Techies | Udemy	

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	مبادئ الحوسبة السحابية			**Module Delivery**	
Module Type	C			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CMCs25_F31021				
Credits	5				
SWL (hr/sem)	125				
Module Level	3		**Semester of Delivery**	1	
Administering Department			**College**		
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	1. Understand the fundamental concepts, models, and characteristics of cloud computing, including on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service. 2. Explore the different cloud service models - Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) - and understand their distinctions, benefits, and use cases. 3. Learn about public, private, hybrid, and multi-cloud deployments, and understand the advantages, challenges, and considerations associated with each model. 4. Gain knowledge of cloud architecture components, such as virtual machines, virtual networks, and storage, and understand the role of virtualization technologies in enabling resource sharing and scalability. 5. Explore cloud security challenges and best practices, including data protection, access control, identity management, and compliance with regulations and industry standards. Understand the shared responsibility model and the importance of encryption and secure protocols. 6. Learn strategies for managing and optimizing cloud costs, including monitoring resource usage, rightsizing instances, leveraging pricing models, and implementing cost control measures.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completing the "Cloud Computing Principles" course, students will gain the following outcomes: 1. Acquire a thorough understanding of cloud computing concepts, architectures, and deployment models. 2. Develop practical skills in designing, implementing, and managing cloud-based solutions, including virtualization, storage, networking, and security. 3. Techniques for optimizing cloud performance, including monitoring, caching, and leveraging Content Delivery Networks (CDNs). 4. Effectively manage cloud costs through resource allocation, usage monitoring, and cost optimization strategies. 5. Understand the importance of cloud service-level agreements (SLAs), governance frameworks, and compliance considerations in cloud computing. 6. Familiar with emerging trends in cloud computing, such as serverless computing, DevOps practices, containerization, big data processing, and ethical and legal implications.

Indicative Contents المحتويات الارشادية	Indicative content includes the following. Cloud Computing: The delivery of computing resources, including servers, storage, databases, software, and networking, over the internet. Users can access and use these resources on-demand, without the need for physical infrastructure. Virtualization: The process of creating virtual instances of resources such as servers, storage, or networks. It enables the efficient utilization of physical hardware and allows for scalability and flexibility in cloud environments. Scalability: The ability of a system or application to handle increasing workloads by adapting its resources, such as adding or removing servers, to meet demand. It ensures that resources can be dynamically allocated based on the changing needs of the users. Elasticity: The ability of a system or application to automatically provision and release resources in response to changing demand. It allows for scaling up or down resources seamlessly to maintain performance and optimize cost efficiency. Service Level Agreement (SLA): A contract between a cloud service provider and a customer that defines the agreed-upon quality and availability of services. It outlines performance guarantees, response times, uptime requirements, and penalties for non-compliance. Data Security: Measures and practices implemented to protect data in cloud environments, including encryption, access control, backup and recovery, and compliance with data privacy regulations. It ensures the confidentiality, integrity, and availability of data stored and processed in the cloud. Hybrid Cloud: A cloud computing environment that combines the use of private and public clouds, allowing organizations to leverage the benefits of both. It enables the flexibility to run certain workloads on-premises while utilizing the scalability and cost-effectiveness of public cloud resources.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	Learning and teaching strategies for a Cloud Computing course can include a combination of theoretical and practical approaches. Strategies may involve lectures

	to introduce fundamental concepts, case studies to showcase real-world cloud deployments, hands-on lab exercises to provide practical experience with cloud platforms and services, group projects to promote collaboration and problem-solving skills, guest lectures by industry experts to provide insights into cloud adoption and best practices, and discussions on emerging trends and challenges in cloud computing. These strategies aim to provide students with a comprehensive understanding of cloud computing principles, architectures, and practical implementations.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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.	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 Cloud Computing
Week 2	Cloud Architecture and Virtualization
Week 3	Cloud Storage and Database Systems
Week 4	Cloud Networking and Security
Week 5	Scalability and Elasticity in the Cloud
Week 6	Cloud Performance Optimization
Week 7	Cloud Cost Management
Week 8	Cloud Service-Level Agreements (SLAs) and Governance
Week 9	Cloud Migration and Integration
Week 10	Serverless Computing and Function as a Service (FaaS)
Week 11	DevOps and Continuous Integration/Deployment (CI/CD) in the Cloud
Week 12	Containers and Container Orchestration
Week 13	Big Data and Analytics in the Cloud
Week 14	Ethical and Legal Considerations in Cloud Computing
Week 15	Emerging Trends and Future of Cloud Computing
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	Lab 1: Introduction to Coding Theory
Week 2	Lab 2: Data Compression Techniques
Week 3	Lab 3: Implement channel coding schemes
Week 4	Lab 4: basic cryptographic techniques
Week 5	Lab 5 :Investigate the relationship between entropy and data compression
Week 6	Lab 6: Error detection and correction mechanisms in network protocols
Week 7	Lab 7: Practical Applications of Coding and Information Theory

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Cloud Computing: A Hands-On Approach" by Arshdeep Bahga and Vijay Madisetti (2019).	Yes
Recommended Texts	"Cloud Computing: From Beginning to End" by Ray Jezzini (2017).	No
Websites	https://www.coursera.org/learn/introduction-to-cloud	

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	**الترميز ونظرية المعلومات**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CYBS-301**				
ECTS Credits	**8**				
SWL (hr/sem)	**150**				
Module Level	3		**Semester of Delivery**	1	
Administering Department			**College**		
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	7. Gain a solid understanding of the fundamental concepts and principles of coding theory and information theory. 8. Learn various coding techniques used for error detection, error correction, data compression, and encryption. 9. Develop practical skills by implementing coding algorithms and techniques in programming languages to solve real-world problems. 10. Explore different error detection and correction codes and techniques, such as Hamming codes, Reed-Solomon codes, and convolutional codes, and understand their applications in reliable data transmission. 11. Gain insights into the concept of channel capacity and understand how coding theory can be used to achieve reliable communication over noisy channels. 12. Explore practical applications of coding and information theory in various fields, such as telecommunications, data storage, wireless communication, and network security.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	13. Students will have a strong understanding of various coding techniques used for error detection, error correction, data compression, and encryption. 14. Students will be able to design and implement coding algorithms in programming languages to solve practical problems. 15. Students will be skilled in detecting and correcting errors in data transmission. 16. Students will have an introductory understanding of quantum information theory, quantum error correction, and quantum cryptography. 17. They can contribute to the development and implementation of coding schemes in real-world systems 18. They will be prepared for careers in telecommunications, data science, cryptography, network security, and other related fields where coding and information theory play a crucial role
Indicative Contents المحتويات الارشادية	Indicative content includes the following. Coding Theory: The study of methods and techniques for representing and transmitting data efficiently and reliably, particularly through the use of error detection and correction codes.

	Information Theory: The branch of mathematics and computer science that deals with quantifying and measuring information, including the study of data compression, communication, and the fundamental limits of data processing. Entropy: A measure of the average amount of information or uncertainty in a random variable or data source. It represents the minimum average number of bits required to encode the information. Source Coding: The process of compressing data to reduce redundancy and decrease its size for efficient storage or transmission, while maintaining the ability to reconstruct the original data accurately. Channel Coding: The process of adding redundancy to data before transmission over a noisy channel to enable error detection and correction at the receiver, improving the reliability of the communication. Error Detection: The process of detecting errors or changes in data caused by noise, interference, or other factors during transmission or storage. Error Correction: The process of identifying and correcting errors in data, usually achieved through the use of error correction codes that can recover the original data even if some errors occur. Block Codes: Error correction codes that operate on fixed-sized blocks of data, adding redundancy to the data to enable error detection and correction.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	In a Coding and Information Theory course, effective learning and teaching strategies can include a combination of theoretical understanding and practical implementation. Strategies may involve lectures to introduce coding techniques and information theory concepts, hands-on coding exercises to reinforce learning, group projects to encourage collaboration and problem-solving skills, real-world case studies to showcase practical applications, interactive discussions to explore advanced topics, and regular assessments to gauge student understanding. These strategies aim to provide students with a solid

	foundation in coding theory and information theory, along with practical coding skills for various applications.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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
Week 1	Introduction to Coding and Information Theory
Week 2	Binary Codes and Error Detection
Week 3	Linear Codes and Error Correction
Week 4	Convolutional Codes
Week 5	Source Coding and Huffman Coding
Week 6	Arithmetic Coding and Lempel-Ziv-Welch (LZW) Compression
Week 7	Channel Capacity and Shannon's Theorem
Week 8	Error-Correcting Codes and Channel Coding
Week 9	Burst and Random Error Correction
Week 10	Cryptography and Error Correction
Week 11	Advanced Topics in Coding Theory
Week 12	Introduction to Quantum Information Theory
Week 13	Quantum Error Correction
Week 14	Quantum Cryptography
Week 15	Review, Project Presentations, and Practical Wrap-up
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	Lab 1: Introduction and cabling
Week 2	Lab 2: : Server Administrator – users and groups
Week 3	Lab 3: Server Administrator – Security Options
Week 4	Lab 4: Server Administrator – Files, Printer and Hard disk Management
Week 5	Lab 5: How to build a complete networks in Packet Tracer
Week 6	Lab 6: How to build a complete networks in Packet Tracer
Week 7	Lab 7: DHCP Server/ DNS Server - Packet Tracer

Week 8	Lab 7: HTTP protocol / E-Mail Server - Packet Tracer

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	“A Student's Guide to Coding and Information Theory” , by Stefan M. Moser, Po-Ning , 2012	No
Recommended Texts	"Information Theory, Coding, and Cryptography" by Ranjan Bose, 2008	No
Websites	https://www.coursera.org/learn/information-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	القرصنة الاخلاقية			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CMCs25_F32071**				
Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	3		**Semester of Delivery**	2	
Administering Department			**College**		
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	The module objectives of Ethical Hacking may include: Understanding Ethical Hacking: Gain a comprehensive understanding of the concepts, principles, and methodologies of ethical hacking. Learn about the ethical and legal considerations involved in conducting hacking activities for security assessment purposes. Information Gathering and Footprinting: Develop skills in gathering information about target systems and networks, including footprinting, reconnaissance, and open-source intelligence (OSINT) techniques. Understand how to analyze and use this information for vulnerability identification. Scanning and Enumeration: Learn various scanning and enumeration techniques to identify open ports, services, and vulnerabilities on target systems. Understand how to use tools and techniques such as port scanning, banner grabbing, and service enumeration. Vulnerability Assessment: Develop skills in assessing the security vulnerabilities of target systems and networks. Learn how to identify and analyze common vulnerabilities, such as misconfigurations, weak passwords, outdated software, and insecure network configurations. Exploitation Techniques: Gain knowledge of exploitation techniques to validate vulnerabilities and demonstrate their impact. Learn about common exploit frameworks and tools used to exploit vulnerabilities, such as Metasploit. Password Cracking: Understand the techniques and tools used for password cracking. Learn about password hashing, salting, and password cracking methods, such as brute-force attacks, dictionary attacks, and rainbow tables. Social Engineering: Explore social engineering techniques used to exploit human vulnerabilities and gain unauthorized access to systems. Understand how to identify and defend against social engineering attacks, such as phishing, pretexting, and baiting. Web Application Security: Gain knowledge of common web application vulnerabilities and how to identify and exploit them. Learn about techniques such as SQL injection, cross-site scripting (XSS), and session hijacking. Wireless Network Security: Understand the security vulnerabilities associated with wireless networks. Learn about wireless encryption protocols, wireless sniffing, and cracking techniques, and explore methods to secure wireless networks. Reporting and Risk Mitigation: Develop skills in documenting and reporting findings from ethical hacking activities. Understand the importance of clear and concise reporting and learn how to provide recommendations for risk mitigation and remediation. By achieving these module objectives, students will gain a solid foundation in ethical hacking principles, techniques, and tools. They will be able to identify and exploit vulnerabilities, assess the security posture of systems and networks, and provide recommendations for enhancing security and mitigating risks.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The module learning outcomes of Ethical Hacking may include: Knowledge of Ethical Hacking Principles: Demonstrate a thorough understanding of the principles, ethics, and legal considerations associated with ethical hacking. Understand the importance of consent, confidentiality, and responsible use of hacking techniques. Technical Proficiency: Develop technical skills in various areas of ethical hacking, including information gathering, vulnerability assessment, exploit development, and penetration testing. Gain proficiency in using hacking tools, frameworks, and techniques. Vulnerability Identification and Analysis: Identify and analyze vulnerabilities in systems, networks, and applications. Understand different types of vulnerabilities and their impact on security. Develop the ability to prioritize and assess the severity of vulnerabilities. Exploitation and Penetration Testing: Gain practical experience in exploiting vulnerabilities to demonstrate their impact. Perform penetration testing activities to assess the security posture of target systems and networks. Develop proficiency in exploiting common vulnerabilities and misconfigurations. Risk Assessment and Reporting: Assess the risks associated with identified vulnerabilities and provide recommendations for risk mitigation. Develop the ability to prepare comprehensive and actionable reports that clearly communicate findings, risks, and recommendations to stakeholders. Web Application Security: Understand the vulnerabilities and security challenges specific to web applications. Gain knowledge of common web application vulnerabilities, such as SQL injection, cross-site scripting (XSS), and insecure session management. Develop skills in assessing and securing web applications. Network Security Assessment: Perform network reconnaissance, scanning, and enumeration activities to identify security weaknesses. Gain knowledge of network protocols, services, and common vulnerabilities. Develop the ability to assess network security and recommend appropriate controls. Password Security and Cracking: Understand password security mechanisms, including encryption, hashing, and salting. Develop skills in password cracking techniques and tools. Understand the importance of strong password policies and practices. Social Engineering Awareness: Gain awareness of social engineering techniques and the impact they can have on security. Develop skills in recognizing and defending against social engineering attacks. Understand the importance of security awareness training for end-users. Compliance and Ethical Considerations: Understand compliance requirements and ethical considerations related to ethical hacking activities. Develop an awareness of legal frameworks, regulations, and industry standards relevant to ethical hacking. By achieving these module learning outcomes, students will be equipped with the knowledge, skills, and ethical mindset necessary to effectively perform ethical hacking activities. They will be able to identify vulnerabilities, assess risks, and provide actionable recommendations to enhance the security posture of systems and networks.
Indicative Contents المحتويات الارشادية	The indicative contents of a module on Ethical Hacking may include: Introduction to Ethical Hacking Understanding ethical hacking and its purpose

	Differentiating ethical hacking from malicious hacking Legal and ethical considerations in ethical hacking Footprinting and Reconnaissance Gathering information about target systems and networks Using open-source intelligence (OSINT) techniques Conducting network and system footprinting Scanning and Enumeration Identifying live hosts and open ports Enumerating services and vulnerabilities Using scanning tools and techniques System Hacking Exploiting system vulnerabilities Privilege escalation techniques Maintaining access and covering tracks Web Application Security Understanding web application vulnerabilities Common web application attacks (SQL injection, XSS, etc.) Assessing and securing web applications Network Hacking Network infrastructure vulnerabilities Man-in-the-middle attacks Network sniffing and protocol analysis Wireless Network Security Wireless network vulnerabilities Cracking wireless encryption Securing wireless networks Social Engineering Understanding social engineering techniques Phishing attacks and prevention Social engineering awareness and defense Cryptography and Password Cracking Principles of encryption and cryptographic algorithms Password security and cracking techniques Hashing, salting, and password storage best practices Vulnerability Assessment and Penetration Testing (VAPT) Performing vulnerability assessments Conducting penetration testing Reporting and remediation recommendations Mobile Security Mobile device vulnerabilities Mobile application security Securing mobile devices and apps Emerging Trends and Technologies Cloud security considerations Internet of Things (IoT) security Blockchain security Please note that these contents are indicative and may vary depending on the specific curriculum and institution offering the module. The module may also include

	practical hands-on exercises, case studies, and real-world scenarios to enhance learning and practical skills in ethical hacking.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	Strategies for conducting ethical hacking activities include: Obtain Proper Authorization: Ensure that you have explicit permission from the organization or individual that owns the systems you will be testing. This may involve obtaining written consent or signing a legally binding agreement. Define the Scope: Clearly define the scope of the ethical hacking engagement. Identify the systems, networks, or applications that are within the scope and those that are off-limits. This helps prevent any unintended damage or unauthorized access. Conduct Information Gathering: Gather relevant information about the target systems or networks. This includes conducting reconnaissance, gathering publicly available information, and understanding the technology stack and potential vulnerabilities. Vulnerability Assessment: Perform a systematic evaluation of the target systems and networks to identify potential vulnerabilities. Use scanning tools, manual testing techniques, and vulnerability databases to identify weaknesses. Exploit Validation: Once vulnerabilities are identified, validate their impact by attempting to exploit them. This helps determine the severity and potential consequences of the vulnerabilities and confirms if they are truly exploitable. Reporting and Documentation: Document and report all findings in a clear and concise manner. Include detailed information about identified vulnerabilities, their impact, and recommendations for mitigation. Provide evidence and proof of concept, where applicable. Communication and Collaboration: Maintain effective communication with the organization or individual throughout the ethical hacking process. Share progress, findings, and recommendations regularly and seek clarification or additional information as needed. Responsible Disclosure: Follow responsible disclosure practices by sharing vulnerability information with the organization or individual in a responsible and secure manner. Provide sufficient time for them to address the vulnerabilities before disclosing them publicly. Continuous Learning and Improvement: Stay updated with the latest hacking techniques, tools, and security trends. Participate in relevant training, certifications, and conferences to enhance your knowledge and skills. Continuously improve your ethical hacking methodologies and processes. Maintain Confidentiality and Integrity: Handle all sensitive information obtained during ethical hacking activities with utmost care. Ensure that data and findings are kept confidential and securely stored. Respect privacy and comply with legal and ethical guidelines.

	By following these strategies, ethical hackers can conduct their activities in a professional, responsible, and ethical manner. These strategies help ensure that the focus is on identifying vulnerabilities, improving security, and protecting the interests of the organization or individual being tested. Top of Form

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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.	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 Ethical Hacking
Week 2	Networking Fundamentals
Week 3	Information Gathering and Footprinting
Week 4	Scanning and Enumeration
Week 5	System Hacking
Week 6	Web Application Security
Week 7	Wireless Network Security
Week 8	Cryptography and Cryptanalysis
Week 9	Social Engineering
Week 10	Vulnerability Assessment and Penetration Testing
Week 11	Exploitation and Post-Exploitation
Week 12	Wireless Security and Mobile Hacking
Week 13	Network Security and Firewall Bypassing
Week 14	Social Engineering and Physical Security
Week 15	Final Project Presentations and Review
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	Introduction to Ethical Hacking Practice
Week 2	Information Gathering and Footprinting Practice
Week 3	Scanning and Enumeration Practice
Week 4	Web Application Security Practice
Week 5	Wireless Network Security Practice
Week 6	System Hacking Practice
Week 7	Vulnerability Assessment and Penetration Testing Practice

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	"The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws" by Dafydd Stuttard and Marcus Pinto. This book provides an in-depth guide to web application security and covers various aspects of ethical hacking. It offers practical insights into identifying, exploiting, and securing web application vulnerabilities. The book covers topics such as mapping the application, analyzing vulnerabilities, bypassing security controls, and discovering flaws in authentication, session management, and input validation.	
Recommended Texts	"Hacking: The Art of Exploitation" by Jon Erickson. This book provides a comprehensive introduction to the world of hacking, covering both the technical and conceptual aspects. It explores various hacking techniques, tools, and methodologies, focusing on the mindset and skills required to think like a hacker.	
Websites	OWASP (Open Web Application Security Project): www.owasp.org - OWASP is a non-profit organization dedicated to improving the security of software and web applications. Their	

	website offers a wealth of information, tools, and resources related to web application security and ethical hacking.

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	بروتوكولات الاتصالات الأمنة			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CMCs25_F32061**				
Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	3		**Semester of Delivery**	2	
Administering Department			**College**		
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	The module objectives of Protocols for Secure Communication may include: Understanding Secure Communication Protocols: Gain a thorough understanding of the principles, concepts, and mechanisms used in secure communication protocols. Learn about various protocols and their roles in establishing secure communication channels. Analyzing Security Requirements: Identify and analyze the security requirements for secure communication, such as confidentiality, integrity, authentication, and non-repudiation. Understand the importance of these requirements in designing secure communication protocols. Evaluating Existing Protocols: Study and evaluate existing secure communication protocols, such as SSL/TLS, IPsec, SSH, and S/MIME. Examine their strengths, weaknesses, and vulnerabilities, and understand the trade-offs involved in their design. Cryptographic Algorithms and Protocols: Understand the cryptographic algorithms and protocols used in secure communication. Learn about symmetric and asymmetric encryption, digital signatures, key exchange protocols, and secure hash functions. Designing Secure Communication Protocols: Develop the skills to design and develop secure communication protocols that meet specific security requirements. Understand the principles of protocol design, secure session establishment, secure data transmission, and secure session termination. Threats and Vulnerabilities: Identify and analyze the threats and vulnerabilities associated with secure communication protocols. Explore common attacks, such as man-in-the-middle attacks, replay attacks, and cryptographic attacks, and learn techniques to mitigate these risks. Security Analysis and Testing: Gain the ability to analyze and test the security of secure communication protocols. Learn about formal methods, penetration testing, and vulnerability assessment techniques to identify and address security flaws. Emerging Trends and Technologies: Stay updated with emerging trends and technologies in secure communication protocols. Explore advancements in areas such as quantum-resistant cryptography, secure IoT communication, and blockchain-based protocols. Secure Implementation and Deployment: Understand the considerations and best practices for implementing and deploying secure communication protocols. Learn about secure configuration, certificate management, secure key exchange, and secure protocol integration. Standards and Compliance: Understand the standards and compliance requirements related to secure communication protocols. Explore industry standards, such as PCI DSS, HIPAA, and ISO 27001, and learn how to ensure compliance when implementing secure communication protocols. By achieving these module objectives, students will be equipped with the knowledge and skills to design, analyze, and implement secure communication protocols. They

	will understand the principles and techniques for establishing secure communication channels, mitigating vulnerabilities, and addressing security requirements in various applications and systems. Top of Form
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The module learning outcomes of Protocols for Secure Communication may include: Knowledge of Secure Communication Protocols: Demonstrate a comprehensive understanding of secure communication protocols, including their purpose, functionality, and underlying cryptographic mechanisms. Understanding Security Requirements: Identify and articulate the security requirements necessary for establishing secure communication channels, such as confidentiality, integrity, authentication, and non-repudiation. Evaluation of Protocols: Evaluate and compare different secure communication protocols based on their strengths, weaknesses, and vulnerabilities. Assess their suitability for specific use cases and environments. Design and Development Skills: Develop the skills to design and implement secure communication protocols that address specific security requirements. Apply cryptographic algorithms and techniques to establish secure communication channels. Analysis and Mitigation of Threats: Analyze and assess the threats and vulnerabilities associated with secure communication protocols. Implement appropriate countermeasures and mitigation strategies to protect against attacks. Security Testing and Assessment: Apply security testing techniques and tools to assess the effectiveness and robustness of secure communication protocols. Identify and address security flaws and vulnerabilities. Compliance and Standards Awareness: Understand the industry standards, regulations, and compliance requirements relevant to secure communication protocols. Ensure compliance with applicable standards and implement protocols in alignment with regulatory guidelines. Awareness of Emerging Trends: Stay updated with the latest trends and advancements in secure communication protocols. Understand the implications of emerging technologies and evolving threats on the design and implementation of secure communication solutions. Effective Communication: Communicate technical concepts related to secure communication protocols clearly and effectively. Demonstrate the ability to present and explain complex ideas to technical and non-technical stakeholders. Ethical and Professional Considerations: Recognize and adhere to ethical and professional standards in the design, implementation, and use of secure communication protocols. Understand the legal and privacy implications associated with secure communication. By achieving these module learning outcomes, students will possess the knowledge and skills necessary to design, evaluate, and implement secure communication protocols. They will be able to assess security requirements, mitigate threats, ensure compliance, and adapt to emerging trends in the field of secure communication. Top of Form
Indicative Contents	The indicative contents of a module on Protocols for Secure Communication may include:

المحتويات الارشادية	Introduction to Secure Communication Overview of secure communication protocols Importance of secure communication in protecting data Cryptographic Foundations Symmetric and asymmetric encryption algorithms Digital signatures and hash functions Key management and secure key exchange Secure Socket Layer (SSL)/Transport Layer Security (TLS) SSL/TLS protocol overview Handshake protocol for session establishment Record protocol for secure data transmission SSL/TLS vulnerabilities and countermeasures Internet Protocol Security (IPsec) IPsec architecture and components Authentication and encryption mechanisms IPsec key management IPsec tunnel and transport modes Secure Email Communication Overview of secure email protocols (S/MIME and PGP) Email encryption and digital signatures Public key infrastructure (PKI) for email security Secure File Transfer Protocol (SFTP) and Secure Shell (SSH) SFTP protocol for secure file transfer SSH protocol for secure remote login SSH key-based authentication and secure tunneling Virtual Private Networks (VPNs) VPN concepts and types (site-to-site, remote access) VPN protocols (IPsec-based, SSL-based) VPN deployment considerations and best practices Secure Web Communication HTTPS and HTTP/2 protocols SSL/TLS deployment for web applications Web security considerations (session management, cross-site scripting, etc.) Wireless Security Protocols Wi-Fi security protocols (WPA2, WPA3) IEEE 802.1X/EAP for secure wireless access Wireless security vulnerabilities and mitigation techniques Emerging Trends in Secure Communication Post-quantum cryptography Blockchain and distributed ledger technology for secure communication IoT security protocols and challenges Please note that these are indicative contents and the actual curriculum may vary depending on the institution and specific course requirements. The module may also include practical exercises, case studies, and hands-on implementation of secure communication protocols. Top of Form

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	Strategies for implementing protocols for secure communication include: Encryption: Implement strong encryption algorithms to protect the confidentiality of data during transmission. This involves encrypting the data using cryptographic keys and ensuring that only authorized parties have access to the keys. Authentication: Use authentication mechanisms to verify the identity of communicating parties. This can involve techniques such as digital certificates, public key infrastructure (PKI), or username/password authentication to ensure that both parties are who they claim to be. Secure Key Exchange: Establish secure methods for exchanging encryption keys between communicating parties. This ensures that the keys are not compromised during transmission and that only authorized parties have access to the keys. Data Integrity: Implement mechanisms to ensure the integrity of transmitted data. This can involve techniques such as cryptographic hash functions or message authentication codes (MACs) to detect any unauthorized modifications or tampering of the data during transmission. Secure Protocols: Use secure communication protocols that have been designed and implemented with security in mind. Common examples include SSL/TLS for web communication, IPsec for network communication, and S/MIME for email communication. Security Auditing and Monitoring: Regularly audit and monitor the secure communication protocols and systems to detect any vulnerabilities or anomalies. This can involve analyzing logs, conducting penetration testing, and implementing intrusion detection and prevention systems (IDPS). Regular Updates and Patching: Stay up to date with the latest security patches and updates for the protocols and systems used for secure communication. This helps ensure that any known vulnerabilities or weaknesses are addressed promptly. Training and Awareness: Provide training and awareness programs for users and administrators to educate them about secure communication practices, such as recognizing phishing attempts, using secure protocols, and safeguarding encryption keys. Compliance with Standards and Regulations: Ensure that the protocols and systems used for secure communication comply with relevant industry standards and regulations, such as PCI DSS, HIPAA, or GDPR. This helps ensure that security requirements and best practices are followed. Incident Response and Recovery: Have an incident response plan in place to handle security incidents or breaches related to secure communication protocols. This includes procedures for identifying and mitigating security threats, restoring secure communication channels, and recovering from any potential damage. These strategies help organizations establish and maintain secure communication channels while mitigating potential vulnerabilities and risks associated with data transmission. Top of Form

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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.	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 Secure Communication Protocols
Week 2	Secure Socket Layer (SSL) and Transport Layer Security (TLS)
Week 3	Public Key Infrastructure (PKI)
Week 4	Secure Email Protocols

Week 5	Virtual Private Networks (VPNs)
Week 6	Secure File Transfer Protocols
Week 7	Secure Web Communication
Week 8	Secure Voice and Video Communication
Week 9	Secure Instant Messaging
Week 10	Secure DNS and DNSSEC
Week 11	Secure IoT Communication
Week 12	Secure Mobile Communication
Week 13	Secure Social Media and Collaboration
Week 14	Blockchain and Secure Communication
Week 15	Final Project Presentations and Review
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	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	"Cryptography and Network Security: Principles and Practice" by William Stallings. This book provides a comprehensive overview of cryptography and network security, including protocols for secure communication. It covers topics such as encryption,	

	authentication, key management, secure socket layer (SSL)/transport layer security (TLS), virtual private networks (VPNs), and wireless security protocols.	
Recommended Texts	SSL and TLS: Designing and Building Secure Systems" by Eric Rescorla. This book provides an in-depth exploration of the Secure Sockets Layer (SSL) and Transport Layer Security (TLS) protocols, which are widely used for securing communication over the Internet. It covers the history, design principles, and technical details of SSL/TLS protocols, including their cryptographic algorithms, handshaking process, and record layer.	
Websites	Transport Layer Security (TLS) Working Group: www.ietf.org/wg/tls/: The TLS Working Group is a part of the Internet Engineering Task Force (IETF) and is responsible for developing and maintaining the TLS protocol. Their website provides access to RFCs (Request for Comments), drafts, and other technical documents related to TLS.	

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	التوعية والتدريب في الامن			**Module Delivery**	
Module Type	C			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CYBS-310				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		3	**Semester of Delivery**		2
Administering Department			**College**		
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	The primary objective of an Awareness and Training for Security module is to educate and train employees on the importance of security best practices and how to identify and respond to potential security threats. Other objectives of this module may include: 1. Understanding the organization's security policies and procedures. 2. Understanding how to identify and report security incidents. 3. Understanding the risks associated with phishing, social engineering, and other common cyber attacks. 4. Learning how to create strong passwords and manage them securely. 5. Understanding the importance of data privacy and how to handle sensitive information securely. 6. Learning how to securely connect to the organization's network from remote locations. 7. Understanding the importance of regular software updates and patching. 8. Learning how to use security tools such as firewalls, antivirus software, and intrusion detection systems. 9. Understanding the basics of cryptography and encryption. 10. Understanding the importance of incident response and how to respond to a security incident. Overall, the main objective of an Awareness and Training for Security module is to create a security-aware culture within the organization and empower employees to be an active part of the organization's security strategy.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The learning outcomes of an Awareness and Training for Security module will vary depending on the specific goals and objectives of the module. However, here are some common learning outcomes that can be expected from such a module: 1. Employees will be able to identify and report potential security incidents. 2. Employees will understand the risks associated with common cyber attacks and know how to protect against them. 3. Employees will be able to create strong passwords and manage them securely. 4. Employees will understand the importance of data privacy and how to handle sensitive information securely. 5. Employees will be able to securely connect to the organization's network from remote locations. 6. Employees will understand the importance of regular software updates and patching. 7. Employees will be able to use security tools such as firewalls, antivirus software, and intrusion detection systems. 8. Employees will understand the basics of cryptography and encryption.

	9. Employees will understand the importance of incident response and know how to respond to a security incident. 10. Employees will be aware of the organization's security policies and procedures and understand their role in maintaining a secure environment. Overall, the learning outcomes of an Awareness and Training for Security module should help to create a culture of security awareness within the organization and empower employees to take an active role in protecting the organization's assets and sensitive information.
Indicative Contents المحتويات الارشادية	The contents of an Awareness and Training for Security module will vary depending on the specific needs of the organization. However, here are some common topics that may be covered: 1. The importance of security awareness: This may include an introduction to the risks associated with cyber attacks and the importance of maintaining a secure environment. 2. Security policies and procedures: Employees will learn about the organization's security policies and procedures, including access controls, password policies, and incident response procedures. 3. Phishing and social engineering: Employees will learn how to identify and respond to phishing emails, phone calls, and other social engineering attacks. 4. Password security: This may include information on creating strong passwords, using password managers, and avoiding password reuse. 5. Data privacy: Employees will learn about the importance of protecting sensitive information, including personal data and confidential business information. 6. Remote access security: Employees will learn how to securely connect to the organization's network from remote locations, including the use of virtual private networks (VPNs). 7. Security tools: This may include an introduction to firewalls, antivirus software, and intrusion detection and prevention systems. 8. Cryptography and encryption: Employees will learn about the basics of cryptography and encryption and how they are used to protect sensitive information. 9. Incident response: Employees will learn about the importance of incident response and how to respond to a security incident. 10. Security best practices: This may include information on regular software updates and patching, secure web browsing, safe email practices, and mobile device security. Overall, the contents of an Awareness and Training for Security module should provide employees with a comprehensive understanding of security risks and best practices and empower them to take an active role in maintaining a secure environment.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	Effective strategies of Awareness and Training for Security can help to create a security-aware culture within the organization and empower employees to take an active role in maintaining a secure environment. Here are some common strategies that can be employed:

	1. Regular training sessions: Conducting regular training sessions on security best practices can help to keep security awareness at the forefront of employees' minds. 2. Interactive training materials: Using interactive training materials such as quizzes, games, and simulations can help to engage employees and increase the effectiveness of the training. 3. Tailored training: Tailoring training programs to specific job roles or departments can help to ensure that employees receive training that is relevant to their responsibilities. 4. Senior management support: Gaining the support of senior management can help to emphasize the importance of security awareness within the organization and encourage employees to take it seriously. 5. Continuous reinforcement: Reinforcing security best practices through regular reminders and updates can help to keep security awareness top of mind. 6. Benchmarking: Regularly benchmarking the effectiveness of security awareness training programs can help to identify areas for improvement and ensure that training programs remain up-to-date. 7. Phishing simulations: Conducting phishing simulations can help to educate employees on how to identify and respond to phishing attacks. 8. Incentives: Providing incentives for employees who demonstrate good security practices can help to encourage security awareness and promote a security-aware culture. 9. Multi-lingual training: Providing training materials in multiple languages can help to ensure that all employees, regardless of their language background, receive the necessary training. Overall, the strategies of Awareness and Training for Security should be tailored to the specific needs of the organization and its employees, and regularly updated to remain effective and relevant.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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.	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	Advanced Security Awareness Training Techniques
Week 2	Interactive training methods (e.g., gamification, simulations)
Week 3	Security awareness for remote and distributed teams
Week 4	Measuring and evaluating the effectiveness of security training
Week 5	Emerging Threats Awareness
Week 6	Exploring emerging cybersecurity threats
Week 7	Ransomware and malware awareness
Week 8	Advanced persistent threats (APTs) and targeted attacks
Week 9	Cloud Security Awareness
Week 10	Understanding cloud computing security challenges
Week 11	Security considerations for cloud services and deployments
Week 12	Cloud security awareness training
Week 13	Mobile Device Security Awareness
Week 14	Mobile device security risks and vulnerabilities

Week 15	Best practices for securing mobile devices, Mobile device security awareness training
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	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	"The Art of Human Hacking" by Christopher Hadnagy.	
Recommended Texts	"Social Engineering: The Art of Human Hacking" by Christopher Hadnagy.	
Websites	SANS Security Awareness: www.sans.org/security-awareness: SANS Institute offers a comprehensive security awareness training program that covers a wide range of topics, including phishing awareness, password security, social engineering, and safe online behavior. Their website provides access to free resources, blog articles, and information on training courses and certifications.	

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	أمن قواعد البيانات			**Module Delivery**	
Module Type	C			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	CYBS-309				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	3		**Semester of Delivery**	2	
Administering Department			**College**		
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	The module objectives of a course on database security typically include: Understanding Database Security Fundamentals: Gain a solid understanding of the basic principles and concepts of database security. Learn about the importance of protecting data assets, the threats and vulnerabilities that databases face, and the impact of security breaches. Securing Database Access: Learn how to implement and manage secure access controls for databases. Explore authentication and authorization mechanisms, user management, and role-based access control (RBAC). Understand the importance of least privilege and separation of duties in ensuring data confidentiality and integrity. Database Encryption and Cryptography: Study encryption techniques and cryptographic algorithms used in database security. Learn how to apply encryption at rest and in transit to protect sensitive data from unauthorized access. Explore key management and secure storage of cryptographic keys. Database Auditing and Monitoring: Understand the importance of database auditing and monitoring for detecting and responding to security incidents. Learn about audit trails, event logging, and intrusion detection systems (IDS) specific to databases. Explore techniques for analyzing logs and detecting suspicious activities. Database Security Administration: Acquire knowledge and skills related to the administration of database security. Learn how to configure security settings, manage database privileges, and monitor user activities. Understand the role of database administrators in ensuring the overall security posture of a database system. Database Backup and Recovery: Understand the significance of database backup and recovery in the context of security. Learn how to design and implement secure backup and recovery strategies to protect against data loss and ensure business continuity. Security Assessment and Vulnerability Management: Explore techniques for assessing the security of database systems and identifying vulnerabilities. Learn how to perform security assessments, vulnerability scanning, and penetration testing on databases. Understand the importance of patch management and staying updated with security patches. Database Security Best Practices: Gain insights into industry best practices and standards for securing databases. Learn about secure coding practices, secure configuration management, and secure development lifecycle (SDLC) considerations specific to databases. Understand regulatory and compliance requirements relevant to database security. Database Security Controls and Technologies: Study various security controls and technologies available for enhancing database security. This may include database activity monitoring (DAM) tools, database firewall systems, and database encryption solutions. Understand their features, deployment considerations, and integration with existing security infrastructure.

	Database Security Incident Response: Develop skills for effectively responding to and managing database security incidents. Learn incident response procedures, forensic techniques for investigating database breaches, and incident handling best practices. By achieving these module objectives, students will gain a comprehensive understanding of database security principles, technologies, and practices, and be equipped with the skills necessary to design, implement, and manage secure database systems. Top of Form
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The module learning outcomes for a course on database security may include: Knowledge and Understanding: Gain a deep understanding of the fundamental concepts, principles, and theories related to database security. Develop knowledge of the various threats, vulnerabilities, and risks that databases face, as well as the techniques and technologies used to mitigate those risks. Application of Security Measures: Apply appropriate security measures and controls to protect databases from unauthorized access, data breaches, and other security threats. Demonstrate the ability to implement access controls, encryption mechanisms, and secure configuration settings to safeguard data integrity and confidentiality. Security Assessment and Risk Management: Perform security assessments, vulnerability scans, and risk analyses to identify potential weaknesses in database systems. Utilize industry-standard tools and methodologies to assess security risks and implement effective risk management strategies. Secure Access Control Implementation: Design and implement robust access control mechanisms for databases, including authentication, authorization, and privilege management. Demonstrate proficiency in implementing role-based access control (RBAC) and enforcing the principle of least privilege. Data Protection and Encryption: Apply encryption techniques to protect sensitive data at rest and in transit. Understand different encryption algorithms, key management strategies, and cryptographic protocols used in database security. Implement encryption measures to ensure data confidentiality and integrity. Security Incident Detection and Response: Develop skills in detecting and responding to security incidents in database systems. Demonstrate the ability to monitor and analyze audit logs, use intrusion detection systems (IDS), and employ incident response procedures to mitigate the impact of security breaches. Compliance and Regulatory Compliance: Understand the regulatory and compliance requirements related to database security, such as data protection laws, industry standards, and privacy regulations. Ensure compliance with relevant regulations and demonstrate an understanding of the legal and ethical implications of database security. Secure Database Administration: Demonstrate proficiency in secure database administration practices, including user management, privilege management, and secure configuration management. Understand the responsibilities of database administrators in maintaining the security of database systems. Secure Database Backup and Recovery: Implement secure backup and recovery strategies for databases to ensure data availability and business continuity. Understand the importance of data backups, backup encryption, and recovery procedures in database security.

	Critical Thinking and Problem Solving: Apply critical thinking skills to analyze complex database security issues and propose effective solutions. Develop problem-solving abilities to address security challenges in database systems and make informed decisions to mitigate risks. By achieving these module learning outcomes, students will be equipped with the necessary knowledge, skills, and abilities to design, implement, and manage secure database systems, ensuring the confidentiality, integrity, and availability of data
Indicative Contents المحتويات الارشادية	The indicative contents of a course on database security may include: Introduction to Database Security Importance of database security Key concepts and terminology Common security threats and vulnerabilities in databases Access Control and Authentication User authentication and authorization Role-based access control (RBAC) Access control models and policies Granular access control mechanisms Encryption and Cryptography in Databases Encryption algorithms and techniques Encryption at rest and in transit Key management and secure key storage Database encryption best practices Secure Database Design and Configuration Secure database architecture Secure configuration settings Secure storage and transmission of data Secure coding practices for database applications Database Auditing and Monitoring Database audit trails and logs Database activity monitoring (DAM) Intrusion detection and prevention in databases Database security monitoring tools and techniques Database Backup and Recovery Database backup strategies and mechanisms Secure storage and transmission of backups Backup encryption and integrity verification Database recovery procedures and practices Database Security Assessment and Vulnerability Management Security assessment methodologies Vulnerability scanning and assessment tools Penetration testing of databases Patch management and vulnerability remediation Data Privacy and Regulatory Compliance Data protection regulations and laws Privacy considerations in database security Compliance frameworks and standards (e.g., GDPR, HIPAA) Best practices for ensuring data privacy and compliance

	Database Security Incident Response Incident response planning and procedures Detection and analysis of database security incidents Incident containment and mitigation strategies Forensic techniques for investigating database breaches Emerging Trends in Database Security Cloud database security Big data security considerations Mobile database security Internet of Things (IoT) and database security These indicative contents provide a broad overview of the topics typically covered in a database security course. The actual content and depth of coverage may vary depending on the specific course, curriculum, and instructor. Top of Form

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	Strategies for implementing effective database security include: Access Control: Implement strong access control mechanisms to restrict unauthorized access to the database. This involves enforcing strong authentication mechanisms, such as usernames and passwords, and using techniques like role-based access control (RBAC) to assign appropriate privileges to users based on their roles and responsibilities. Encryption: Utilize encryption techniques to protect sensitive data stored in the database. This includes encrypting data at rest (stored on disk or in backups) and data in transit (transmitted over networks) to ensure confidentiality. Encryption should be applied to both the data itself and sensitive information such as credentials and encryption keys. Secure Database Design: Follow secure design principles when creating the database schema and defining data structures. This includes implementing proper normalization, adhering to the principle of least privilege by assigning minimal access rights to users, and carefully defining table relationships to avoid vulnerabilities like SQL injection. Regular Patching and Updates: Keep the database software and associated tools up to date by applying security patches and updates. Vendors regularly release patches to address vulnerabilities and improve security. Regularly updating the database software reduces the risk of known exploits being used to compromise the system. Database Activity Monitoring: Deploy monitoring tools and techniques to track and analyze database activity. This includes logging and auditing user activities, detecting anomalies, and generating alerts for suspicious behavior. Monitoring can help identify potential security breaches and support incident response efforts. Backup and Recovery: Implement robust backup and recovery strategies to ensure the availability and integrity of data. Regularly back up the database and store backups securely, separate from the production environment. Test backup

	restoration procedures periodically to ensure data can be recovered in case of data loss or system compromise. Security Awareness and Training: Educate database administrators, developers, and users about security best practices and potential risks. This includes training on secure coding practices, data handling procedures, and awareness of social engineering attacks. Regular training helps maintain a security-conscious culture and reduces the likelihood of security breaches due to human error. Vulnerability Assessment and Penetration Testing: Conduct regular vulnerability assessments and penetration testing to identify weaknesses in the database system. This involves using automated tools and manual techniques to identify vulnerabilities and assess the effectiveness of security controls. Remediate identified vulnerabilities to strengthen the security posture. Compliance and Regulatory Considerations: Understand and comply with relevant data protection regulations, industry standards, and organizational policies. This may include adhering to requirements such as the General Data Protection Regulation (GDPR), Payment Card Industry Data Security Standard (PCI DSS), or specific industry- specific regulations. Compliance ensures the database security measures align with legal and regulatory obligations. Incident Response Planning: Develop a comprehensive incident response plan that outlines the steps to be taken in the event of a security breach or incident. The plan should include procedures for containment, investigation, communication, and recovery. Regularly review and test the incident response plan to ensure its effectiveness. By implementing these strategies, organizations can enhance the security of their databases and protect sensitive data from unauthorized access, integrity issues, and other security threats. It is important to customize these strategies based on specific organizational requirements, industry best practices, and emerging security threats. Top of Form

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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.	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 Security
Week 2	Database Access Control
Week 3	Encryption and Cryptographic Techniques
Week 4	Data Integrity and Consistency
Week 5	SQL Injection and Web Application Security
Week 6	Database Firewalls and Intrusion Detection Systems
Week 7	Database Auditing and Monitoring
Week 8	Secure Database Design
Week 9	Security Assessment and Vulnerability Management
Week 10	Database Backup and Recovery
Week 11	Database Security Policies and Compliance

Week 12	Database Security in the Cloud
Week 13	Emerging Trends in Database Security
Week 14	Case Studies and Best Practices
Week 15	Final Project Presentations and Review
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	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	"Database Security and Auditing: Protecting Data Integrity and Accessibility" by Hassan A. Afyouni.	
Recommended Texts	"Database Security: Concepts, Approaches, and Challenges" by Bhavani Thuraisingham.	
Websites	Oracle Database Security - www.oracle.com/database/security: Oracle's official website offers a dedicated section on database security, providing comprehensive information on various security features and best practices for Oracle Database. It includes whitepapers, case studies, and documentation on topics like encryption, access control, auditing, and secure configuration.	

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	أمن الشبكات والهواتف			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CMCs25_F32031**				
Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	3		**Semester of Delivery**	2	
Administering Department			**College**		
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	The main objective of a network security module is to ensure the confidentiality, integrity, and availability of data transmitted over a network. This can be achieved by implementing various network security mechanisms such as firewalls, intrusion detection/prevention systems, encryption, access control, and secure protocols. The module aims to equip learners with an understanding of the threats facing network security, their impact on organizations, and the tools and techniques used to mitigate them. Additionally, the module covers topics such as network design principles and security policies to help learners develop a holistic approach to network security.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of a network security module, learners should be able to: Identify common threats to network security and explain their potential impact on organizations. Evaluate and select appropriate security mechanisms for a given network environment. Analyze network design principles and recommend security best practices. Apply encryption, secure protocols, and access control measures to protect against unauthorized access to network resources. Implement and manage firewalls, intrusion detection/prevention systems, and other security technologies to detect and respond to security incidents. Develop and implement security policies and procedures that align with organizational goals and compliance requirements. Monitor and audit network security controls to identify vulnerabilities, threats, and potential risks. Effectively communicate and collaborate with stakeholders regarding network security risks and responses. Continuously evaluate and improve network security measures to ensure the confidentiality, integrity, and availability of network resources. Overall, a network security module should equip learners with the knowledge, skills, and abilities to effectively address network security challenges in a variety of contexts.
Indicative Contents المحتويات الارشادية	1. Firewalls and Antivirus software to protect against unauthorized access and malware. 2. Intrusion Detection Systems (IDS) and Intrusion Prevention Systems (IPS) to monitor network traffic and detect and prevent attacks. 3. Virtual Private Networks (VPNs) to secure remote access to the network. 4. Data Encryption to secure sensitive data during transmission and storage. 5. Access Control to ensure that only authorized users have access to the network and its resources. 6. Security Information and Event Management (SIEM) to collect and analyze security-related data from various sources.

	7. Regular security audits and vulnerability assessments to identify potential security risks. 8. Incident Response Plan to quickly respond and recover from a security breach or attack. 9. User awareness training to educate employees about the importance of security and how to avoid common security risks.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	1. Defense-in-depth: This strategy involves implementing multiple layers of security controls to protect the network. This can include firewalls, intrusion detection and prevention systems, antivirus software, and access controls. 2. Least privilege: This strategy involves giving users the minimum level of access necessary to perform their jobs. This helps to reduce the risk of a data breach caused by human error or malicious intent. 3. Regular software updates and patching: Keeping software up-to-date is important to ensure that security vulnerabilities are addressed. Regular patching can also help to prevent cyber-attacks. 4. Network segmentation: This involves dividing the network into smaller, more secure segments to limit the spread of malware or an attack. 5. Use of strong passwords and multi-factor authentication: Strong passwords and multi-factor authentication can help to prevent unauthorized access to the network. 6. Regular security training and awareness: Educating employees about security best practices and the risks of cyber attacks can help to reduce the likelihood of a successful attack. 7. Incident response planning: Having a plan in place to respond to a security breach can help to minimize the damage and downtime in the event of an attack.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4
Unstructured SWL (h/sem)	62	**Unstructured SWL (h/w)**	4

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب اسبوعيا	
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.	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	Secure Network Design and Architecture
Week 2	Secure network design principles
Week 3	Demilitarized zones (DMZs) and network segmentation
Week 4	Virtual LANs (VLANs) and network zoning
Week 5	Network Penetration Testing
Week 6	Introduction to network penetration testing
Week 7	Reconnaissance and information gathering techniques
Week 8	Exploitation and post-exploitation techniques
Week 9	Network Security in Cloud Environments
Week 10	Cloud computing security challenges and considerations
Week 11	Securing virtualized environments

Week 12	Cloud service provider security controls
Week 13	Mobile and IoT Network Security
Week 14	Security challenges in mobile and IoT networks
Week 15	Secure mobile device management (MDM)
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	Introduction to Network Security Principles
Week 2	Network Vulnerability Assessment and Scanning
Week 3	Network Firewall and Intrusion Detection/Prevention Systems
Week 4	Virtual Private Networks (VPNs) and Secure Remote Access
Week 5	Wireless Network Security
Week 6	Network Traffic Analysis and Intrusion Detection
Week 7	Network Incident Response and Forensics

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	"Network Security: Private Communication in a Public World" by Charlie Kaufman, Radia Perlman, and Mike Speciner: This book offers a comprehensive introduction to network security, covering both practical and theoretical aspects. It covers topics such as cryptography, authentication, secure email, VPNs, firewalls, and intrusion detection systems.	
Recommended Texts	"Principles of Computer Security: CompTIA Security+ and Beyond" by Wm. Arthur Conklin, Greg White, Chuck Cothren, Roger Davis, and Dwayne Williams: This book focuses on computer and network security, including concepts, principles, and practical techniques. It covers topics like cryptography, access control, network security protocols, vulnerability assessment, and incident response.	

Websites	Open Web Application Security Project (OWASP) - www.owasp.org: OWASP is a nonprofit organization dedicated to improving the security of software. Their website provides a wealth of information on web application security, including best practices, tools, and security guidelines.

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	تصميم المترجمات			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CMCs25_F32021**				
Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	3		**Semester of Delivery**	2	
Administering Department			**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الارشادية	
Module Objectives أهداف المادة الدراسية	Understanding the Compiler Structure: Students should acquire knowledge about the overall structure and components of a compiler. This includes understanding the phases of a compiler (lexical analysis, syntax analysis, semantic analysis, code generation, and optimization) and the interactions between these phases. Lexical Analysis: Students should learn how to design and implement a lexical analyzer (also known as a scanner) that performs tokenization of the input source code. This involves recognizing keywords, identifiers, literals, and other language constructs. Syntax Analysis: Students should understand how to design and implement a parser that checks the syntax of the source code based on a formal grammar. This phase involves constructing a parse tree or an abstract syntax tree (AST) that represents the hierarchical structure of the program. Semantic Analysis: Students should learn about semantic analysis, which involves checking the validity and meaning of the program based on the rules of the programming language. This phase includes type checking, scope analysis, and symbol table management. Intermediate Code Generation: Students should understand how to generate an intermediate representation of the source code that is independent of the target machine. This intermediate code serves as a bridge between the front-end and back- end of the compiler. Code Optimization: Students should learn about various optimization techniques that can be applied to the intermediate code to improve the efficiency and performance of the generated executable code. This includes techniques such as constant folding, common subexpression elimination, loop optimization, and register allocation. Code Generation: Students should gain knowledge about the process of translating the optimized intermediate code into the target machine language. This involves understanding the target architecture and generating efficient and correct machine code. Error Handling and Debugging: Students should learn techniques for error handling and reporting during the compilation process. They should also understand how to generate meaningful error messages that aid in the debugging of source code. Compiler Tools and Techniques: Students should become familiar with various tools and techniques used in compiler design, such as lexer and parser generators (e.g., Lex and Yacc), intermediate code representations (e.g., three-address code, quadruples), and optimization algorithms. Project Implementation: Students should undertake a practical project to design and implement a compiler for a simplified programming language. This project allows them to apply the concepts and techniques learned throughout the course. Overall, the module aims to provide students with a comprehensive understanding of the theory and practice of compiler design, enabling them to develop efficient and reliable compilers for programming languages

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The module on Compiler Design aims to achieve the following learning outcomes for students: Knowledge and Understanding: Understand the phases and components of a compiler. Comprehend the role and purpose of lexical analysis, syntax analysis, semantic analysis, code generation, and optimization in the compilation process. Recognize the importance of intermediate representations and code optimization techniques. Technical Skills: Design and implement a lexical analyzer (scanner) to tokenize the input source code. Design and implement a parser to check the syntax of the source code and construct a parse tree or abstract syntax tree. Perform semantic analysis tasks such as type checking, scope analysis, and symbol table management. Generate intermediate code that represents the source code in a machine- independent format. Apply optimization techniques to improve the efficiency and performance of the generated code. Generate target machine code based on the optimized intermediate representation. Problem-Solving: Analyze and solve problems related to the compilation process, such as identifying lexical and syntactic errors, resolving semantic conflicts, and optimizing code. Debug and handle errors during the compilation process. Evaluate and choose appropriate data structures and algorithms to optimize the compilation process. Critical Thinking: Evaluate the trade-offs and impact of different design decisions on the overall performance and efficiency of a compiler. Critically analyze and assess the quality and effectiveness of generated code. Apply critical thinking skills to identify and resolve complex issues in compiler design and implementation. Communication and Documentation: Clearly communicate and present ideas, concepts, and implementation details related to compiler design. Document the design decisions, algorithms, and techniques used in the development of a compiler. Write clear and concise error messages and diagnostic information to aid in debugging. Project Management: Plan, manage, and execute a compiler design project, including setting goals, defining milestones, and allocating resources effectively. Collaborate with team members, if applicable, to achieve project objectives and deliverables. Demonstrate time management skills and meet project deadlines.

	By the end of the module, students should have acquired the knowledge, skills, and abilities necessary to design and implement a functional compiler and have a deep understanding of the concepts and techniques involved in the compilation process. Top of Form
Indicative Contents المحتويات الارشادية	The indicative contents of a Compiler Design module may include the following topics: Introduction to Compiler Design: Overview of the compilation process and its stages. Role and importance of a compiler. Compiler structure and components. Lexical Analysis: Role of lexical analysis in the compilation process. Regular expressions and finite automata. Design and implementation of lexical analyzers (scanners). Tokenization and lexical error handling. Syntax Analysis: Context-free grammars and parsing techniques. Top-down parsing: Recursive descent and LL(1) parsing. Bottom-up parsing: Shift-Reduce and LR parsing. Construction and traversal of parse trees. Semantic Analysis: Semantic analysis and its importance. Type checking and type systems. Symbol tables and symbol table management. Scope analysis and variable resolution. Error handling and error recovery. Intermediate Code Generation: Intermediate representations and their purpose. Three-address code and quadruples. Translation of expressions, control structures, and statements into intermediate code. Generation of control flow graphs. Code Optimization: Introduction to code optimization and its goals. Common optimization techniques: constant folding, copy propagation, dead code elimination. Loop optimization: loop unrolling, loop fusion, loop-invariant code motion. Data flow analysis and optimization. Code Generation: Introduction to code generation. Target machine description and instruction selection. Register allocation and management. Code generation for expressions, control flow, and procedures. Error Handling and Debugging: Error handling mechanisms in compilers. Generation of meaningful error messages. Debugging techniques for compiled code.

	Compiler Tools and Techniques: Overview of compiler generation tools: Lex and Yacc. Intermediate code representations and transformations. Optimization algorithms and techniques. Compiler Design Project: Practical implementation of a compiler for a simplified programming language. Application of concepts and techniques learned throughout the module. Project planning, design, and development. Note: The actual contents may vary depending on the specific curriculum and the depth of coverage in the module. The topics mentioned above provide a general overview of the key areas typically covered in a Compiler Design module.

Learning and Teaching Strategies ستراتيجيات التعليم والتعلم	
Strategies	When approaching compiler design, several strategies and approaches can be employed to ensure efficient and effective implementation. Some of the commonly used strategies in compiler design include: Modular Design: Breaking down the compiler into modular components helps manage the complexity of the project. Each phase of the compilation process, such as lexical analysis, syntax analysis, semantic analysis, code generation, and optimization, should be implemented as a separate module with well-defined interfaces. This allows for easier development, testing, and maintenance of the compiler. Top-Down Design: Adopting a top-down design approach involves starting with the high-level structure of the compiler and gradually refining the design and implementation details. This approach allows for a clearer understanding of the overall architecture and helps in identifying and resolving potential issues early in the development process. Formal Language Theory: Understanding and applying concepts from formal language theory, such as regular expressions, context-free grammars, and automata theory, are essential for designing and implementing various components of the compiler. These theories provide the foundation for lexical analysis, parsing, and language specification. Parsing Techniques: Choosing the appropriate parsing technique is crucial for efficient and accurate syntax analysis. The two main approaches are top-down parsing (e.g., recursive descent, LL parsing) and bottom-up parsing (e.g., LR parsing). Depending on the language grammar and requirements, selecting the most suitable parsing technique is important for achieving good performance. Optimization Strategies: Code optimization aims to improve the performance and efficiency of the generated code. Various optimization techniques, such as constant

	folding, loop optimization, and register allocation, can be applied during the code generation and optimization phases. Understanding these techniques and selecting the appropriate ones based on the target machine architecture can greatly enhance the quality of the generated code. Error Handling and Reporting: Implementing effective error handling and reporting mechanisms is crucial for providing useful feedback to programmers. Clear and informative error messages help users identify and fix issues in their code. Additionally, proper error recovery techniques can help the compiler continue processing the code after encountering errors. Tool and Library Integration: Leveraging existing compiler generation tools and libraries can expedite the development process. Tools like Lex and Yacc (or their equivalents) can automate the generation of lexical analyzers and parsers based on specifications. Utilizing libraries for intermediate code representation, optimization algorithms, or target machine code generation can also save development effort and improve the overall quality of the compiler. Testing and Debugging: Rigorous testing is essential to ensure the correctness and reliability of the compiler. Test suites should cover various language constructs and edge cases to verify the behavior of the compiler. Additionally, debugging techniques, such as printing intermediate results or using debuggers, can aid in identifying and fixing issues during development. Continuous Improvement: Compiler design is an evolving field, and staying updated with the latest advancements and techniques is essential. Keeping abreast of new optimization algorithms, language features, and code generation strategies enables the implementation of more efficient and robust compilers. By employing these strategies and approaches, developers can design and implement compilers that are efficient, reliable, and capable of producing high-quality code. Top of Form

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب اسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب اسبوعيا	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.	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 Compilers
Week 2	Lexical Analysis
Week 3	Syntax Analysis
Week 4	Syntax Analysis (continued)
Week 5	Semantic Analysis
Week 6	Semantic Analysis (continued)
Week 7	Optimization Techniques
Week 8	Optimization Techniques (continued)
Week 9	Code Generation
Week 10	Code Generation (continued)
Week 11	Code Optimization
Week 12	Code Optimization (continued)

Week 13	Compiler Tools and Techniques
Week 14	Recent Developments and Future Trends
Week 15	Project Presentations and Review
Week 16	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبرات	
	Material Covered
Week 1	Introduction to Compiler Design Tools
Week 2	Parsing and Syntax Analysis
Week 3	Semantic Analysis and Symbol Table
Week 4	Intermediate Code Generation
Week 5	Code Optimization Techniques
Week 6	code Generation
Week 7	Project Development and Integration

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	"Compilers: Principles, Techniques, and Tools" by Alfred V. Aho, Monica S. Lam, Ravi Sethi, and Jeffrey D. Ullman: Also known as the "Dragon Book," this is a widely used textbook in compiler design. It covers all aspects of compiler construction, including lexical analysis, syntax analysis, semantic analysis, code generation, and optimization.	
Recommended Texts	"Principles of Compiler Design" by Alfred Aho and Jeffrey Ullman: This book covers the fundamental concepts of compiler design. It explains topics such as lexical analysis, parsing, semantic analysis, code generation, and optimization. It is suitable for students with a basic understanding of programming languages and formal languages.	

Websites	Compiler Design Tutorials by TutorialsPoint (https://www.tutorialspoint.com/compiler_design/index.htm): TutorialsPoint offers a comprehensive set of tutorials covering various aspects of Compiler Design. The tutorials provide explanations, examples, and code snippets to help understand the concepts and implementation techniques.

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