

Iraq University College

Computer Engineering Department

2026-2025

وزارة التعليم العالي والبحث العلمي

جهاز الاشراف والتقويم العلمي

دائرة ضمان الجودة والاعتماد الاكاديمي قسم الاعتماد الدولي



استمارة وصف البرنامج الاكاديمي

كلية العراق الجامعة

قسم هندسة الحاسبات

العام الدراسي 2026-2025

وزارة التعليم العالي والبحث العلمي
جهاز الاشراف والتقويم العلمي
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**استمارة وصف البرنامج الاكاديمي للكليات
للعام الدراسي 2025-2026**

اسم الجامعة : كلية العراق الجامعة

اسم كلية : العراق الجامعة

عدد الاقسام والفروع العلمية في الكلية : 8

تاريخ ملأ الملف :

التوقيع :

اسم رئيس القسم : أ.م.د. عبد الرضا علي الفانز

التاريخ :

دقق الملف من قبل : م.م. زينب اركان محمد

مسؤول ضمان الجودة في القسم : منتهى حسين

التاريخ :

التوقيع :

نموذج وصف البرنامج الأكاديمي

مراجعة أداء مؤسسات التعليم العالي ((مراجعة البرنامج الأكاديمي))

وصف البرنامج الأكاديمي

يوفر وصف البرنامج الأكاديمي هذا إيجازاً مقتضياً لأهم خصائص البرنامج ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنناً عما إذا كان قد حقق الاستفادة القصوى من الفرص المتاحة . ويصاحبه وصف لكل مقرر ضمن البرنامج

1. المؤسسة التعليمية	كلية العراق الجامعة
2. القسم الجامعي / المركز	هندسة الحاسبات
3. اسم البرنامج الأكاديمي	بكالوريوس في هندسة الحاسبات
4. اسم الشهادة النهائية	بكالوريوس في هندسة الحاسبات
5. النظام الدراسي	فصلي / بولونيا
6. برنامج الاعتماد المعتمد	-
7. المؤثرات الخارجية الأخرى	تنمية المهارات المهنية عن طريق الدورات و التدريب العملي والتدريب الصيفي ومتابعة سوق العمل : حيث تم عقد العديد من الندوات واللقاءات للتباحث بالمحتوى الأكاديمي والتطبيقي مع ارباب العمل الجامعات والكليات التي تحتوي تخصصات مناظرة : من خلال اليات عمل مشتركة تتيح التواصل بين الكادر التدريسي والطلبة لغرض الخروج برؤية مشتركة ووضع الخطط الخاصة بتطوير المحتوى العلمي
8. تاريخ إعداد الوصف	2026-2-1
9. أهداف البرنامج الأكاديمي Academic Program Objectives	

يهدف البرنامج الأكاديمي لتخريج طلبة في تخصص هندسة الحاسبات وتهيئتهم لما يلي:

- 1- للتمكن من العمل في المجالات التي تتطلب ربط شبكات الحاسبات كشركات الاتصالات والشركات التقنية والمؤسسات التعليمية.
- 2- للتمكن من العمل على تطوير البنية التحتية للحكومة الألكترونية والمساعدة على تجاوز المشكلات التقنية والحوسبة التي قد تحصل.
- 3- للتمكن من العمل بالمؤسسات الصناعية وخصوصا في مجالات التي تتطلب عمليات سيطرة محوسبة
- 4- للتمكن من العمل على تحديث البنية التحتية للمعامل الإنتاجية القديمة وتحديث عمليات السيطرة على الانتاج المتبعة سابقا الى عمليات حديثة مسيطرة عليها بالحاسبات وعن بعد.
- 5- اعداد وتأهيل المهندسين المتخصصين لتلبية متطلبات سوق العمل بقطاعيه الخاص والعام في هندسة الحاسوب من خلال التنوع في طرق التعلم والتعليم وتدريب الطلبة على تطبيق المعارف والمهارات المكتسبة لحل المشاكل الواقعية.
- 6- تقديم برامج أكاديمية متميزة في مجال هندسة الحاسبات بشقيه النظري والعملي بحيث تتوافق مع المعايير العالمية للجودة الأكاديمية وتلبي حاجة سوق العمل.
- 7- تشجيع وتنمية البحث العلمي في مجالات الحاسوب، السيطرة، الآلات الدقيقة، إضافة إلى مجالات الذكاء الاصطناعي والانسان الآلي وبرمجيات الحاسوب وشبكات الحاسبات والاتصالات.
- 8- اعداد بيئة محفزة لاعداء هيئة التدريس لتطوير معارفهم ومهاراتهم التعليمية والبحثية. صقل المهارات الشخصية في مختلف المجالات الخاصة بهندسة تقنيات الحاسوب. مثال على ذلك بناء وفحص مفردات أجهزة الحاسوب. وضبط ترابط الحواسيب على شبكات الانترنت . والاهتمام بامنية المعلومات والامن السيبراني. استخدام الحواسيب في الذكاء الاصطناعي

10. مخرجات التعلم المطلوبة وطرائق التعليم والتعلم والتقييم

- أ- الاهداف المعرفية
- 1- معرفة وفهم شبكات الاتصالات وكيفية ربطها.
- 2- معرفة وفهم الاشارات الرقمية وتحليلها .
- 3- معرفة وفهم اجزاء الحاسبة وكيفية تركيبها ومعالجة مشاكلها
- 4- معرفة وفهم الدوائر الألكترونية لمختلفة الأجهزة المحوسبة وكيفية تصميمها
- 5- معرفة وفهم لغات البرمجة المختلفة وكيفية استخدامها والاستفادة منها
- 6- معرفة انواع الميسطرات الرقمية وكيفية برمجتها وتصميم دوائرها

- ب – الأهداف المهاراتية الخاصة بالبرنامج
- 1 – كتابة وتنفيذ البرامج الخاصة بالحاسبات بالاتصالات والمسيطرات والخوارزميات الهندسية.
 - 2 – تصميم وتنفيذ شبكات الحاسبات السلكية واللاسلكية
 - 3 – تشخيص ومعالجة الاعطال الحاصلة في الأجهزة المحوسبة وملحقاتها.

طرائق التعليم والتعلم

المحاضرات الأكاديمية : حيث توفر الاساس المتين الذي يعتمد عليه بتطوير الرصيد المعرفي للطلبة المختبرات العملية والورش : التي توفر كل ما يحتاج اليه الطالب من خبرات تساعد على تطوير الجانب المهاري العملي وترسيخ المبادئ الضرورية للقيام بتنفيذ المشاريع العملية بصورة صحيحة واتباع خطوات السلامة المهنية للحد من الأضرار الناتجة على الأشخاص والممتلكات

التدريب المنهجي : يهدف التدريب المنهجي الى توفير معايشة بين الطالب وسوق العمل ليتمكن الطالب من فهم التطبيق العملي للمناهج الدراسية التي قام بدراستها.

طرائق التقييم

- الاختبارات في المادة المنهجية
- عمل التقارير
- عمل المشاريع و خصوصا في المختبرات العلمية
- تقييم الدرجات، التقارير والمشاريع اعتمادا على الفهم والاستيعاب، جودة العمل والالتزام والموضبة

- ج-مهارات التفكير والاهداف الوجدانية والقيمية.
- 1-زرع روح الأبداع لدى الطلبة والحرص على ايجادهم حلول مبتكرة للمشكلات المختلفة
 - 2- تنمية قابلية الطلبة على العمل الجماعي كفرق فعالة تخرج بنتائج متميزة.
 - 3- تنمية الشعور بالمسؤولية لدى الطلبة والتهيئة النفسية لتحمل الأعباء الملقة على عاتقهم.
 - 4- تنمية قيم الحرص والمثابرة على انجاز العمل للوصول الى نتائج مرضية.

طرائق التعليم والتعلم

طرح مشكلات علمية والطلب من الطلبة ايجاد اكثر من حل لها بطرق علمية مختلفة لتحفيز الجانب الأبداعي لدى الطلبة . تشكيل فرق عمل يتم تقييم نتائج عملها وتغير بنيتها بصورة دورية لتنمية روح التعاون وتحفيز الطلبة على بدل جميع الجهود اللازمة للعمل بالظروف المختلفة ومع اشخاص عدة.

طرائق التقييم

حيث يتم هذا التقييم من قبل اعضاء الهيئة التدريسية بصورة مباشرة ومن خلال ملاحظاتهم لتفاعل الطلبة وتطبيقهم أهداف القسم الوجدانية القيمية وتثبيت ملاحظاتهم بخصوص ذلك

المشاريع العملية ومشاريع التخرج: يتم تقييم مدى قدرة الطالب على الانجاز والأبداع وعلى العمل ضمن فرق والنتائج والحلول لمختلف المشكلات العلمية التي تواجه الطلبة.

- د -المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).
- 1- ربط الشبكات الداخلية والخارجية السلكية واللاسلكية.
 - 2- عمليات تصميم وتنفيذ الدوائر المطبوعة
 - 3- عمليات نصب وموائمة منظومات الاتصالات المحوسبة
 - 4- مهارات صيانة الأنظمة المحوسبة الشخصية والصناعية وكيفية صيانة المنظومات الملحقة بها.

طرائق التعليم والتعلم

المختبرات العملية والورش : التي توفر كل ما يحتاج اليه الطالب من خبرات تساعد على تطوير الجانب المهاري العملي وترسيخ المبادئ الضرورية للقيام بتنفيذ المشاريع العملية بصورة صحيحة واتباع خطوات السلامة المهنية للحد من الأضرار الناتجة على الأشخاص والممتلكات
التدريب المنهجي: يهدف التدريب المنهجي الى توفير معايشة بين الطالب وسوق العمل ليتمكن الطالب من فهم التطبيق العملي للمناهج الدراسية التي قام بدراستها.

طرائق التقييم

التقييم التفاعلي : حيث تتم عملية التقييم هذه بصورة مباشرة بين الطالب والتدريسي وتكون واحدة من اساسيات التغذية الراجعة التي يعتمد عليها اعضاء الهيئة التدريسية بتقييم عملية التعليم والتعلم . الأختبارات

الفصلية : وتكون الحلقة الوسطية لتقييم مدى اهتمام الطالب وتفاعله مع المادة العلمية التي تلقاها خلال الفصل الدراسي بجانبها الاكاديمي والمهاري الأختبارات النهائية : وتكون الحلقة النهائية لتقييم مدى اهتمام الطالب وتفاعله مع المادة العلمية التي تلقاها خلال السنة الدراسية بجانبها الاكاديمي والمهاري.

11.بنية البرنامج

أولاً : المرحلة الأولى والمرحلة الثانية والمرحلة الثالثة/ مسار بولونيا:

هذا العام 2026/2025 تدرس المرحل الثلاث الأولى بموجب مسار بولونيا وبالتوأمة مع قسم هندسة الحاسبات في جامعة ديالى. وقد اعد البرنامج الدراسي للمرحلة الأولى والثانية والثالثة كما يلي:

University of Diyala							جامعة ديالى																												
Bachelor's level (First cycle) - Honors Bachelor Degree in Computer Engineering							مستوى البكالوريوس (الدورة الأولى) - بكالوريوس مع مرتبة الشرف في هندسة الحاسوب																												
Four years (Eight Semesters) - 240 ECTS credits - 1 ECTS = 25hr							أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة اوروبية - كل وحدة اوروبية = ٢٥ ساعة																												
Program Curriculum (2024 - 2025)							المنهاج الدراسي للعام ٢٠٢٤ - 2025																												
Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSVL (hr/w)						Exam hr/se	SSVL hr/se	USSVL hr/se	SVL hr/se	ECTS	Module Type	Prerequisite Module(s) Code	SSVL hr/Week	USSVL hr/Week														
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Seminar (hr/w)																							
One		1	E 101	Mathematics I	الرياضيات I	English	4				1		3	78	72	150	6	B		5.2	4.8														
		2	CPE 101	Fundamentals of Programming	اساسيات البرمجة	English	2		3		1		3	93	82	175	7	C		6.2	5.5														
		3	CPE 103	Fundamentals of Electrical Circuits	اسس الدوائر الكهربائية	English	2		2		1		3	78	72	150	6	C		5.2	4.8														
		4	CPE 105	Principles of Logic Systems	مبادئ أنظمة المنطق	English	3				1		3	63	87	150	6	C		4.2	5.8														
		5	CPE 107	Engineering Drawing Using AutoCAD	الرسم الهندسي باستخدام	English				3			3	48	27	75	3	B		3.2	1.8														
		6	UD11	English Language I	اللغة الانكليزية I	English	2						3	33	17	50	2	B		2.2	1.1														
Total							13	0	5	3	4	0	18	393	357	750	30																		
UGI							SSVL (hr/w)						Exam hr/se	SSVL hr/se	USSVL hr/se	SVL hr/se	ECTS	Module Type	Prerequisite Module(s) Code	SSVL hr/Week	USSVL hr/Week														
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Seminar (hr/w)																							
							1	E 102	Mathematics II	الرياضيات II	English	4													1		3	78	72	150	6	B	E 101	5.2	4.8
							2	CPE 102	Computer Programming	برمجة الحاسوب	English	2											3		1		3	93	57	150	6	C	CPE 101	6.2	3.8
							3	CPE 104	Fundamentals of Electrical Circuits	اسس الدوائر الكهربائية	English	2											2		1		3	78	47	125	5	C	CPE 103	5.2	3.1
							4	CPE 106	Digital Logic Circuits Design	تصميم دوائر المنطق	English	2											2		1		3	78	47	125	5	C	CPE 105	5.2	3.1
							5	CPE 108	Electronic Physics	الفيزياء الالكترونية	English	3															3	48	52	100	4	C		3.2	3.5
							6	UD14	Human Rights and Democracy	حقوق الانسان والديمقراطية	Arabic	2															3	33	17	50	2	B		2.2	1.1
							7	UD12	Arabic Language I	اللغة العربية I	Arabic	2															3	33	17	50	2	B		2.2	1.1
Total							17	0	7	0	4	0	21	441	309	750	30																		

Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SVL	ECTS	Module Type	Prerequisite Module(s) Code	SSWL	USSWL
						CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Seminar (hr/w)		hr/sem	hr/sem	hr/sem				hr/Week	hr/Week
five	1	CPE 301	Engineering Analysis	تحليلات هندسية	English	3						3	48	77	125	5	C	CPE 202	3.2	5.1
	2	CPE 303	Signals and Systems	الإشارات والأنظمة	English	3						3	48	77	125	5	C		3.2	5.1
	3	CPE 305	Digital System Design	تصميم نظم رقمية	English	3		2				3	78	47	125	5	C	CPE 204	5.2	3.1
	4	CPE 306	Control Theory	نظرية سيطرة	English	3		2				3	78	47	125	5	C	CPE 202	5.2	3.1
	4	CPE 309	Data Communication and Networking	اتصالات البيانات والشبكات	English	2				1		3	48	77	125	5	C		3.2	5.1
	6	CPE 308	Operating Systems	نظم تشغيل	English	3						3	48	77	125	5	C		3.2	5.1
					Total	17	0	4	0	1	0	18	348	402	750	30				
Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SVL	ECTS	Module Type	Prerequisite Module(s) Code	SSWL	USSWL
						CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Seminar (hr/w)		hr/sem	hr/sem	hr/sem				hr/Week	hr/Week
six	1	CPE 302	Numerical Analysis	تحليلات عددية	English	3						3	48	77	125	5	C		3.2	5.1
	2	CPE 304	Digital Signal Processing	معالجة إشارات رقمية	English	3						3	48	77	125	5	C	CPE 303	3.2	5.1
	3	CPE 307	Statistics and Probability	الإحصاء والاحتمالية	English	2				1		3	78	47	125	5	C		5.2	3.1
	5	CPE 310	Web Design	تصميم مواقع	English	2		2				3	63	62	125	5	C		4.2	4.1
	5	CPE 311	Artificial Intelligence	ذكاء اصطناعي	English	3						3	48	77	125	5	C		3.2	5.1
	6	CPE 312	Digital Image Processing	معالجة صور رقمية	English	3		2				3	78	47	125	5	C	CPE 303	5.2	3.1
					Total	16	0	4	0	1	0	18	363	387	750	30				

12. بنية البرنامج

ثانيا : المرحلة الرابعة:

هذا العام 2026/2025 تدرس المرحل الرابعة بالنظام الفصلي وقد اعد البرنامج الدراسي لها كما يلي:

1- الفصل الاول

No.	Subjects	Units	Theoretical (h)	Practical (h)
1.	Crypt .& Network Security I	3	2	2
2.	GNSS Applications	3	2	2
3.	Computer Networks II	3	2	2
4.	Eng. Profession Ethics	3	3	
5.	Graduation Project I	3	3	-
المجموع		15	12	6

2- الفصل الثاني

No.	Subjects	Units	Theoretical (h)	Practical (h)
1.	Soft-Computing	3	2	2
2.	Network Security II	3	2	2
3.	Data Compression	3	2	2
4.	Embedded Systems	3	2	2
5.	Engineering Economy	3	3	
المجموع		15	11	8

13. الشهادات والساعات المعتمدة

- 1- درجة البكالوريوس في نظام مسار بولونيا تتطلب (240) وحدة معتمدة (ETCS)
- 2- درجة البكالوريوس في النظام الفصلي (السابق) تتطلب (149) وحدة معتمدة

14. التخطيط للتطور الشخصي

1. التحسين و التطور المستمر لاعضاء هيئة التدريس اعتمادا على الدورات التدريبية و الندوات العلمية حول المستجدات الحديثة في طرائق التدريس و التطورات العلمية و البحثية ضمن مجالات القسم
2. التركيز على اقامة المؤتمرات و الندوات والورش العلمية بالاضافة الى الابداعات الشخصية
3. تشجيع اعضاء هيئة التدريس على الحصول على الترقيات العلمية و المراتب الادارية
4. توفير البرمجيات المهمة للقسم للحصول على افضل تجربة تعليمية
5. التركيز على احتواء المختبرات على التجهيزات الخاصة بالتعليم المختبري و صيانتها دورياً.

15. معيار القبول (وضع الأنظمة المتعلقة بالالتحاق بالكلية أو المعهد)

معدل الطالب والكفاءة العلمية وحسب توجيهات القبول ويتم نشر ذلك في المواقع الالكترونية للكلية بالإضافة إلى إمكانية الاستفسار حضورياً.

16. أهم مصادر المعلومات عن البرنامج

1. الكتب و المراجع العلمية الحديثة
2. المجلات العلمية الرصينة
3. المصادر المنهجية
4. المستندات المستحدثة في الاختصاص

التخطيط للتطور الشخصي

يوفر البرنامج الأكاديمي والمهاري المعتمد كم معلوماتي أساسي للطالب يمكنه من العمل على تطوير ذاته بصورة مستمرة وكما يحرص الكادر التدريسي على تنمية المقدرة الذاتية للطالب من خلال حث الطلبة على البحث عن مشكلات ضمن مجال تخصصهم ثم العمل على حلها وتكون هذه العملية تحت اشراف ومتابعة الكادر التدريسي لتوفير النصيح والتوجيه الكفيل بزراع الاسس الصحيحة لعملية التطور الشخصي.

معايير القبول (وضع الأنظمة المتعلقة بالالتحاق بالكلية أو المعهد)

معدل الطالب والكفاءة العلمية وحسب توجيهات القبول ويتم نشر ذلك في المواقع الالكترونية للكلية بالاضافة إلى إمكانية الاستفسار حضوريا.

ويتم تحديد معايير القبول سنويا من قبل لجان متخصصة في وزارة التعليم العالي والبحث العلمي حيث تكون مدخلات قبول الطلبة كالاتي:

1. خريجي الفرع العلمي (علمي و تطبيقي وحيائي) وبمعدل لا يقل عن 62 %
2. خريجي الاعداديات الصناعية التخصصات التالية:
 - أ. تخصص الحاسوب
 - ب. تخصص الكهرباء
 - ج. تخصص القوة الكهربائية
 - د. تخصص تكنولوجيا الاعلام
 - هـ. تخصص شبكات الحاسوب
3. الحاسوب وتقنية المعلومات
 - أ. تخصص تجميع وصيانة الحاسوب
 - ب. تخصص شبكات الحاسوب والهاتف المحمول
 - ج. الإدارة الالكترونية
4. خريجي المعاهد التقنية

أهم مصادر المعلومات عن البرنامج

1. الكتب و المراجع العلمية الحديثة
2. المجلات العلمية الرصينة
3. المصادر المنهجية
- 4- لكتب العلمية التخصصية
- 5- الشبكة العنكبوتية المعلومات
- 6- الخبرات العلمية المتراكمة لكوادر القسم
- 7- التغذية الراجعة من سوق العمل

Iraq University College



First Cycle – bachelor's degree (B.Sc.) – Computer Engineering

بكالوريوس علوم - هندسة الحاسبات



Semester 1

No.	Module Code	Module Name in English
1	E 101	Mathematics I
2	CPE 101	Fundamentals of Programming
3	CPE 103	Fundamentals of Electrical Circuits I
4	CPE 105	Principles of Logic Systems
5	CPE 107	Engineering Drawing Using Autocad
6	UD11	English Language I

Semester 2

No.	Module Code	Module Name in English
1	E 102	Mathematics II
2	CPE 102	Computer Programming
3	CPE 104	Fundamentals of Electrical Circuits II
4	CPE 106	Digital Logic Circuits Design
5	CPE 108	Electronic Physics
6	UD14	Human Rights and Democracy
7	UD12	Arabic Language I

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

المرحلة الأولى / الفصل الأول

Fundamentals of Programming – 1

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Fundamentals of Programming</u>			Module Delivery
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>CPE 101</u>			
ECTS Credits	<u>7</u>			
SWL (hr/sem)	175			
Module Level	1	Semester of Delivery	1	
Administering Department	Computer Eng.	College	College of Engineering	
Module Leader		e-mail		
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification		
Module Tutor	Name (if available)	e-mail	E-mail	
Peer Reviewer Name	Taqwa Flayyih Hassan	e-mail		
Scientific Committee Approval Date	12/06/2023	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	Upon completion of this course, the student will be able to: 1. Understand computer system and classify programming languages . 2. Write simple C++ program. 3. Learn data types ,variables, arithmetic operators ,assignment and input statements. 4. Learn relational operators and logical expressions. 5. Using selection in program like if/if...else ,block statements , switch structures. 6. Develop executable programs by using repetition control structures : While Looping, Do...while Looping ,For Looping , Break and continue Statements.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize computer system and programming languages. 2. Build simple program by using different data types. 3. Define the relational operators and logical expressions. 4. Adding new abilities to program by using selection control structures. 5. Applying repetition control structures in programs. 6. Perform, Break and continue Statements.
Indicative Contents المحتويات الإرشادية	Introduction to computer system (3 hrs), Classification of programming languages (3 hrs), Introduction to problem solving (3 hrs), Computers and Programming Languages (3 hrs), Processing a C++ Program (3 hrs), Basics of a C++ Program, Data Types, Variables, Arithmetic Operators (3 hrs), Assignment and Input Statements (3 hrs), Input / Output, I/O Streams (3 hrs), Predefined Functions, Output Formatting (3 hrs), Control Structures I (Selection): Relational Operators, Logical Expressions (3 hrs), If/If...else, Block Statements (3 hrs), Switch Structures (3 hrs), Control Structures I (Repetition): While Looping, Do...while Looping (3 hrs), For Looping (3 hrs), Break and continue Statements (3 hrs),

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, homework's and examples. Practical examples helps students to understand the course material.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	81	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	7 and 14	LO #2 and #5
	Assignments	2	20% (20)	11 and 13	LO #4 and #5
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam	2 hr	10% (10)	9	LO #1 - #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to computer system
Week 2	Classification of programming languages
Week 3	Introduction to problem solving
Week 4	Computers and Programming Languages
Week 5	Processing a C++ Program
Week 6	Basics of a C++ Program , Data Types ,Variables, Arithmetic Operators
Week 7	Assignment and Input Statements
Week 8	Input / Output , I/O Streams
Week 9	Predefined Functions , Output Formatting
Week 10	Control Structures I (Selection) Relational Operators ,Logical Expressions
Week 11	If/If...else ,Block Statements
Week 12	Switch Structures
Week 13	Control Structures I (Repetition) While Looping, Do...while Looping
Week 14	For Looping
Week 15	Break and continue Statements
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Computer Assembly and parts Characteristics DOS commands
Week 2	Computer formatting and OS installation Handling operating system(windows)
Week 3	Software installation Handling MS word
Week 4	Handling MS Excel Handling MS power point
Week 5	Computer maintenance and troubleshooting BIOS Setting
Week 6	Introduction to C++ computer program? Editing, compiling and executing a simple program

	Overview of program structure and syntax
Week 7	Variables and constants Variable types, Declaration of a variable Storage of variables in computer memory, Assignment of variables
Week 8	Assignment of variables Assignment statements ,Arithmetic expressions ,Initialization of variables Declaration and initialization of symbolic constants
Week 9	Simple input and output Printing to the screen using output stream, Input of data from the keyboard using input stream
Week 10	Control Statements Boolean expressions and relational operators. Compound Boolean expressions using logical operators
Week 11	The IF selection control statement The IF/ELSE selection control statement ELSE IF multiple selection statement
Week 12	SWITCH multiple selection statement
Week 13	Control Statements, The WHILE repetition control statement Increment and decrement operators
Week 14	The DO. . WHILE repetition control statement , Break and continue Statements
Week 15	The FOR-repetition control statement

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	C++ Programming: From Problem Analysis to Program Design, 6th Edition; D.S. Malik	Yes
Recommended Texts	- Programming and problem solving with C++: comprehensive sixth edition, Nell Dale and Chip Weems. - Computer Science Textbook class XI, First Edition, 2019. - C++ Primer Plus, Sixth Edition	No
Websites	http://www.cplusplus.com/doc/tutorial/	

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.

Fundamentals of Electrical Circuits I –2

Module Information

معلومات المادة الدراسية

Module Title	<u>Fundamentals of Electrical Circuits I</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 103</u>				
ECTS Credits	<u>6</u>				
SWL (hr/sem)	<u>150</u>				
Module Level		1	Semester of Delivery		1
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader			e-mail		
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		MSc.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		10/06/2023	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	- To develop problem solving skills and understanding of circuit theory through the application of techniques. - To understand Temperature effect of the resistance - To understand Ohm's law - To understand series and parallel connections. Also, the Delta-Star Transformation - To understand voltage, current and power from a given circuit. - This course deals with the basic concept of electrical circuits. - This is the basic subject for all electrical and electronic circuits. - To understand Kirchhoff's current and voltage Laws problems. - To perform Superposition, Thevenin and Norton Theorems with Mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Recognize how electricity works in electrical circuits and Summarize what is temperature effect of the resistance. - Define Ohm's law and Describe electrical power, charge, and current. - Identify the basic circuit elements and Distinguish between series and parallel connections. - Explain the two Kirchhoff's laws (Voltage & Current) used in circuit analysis. - Explain Delta & Star connections with (Delta to Star) & (Star to Delta) Transformation. - Explain the theorems that utilize in circuit analysis.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Resistance</u> Circuit elements, Resistance of the material, Temperature Effects. [3 hrs] <u>Part B - Ohm's law</u> Ohm's law, Resistor in series, Resistor in parallel, Kirchhoff's voltage law, Kirchhoff's current law, Delta connection. Star connection, Delta to Star Transformation. Star to Delta [24 hrs] Transformation, Current and Voltage Sources. <u>Part C - Circuit Analysis and Theorems</u> The principle of Superposition, The Thevenin equivalent circuit, The Norton equivalent circuit, [18 hrs] Maximum power transfer, The Node Voltage Method, The Mesh Current Method.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem)

الحمل الدراسي المنتظم للطلاب خلال الفصل

79

Structured SWL (h/w)

الحمل الدراسي المنتظم للطلاب أسبوعيا

5

Unstructured SWL (h/sem)

الحمل الدراسي غير المنتظم للطلاب خلال الفصل

71

Unstructured SWL (h/w)

الحمل الدراسي غير المنتظم للطلاب أسبوعيا

4.5

Total SWL (h/sem)

الحمل الدراسي الكلي للطلاب خلال الفصل

150

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Temperature effect of the resistance
Week 2	Ohm's law
Week 3	Resistor in series
Week 4	Resistor in parallel
Week 5	Kirchhoff's voltage law
Week 6	Kirchhoff's current law
Week 7	Delta and Star connection
Week 8	(Delta to Star) and (Star to Delta) Transformation
Week 9	Current and Voltage Sources
Week 10	The principle of Superposition
Week 11	The Thevenin equivalent circuit
Week 12	The Norton equivalent circuit
Week 13	Maximum power transfer
Week 14	The Node Voltage Method
Week 15	The Mesh Current Method
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	DC Voltage & current Measurement
Week 2	Using an Ohmmeter & Resistor Characteristics
Week 3	Ohm's Law
Week 4	Power in DC Circuit
Week 5	Series Circuits
Week 6	Parallel Circuits
Week 7	Combined Series-Parallel Circuits
Week 8	Kirchhoff's voltage Law
Week 9	Kirchhoff's current Law
Week 10	Superposition Theorem
Week 11	Thevenin's Theorems
Week 12	Norton's Theorems
Week 13	Maximum Power Transfer Theorem
Week 14	The Node Voltage Method
Week 15	The Mesh Current Method

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 7th or 10th or 11th Edition.	Yes
Recommended Texts	- Charles K. Alexander and Matthew N. O. Sadiku, Fundamentals of Electric Circuits, McGrawHill, fourth edition, 2009. Behzad Razavi, <i>Fundamentals of Microelectronics</i>, John Wiley & Sons, Preview Edition, 2006 - J J Kathy and SA Naser, fundamental of Electrical Engineering, Schaum's outline, Academia International, 2004. - Any other materials available on the web.	No
Websites	https://www.youtube.com/playlist?list=PLHCD1a8slQtJbEKJawJL9qQaY5P9SgCUX	

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.

Principles of Logic Systems -3

Module Information

معلومات المادة الدراسية

Module Title	<u>Principles of Logic Systems</u>			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 105</u>				
ECTS Credits	<u>6</u>				
SWL (hr/sem)	<u>150</u>				
Module Level		1	Semester of Delivery		1
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader			e-mail		
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		10/06/2023	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	Digital Logic Circuits Design	Semester	2

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	- To acquire the basic knowledge of Digital systems and applications. - To understand and examine the structure of various number systems and its application in digital design. - The ability to understand conversion between digital systems. - The ability to understand, analyze and design logic gates. - Ability to identify basic requirements for a design application and propose a cost-effective solution. - The ability to understand, analyze and design various combinational circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Understand basic concepts and logic systems. - Understand number systems and conversions of number systems. - Students will be able to analyze and design logic gates using Boolean algebra and other key concepts. - Students will be able to describe the strengths and weaknesses of different system

	designs and select the appropriate design for a given problem. 5. Students will be able to communicate effectively about their designs, both orally and in writing. 6. Students will be able to understand the principles of combinational circuits.
Indicative Contents المحتويات الإرشادية	- Introduction to digital quantities and System Numbers [20 hrs] - Arithmetic Operations with different number systems, and Signed Numbers Digital Codes. [8 hrs] - Logic Gates and its applications [4 hrs] - Simplification of digital circuit design [20 hrs] - Introduction to Combinational Logic circuit and its functions [8 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, homework's and examples. Practical examples helps students to understand the course material.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعاً

Structured SWL (h/sem)	63	Structured SWL (h/w)	4
الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعياً	
Unstructured SWL (h/sem)	87	Unstructured SWL (h/w)	5.8
الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعياً	
Total SWL (h/sem)	150		
الحمل الدراسي الكلي للطلاب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (20)	6 and 12	LO #1 to #4 and #5 to #6
	Assignments	4	20% (20)	3 and 12	LO #2 to #6
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO #1 - #3
	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 digital quantities and numbering systems
Week 2	Binary and decimal numbers
Week 3	Octal and hexadecimal numbers
Week 4-5	Conversions between Numbering Systems
Week 6	Arithmetic operations with different number systems, complements of number systems
Week 7	Binary codes, BCD codes, Ex-3 code, and gray code.
Week 8	Logic Gates and its applications
Week 9-10	Boolean Algebra and Logic Simplification
Week 11	Simplification with karnaugh Map
Week 12-13	The karnaugh Map (two, Three, Four and Five- Variable Karnaugh Maps)
Week 14	Introduction to Combinational Logic circuit and circuit analysis
Week 15	Functions of Combinational Logic
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Digital Fundamentals, Thomas .L. Floyd, Pearson international edition.	Yes

Recommended Texts	Digital Design, M. Morris. Mano, Pearson prentice Hall .	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.

Engineering Drawing Using AutoCAD -4

Module Information

معلومات المادة الدراسية

Module Title	Engineering Drawing Using AutoCAD			Module Delivery	
Module Type	Basic learning activities			☐ Theory ☐ Lecture ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	CPE 107				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level		1	Semester of Delivery		1
Administering Department		Computer Eng.	College	College of Engineering	
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		Ali N. Albu-Rghaif	e-mail		

Scientific Committee Approval Date	11/06/2023	Version Number	1.0
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Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	10. The students obtain knowledge and understanding in the subject of engineering drawing by using the computer through the AutoCAD program 11. Understanding and teaching students the basics of engineering drawing related to computer engineering 12. Knowing the correct methods of engineering drawing using the computer and how to apply them in the AutoCAD program in the field of computer engineering 13. Increasing the student's experience in identifying drawing, designing engineering, electronic shapes, and electrical circuits. 14. Easy to publish, and give the drawing on people across the globe just in a second.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	7. Explain why CAD software is now replacing traditional pencil drawing. 8. Explain commands and AutoCAD's user interfaces, description of menu Bar and toolbars of AutoCAD 9. Recognize how AutoCAD defines the position of points with coordinates and specify the angle in AutoCAD 10. Explain How to draw lines, circles, Ellipses, Rectangles and arcs using precise methods 11. Learn editing commands: copy, cut, paste, erase, move, selecting objects, orthogonal projection, ISO drawing. 12. Developing the students' practical, theoretical and creative abilities in computer design techniques of various types. CAD Electrical, drawing electrical symbols on simple architectural plans
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – AutoCAD interfaces</u> The use of CAD in engineering drawing, description of menu Bar and toolbars [6 hrs] <u>Part B – Drawing</u>

[24 hrs] Drawing Ellipse, Rectangle, line, Ray, Circle, point, Arc, ----- etc.

Part C – Editing Commands and CAD Electrical

CAD Electrical, the use of various layers, drawing electrical symbols on simple architectural plans, editing commands: copy, cut, paste, erase, move, selecting [15 hrs] objects, orthogonal projection, ISO drawing.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

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	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The use of CAD in engineering drawing
Week 2	description of menu Bar and toolbars
Week 3	Line, point
Week 4	Rectangle
Week 5	Circle
Week 6	drawing Ellipse
Week 7	Arc, ----- etc.
Week 8	editing commands
Week 9	copy, cut
Week 10	paste, erase
Week 11	move
Week 12	selecting objects
Week 13	selecting objects
Week 14	CAD Electrical selecting objects
Week 15	Mechanical/ Special features The use of various layers selecting objects
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- AutoCAD 2019 Beginning and Intermediate - The benefits of using the electrical toolset in AutoCAD	pdf
Recommended Texts	Any other materials available on the web.	No
Websites	https://www.youtube.com/playlist?list=PLHCD1a8slQtJbEKJawJL9qQaY5P9SgCUX	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance

(50 - 100)	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.

Mathematics I -5

Module Information

معلومات المادة الدراسية

Module Title	<u>Mathematics I</u>			Module Delivery	
Module Type	<u>Basic learning activities</u>			Theory Lecture Tutorial	
Module Code	<u>E-101</u>				
ECTS Credits	<u>6</u>				
SWL (hr/sem)	<u>150</u>				
Module Level		1	Semester (s) offered		1
Administering Department			College	College of Engineering	
Module Leader			e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Review Committee Approval		10/06/2023	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	This module aims to provide students with an understanding of, and competence in the use of, mathematical techniques that are relevant to the solution of engineering problems. It will also give students a firm foundation from which to develop solutions to a wider and deeper range of engineering problems that they will encounter throughout their undergraduate engineering program of study.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Preliminaries : Explain mathematical coordinate systems, representing line, slope of line, shifting of lines 2. Vectors: Demonstrate an understanding of vectors in plane and space. 3. Function: Demonstrate an understanding of function and related variables, range and domain of function, types of functions and their graphs. 4. Limits and Continuity: Demonstrate an understanding of the fundamental concepts of calculus including limits, continuity, and differentiability. 5. Derivatives: Apply the techniques of differentiation at different types of functions including transcendental functions 6. Applications of derivatives: Apply the techniques of differentiation to solve problems involving rates of change, linearization, curve sketching, mean value theorem and Initial value problem. 7. Complex numbers: Demonstrate an understanding of complex numbers with basic operations and their mathematical and graphical representations including Euler's Formula
Indicative Contents المحتويات الإرشادية	The topics listed under the indicative content below are the underpinning areas of knowledge and understanding that will be obtained from successful completion of the module. The mathematical topics are illustrated in the context of relevant engineering scenarios. • Preliminaries Cartesian coordinates, polar coordinates, slope of lines, angle of inclination. • Functions, types of functions, graph of the functions, domain and range of function • Review of trigonometric function: graph of trigonometric function, range and domain of trigonometric functions, identities. • Limits and Continuity: Properties, limits involving infinity, continuity. • Transcendental functions: Inverse function, graph of inverse function, Logarithmic and exponential functions, inverse trigonometric functions, hyperbolic functions,

	inverse hyperbolic functions. • Derivatives: Definition, rules of derivative, Implicit differentiation, L hospital's rule, derivative of inverse functions • Applications of derivatives: rate of change problems, Relative maximum and relative minimum, Curve sketching with 1st and 2nd derivative, Linearization, Mean value theorem, Initial value problem, • Complex numbers: Basic definitions. The geometric representations of the complex numbers, argand diagram, Basic operations with complex numbers, Euler's Formula • Vectors: Introduction to vectors
Course Description	This course lays the foundation for a robust understanding of mathematical concepts that underpin the various disciplines within engineering. It covers a breadth of topics ranging from coordinate systems, slopes of lines, and angles of inclination to the introduction of two- and three-dimensional coordinate systems. A focus is also given to the understanding and manipulation of functions, including domain and range determination and function composition. The course incorporates a substantial overview of trigonometry, limits, continuity, derivatives, including their applications in real-world engineering contexts in addition to complex numbers and their mathematical representation. By the end of the course, students will have a sound understanding of these principles, preparing them for more advanced engineering courses in their respective fields.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Begin In Mathematics I, then employ a range of teaching strategies to ensure first-year engineering students fully grasp the various mathematical concepts. Instructional methods include interactive lectures, where core mathematical principles are explained in detail, and practical problem-solving sessions to provide hands-on learning experiences. Collaborative group work encourages peer-to-peer learning and reinforces understanding through shared insights. Regular formative assessments will be conducted to monitor students' understanding of the material, and feedback will be promptly given to guide their learning process. Instructors will maintain office hours for personalized support, and online resources will be available to supplement classroom instruction. Emphasis will be placed on relating mathematical concepts to real-world engineering applications to make the learning experience more relevant and engaging. These strategies aim to develop students' critical thinking skills, enhance their problem-solving abilities, and prepare them for advanced engineering studies.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل In class lectures 53 In class tests 10 Tutorial 15	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل Assignment 20 Preparation for tests 20 Homework 32	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time (hr)	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3,5, 10, 12, 14	LO #1, 2, 3, 4,5 and 7
	Assignments	6	20% (20)	4, 8, 12	LO # 1, 2, 3, 4, 5 and 6
Summative assessment	Midterm Exam	2	20% (20)	7	LO # 1,4
	Final Exam	3	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	inclination, functions, types of functions, graph of the functions, Cartesian coordinates, slope of lines, angle of identifying functions, Circles and parabolas ,domain and range
Week 2	Introduction to vectors
Week 3	•Preliminaries

	Composite functions, shifting a graph of a function, scaling and Sum, differences, products and quotients of reflecting a graph of a function, Absolute value
Week 4	•Review of trigonometric function graph of trigonometric function, range and domain, identities
Week 5	•Limits and Continuity Properties, limits involving infinity, continuity
Week 6	•Transcendental functions Inverse function, graph of inverse function, Logarithmic and exponential functions, trigonometric functions , inverse trigonometric functions, hyperbolic functions, inverse hyperbolic functions
Week 7	•Derivatives Definition, rules of derivative, slopes , tangent lines, chain rule, derivative of trigonometric functions, Implicit differentiation, L hospital's rule
Week 8	derivative of inverse trigonometric functions, derivative of exponential and logarithmic functions
Week 9	•Applications of derivatives Speed and acceleration, Relative maximum and relative minimum
Week 10	Curve sketching with 1st and 2nd derivative
Week 11	Linearization
Week 12	rate of change problems
Week 13	Mean value theorem -Initial value problem
Week 14	Complex numbers: Basic definitions. The geometric representations of the complex numbers, argand diagram
Week 15	Basic operations with complex numbers, Euler's Formula
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	George B. Thomas and Ross L. Finney, "Calculus and Analytic Geometry, Addison- Wesley	Yes
Recommended Texts	Thomas Calculus, by George B.Thomas,Jr,Elevnth Edition Media Upgrade 2008	Yes

GRADING SCHEME

مخطط الدرجات

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

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

Note:

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

English language I -6

Module Information

معلومات المادة الدراسية

Module Title	<u>English language I</u>		Module Delivery		
Module Type	<u>Basic learning activities</u>		☒ Theory ☒ Lecture ☐ Lab ☐ L Tutorial ☐ Practical ☐ Seminar		
Module Code	<u>UD01</u>				
ECTS Credits	<u>2</u>				
SWL (hr/sem)	<u>50</u>				
Module Level		UGI	Semester (s) offered		1
Administering Department		All Department	College	College of Engineering	
Module Leader			e-mail		
Module Leader’s Acad. Title		Instructor	Module Leader’s Qualification		
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		12/06/2023	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, Indicative Contents and Brief Description

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر

Module Aims أهداف المادة الدراسية	The module aims to develop the students' English skills in reading, writing, listening and speaking.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	8. Read and understand simple texts in English. 9. Answer simple comprehension questions and match sentences about texts. 10. Reconstruct texts by reordering sentences. 11. Understand the main idea of a text. 12. Identify specific information in a text. 13. Writing and paraphrasing paragraphs.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. i) Grammar has a core place in language teaching and learning. ii) A wide variety of practice tasks in all the four skills are essential to language learning. iii) Everyday expressions, particularly of spoken English, also need a place in the syllabus. These can be functional, social, situational or idiomatic.
Course Description	Each unit is organized to enhance students' basic knowledge of vocabulary and grammar through reading texts. The students will learn how to form simple sentences and use them in real life situations as well as in writing different assignments. By the end of the course, students will be able to produce basic sentences and communicate in simple real-life situations.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل 6In class lectures2 In class tests5 2Seminars	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا 2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل Library, dorm, home memorizing5 Preparation for tests8 Homework4	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا 1.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50	

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

Material Covered

Week 1	MAIN COURSE SPEAKING, LISTENING , VOCABULARY GRAMMAR, READING , am/is/are my/your This is... Introduction dialogues, Everyday English dialogues Introductions, Good morning! Practicing introduction dialogues. People meet each other and introduce someone else. How are you? What's this in English? Numbers 1-10 and plurals.
Week 2	He/she/they His/her. Questions Where are they from?, Two people are on holiday in New York. Students ask and answer questions about where people are from. Countries, Numbers 10-20 A set of cities and countries: Brazil, Spain... Adjectives: awful, really good, fantastic, beautiful Nouns: centre, hospital, building, park
Week 3	Verb to be is recycled and extended to include negative and question forms. We're in Las Vegas! Roleplay: in a band. An interview with the band Metro 5. Jobs: a nurse, a doctor.. Personal information: surname, first name, address, married ... Social expressions: I'm sorry, thanks, please...
Week 4	Possessive adjectives. Possessive 's. Has/ have Adjective + noun Irregular Plurals Paddy McNab and his family, My best friend. The alphabet, On the phone, Saying email addresses. Who are they? Listen and identify the people. The family: mother, son.. Describing a friend: very beautiful, really funny...
Week 5	Present Simple: I/you/we/they a/an Adjective + noun Colin Brodie from Dundee. Role play: At a party. Where is Colin? Who is he with? At a party: Flavia and Terry are at a party in London. The lexical set of sports/food/drinks. Languages and nationalities.
Week 6	Present Simple: He/she Question and negatives Adverbs of frequency Prepositions of time Lois Maddox Talking about daily routines, Asking and answering questions about daily routines, Lifestyle questionnaire Listening a phone conversation between Lois and Elliot. Days of the week. The time. Words that go together: watch TV, get up early...
Week 7	Question words Subject pronouns Object pronouns Possessive pronouns This and that A postcard from San Francisco, A holiday postcard. Describing lifestyles, preferences and places, Roleplay: conversations in town. Listening the requests with Can I.....? Adjectives: lovely, terrible, comfortable, friendly... Opposite adjectives: new/old, big/small Places: chemist, post office
Week 8	There is /are Prepositions: in, on, under, next to Vancouver-the best city in the world, What to do and where to go. Talking and asking about rooms and furniture, Giving directions. My home town, Steve talks about living in Vancouver. Rooms and furniture: living room, bedroom ... In and out of town: beach, mountain, sailing,...
Week 9	Was/were born Past simple: irregular verbs It's a Jackson Pollock. Telling a story from pictures, Saying the dates in English. Magalie Dromand, Magalie dromand talks about her family. Saying years People and jobs Irregular verbs Have, do, go: have lunch, do homework, go shopping
Week 10	Past simple: regular and irregular Questions Negatives Ago Dialogues with simple past. Did you have a good weekend? Asking about holidays, A questionnaire, My last holiday, Roleplay: asking and giving directions. Angie and Rick are at work, Jack and Millie's holiday. Weekend activities: go to the cinema,

	have a meal... Time expressions: on Monday, last night... Sports and leisure: tennis, skiing, windsurfing... Play or go: play tennis, go skiing... Seasons: winter, summer...
Week 11	Can / can't, Adverbs, Adjective + noun Requests and offers The Internet, What can you do on the internet? Talking about what you can do, Talking about everyday problems, Five people talk about what they do on the internet. Verbs: draw, run, drive... Verb+noun: Listen to the radio, chat to friends Adjective+noun: fast car, busy city, dangerous sport Opposite adjectives: dangerous/ safe, old/modern, old/young.
Week 12	I'd like, You are what you eat, Discussion-what is a good diet? Conversation with Adam, Shopping: bread, milk, fruit, Please and thank you Some /any, Like and would like People from different parts of the world describe what they eat. Roleplay: Ordering a meal. Birthday wishes, What people want on their birthday. stamps, cheese, ham... Food: cereal, salad, pasta, fish... In a restaurant: menu, starter, desert, soup, salmon
Week 13	Present continuous, Present simple and present continuous. This week is different, Colin, a millionaire, gives money to homeless teenagers What's the matter? Why don't you? What is Nigel wearing? Nigel is on holiday, What's the matter. Colours: blue, red, green... Clothes: jacket, trousers, shoes and socks... Opposite verbs: buy/sell, love/hate, open/close...
Week 14	Future plans, Revision: question words, tenses. Seven countries in seven days, Life's big events: three people talk about their family, education, work and ambitions. A mini autobiography. Eddie is talking to a friend about his holiday plans, social expressions Transport: travel by bus, coach, motorbike, plane... Revision
Week 15	Irregular verbs, phonetic symbols, consonants and vowels.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	New Headway Beginner, by lizand john soars	Yes
Websites	https://www.learnenglish.de/ https://www.englishgrammar.org/ https://www.phrasebank.manchester.ac.uk/	

GRADING SCHEME

مخطط الدرجات

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

Note:

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

المرحلة الأولى / الفصل الثاني

Computer Programming – 1

Module Information

معلومات المادة الدراسية

Module Title	<u>Computer Programming</u>	Module Delivery
Module Type	<u>Core</u>	☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>CPE 102</u>	
ECTS Credits	<u>6</u>	
SWL (hr/sem)	<u>150</u>	

Module Level	1	Semester of Delivery	2
Administering Department	Computer Eng.	College	College of Engineering
Module Leader		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Taqwa Flayyih Hassan	e-mail	
Scientific Committee Approval Date	12/06/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CPE 101	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Upon completion of this course, the student will be able to: 15. Define and use functions in C++ program. 16. Learn Enumeration type with Functions 17. Learn how to define String type with string Operations 18. Learn define and use arrays and strings 19. Accessing struct members, I/O structs 20. Define pointer data types , Address of Operator (&) ,Pointer Variables 21. Analyze and model classes and their relationship. 22. Apply recursion. 23. Perform simple file I/O streams.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	13. Recognize functions in C++ program and their types and how th use them in program 14. Define the Enumeration type with Functions 15. Identify String type with string Operations 16. Using arrays with their types in programs and strings with functions. 17. Using structures to define data and recognize how to use them. 18. Applying pointer data types and classes. 19. Apply recursion in functions 20. Perform simple file I/O streams

Indicative Contents

المحتويات الإرشادية

Review of programming fundamentals (3 hours)
User-Defined Functions (6 hours)
User-defined simple data types and the string type (6 hours),
Arrays and strings (9 hours)
Records (Structs) (6 hours)
Pointers, Classes (6 hours)
Recursion (3 hours)
File Input/Output (6 hours)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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, homework's and examples. Practical examples help students to understand the course material.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem)

الحمل الدراسي المنتظم للطالب خلال الفصل

94

Structured SWL (h/w)

الحمل الدراسي المنتظم للطالب أسبوعيا

6

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	20% (20)	6 and 12	LO #2 and #7
	Assignments	3	20% (20)	4, 7 and 10	LO #3 and #8
	Projects / Lab.				
	Report				

Summative assessment	Midterm Exam	2 hr	10% (10)	9	LO #1 - #5
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review of programming fundamentals
Week 2	User-Defined Functions Value-Returning Functions ,return Statements
Week 3	Void Functions ,Parameters
Week 4	Enumeration Type, Functions and Enumeration Types
Week 5	String Type, Additional string Operations
Week 6	Arrays and strings One-Dimensional Array ,Indexing
Week 7	Array Searching , c-Strings
Week 8	Parallel Arrays ,Multidimensional Arrays
Week 9	Records (Structs) Accessing struct Members , I/O structs
Week 10	Arrays vs Structs
Week 11	Pointers, Classes Pointer data types , Address of Operator (&) ,Pointer Variables
Week 12	Dynamic Arrays
Week 13	Recursion Direct Recursion , Indirect Recursion ,Recursion vs Iteration
Week 14	File Input
Week 15	File Output
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Review of programming fundamentals
Week 2	Example of function definition, declaration and call . Function header and body , Function declaration ,Function call and execution Function arguments ,Passing by value or reference

Week 3	Math library and system library built-in functions, Mathematical functions , How can I find out what library a function is in?
Week 4	Learn how to create and manipulate your own simple data type called the enumeration type
Week 5	Explore the string data type and learn how to use the various string functions to manipulate strings
Week 6	Arrays Declaration ,Array elements and indexing , Assigning values to array elements
Week 7	Passing arrays to functions , Character arrays
Week 8	Multi-dimensional arrays
Week 9	Learn about records (structs), Examine various operations on a struct
Week 10	Explore ways to manipulate data using a struct, Learn about the relationship between a struct and functions, Discover how arrays are used in a struct, Learn how to create an array of struct items
Week 11	Learn about the pointer data type and pointer variables , Explore how to declare and manipulate pointer variables , Learn about the address of operator and the dereferencing operator, Discover dynamic arrays,
Week 12	Discover the peculiarities of classes with pointer member variables Examine the relationship between the address of operator and classes
Week 13	Learn about recursive definitions, Explore the base case and the general case of a recursive definition Learn about recursive functions
Week 14	Reading files
Week 15	writing to files

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	C++ Programming: From Problem Analysis to Program Design, 6th Edition; D.S. Malik	Yes
Recommended Texts	- Programming and problem solving with C++: comprehensive sixth edition, Nell Dale and Chip Weems. - Computer Science Textbook class XI, First Edition, 2019. - C++ Primer Plus, Sixth Edition	No
Websites	http://www.cplusplus.com/doc/tutorial/	

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.

Fundamentals of Electrical Circuits II -2

Module Information

معلومات المادة الدراسية

Module Title	<u>Fundamentals of Electrical Circuits II</u>			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	CPE 104				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		1	Semester of Delivery		2
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader			e-mail		
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		MsC.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Ali N. Albu-Rghaif	e-mail		
Scientific Committee Approval Date		26/12/2023	Version Number	1.1	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Fundamentals of Electrical Circuits I	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	24. To develop problem solving skills and understanding of circuit theory through the application of techniques. 25. To understand Alternating Quantities 26. To understand Polarities & Direction and Phase Relations 27. To understand Average & Effective Value 28. To understand the Basic Elements (Resistance, Inductance, Capacitance) and Phasors 29. This course explains Series and Parallel AC circuits 30. To understand Resonance
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	21. Recognize the Alternating Quantities in electrical circuits and know the definition of the quantities 22. Define the Polarities & Direction of both voltage and current, and explain the Phase Relations 23. Identify Average & Effective Value and Complex representation of A.C value 24. Explain the Basic Elements (Resistance, Inductance, Capacitance) and what is the phase relation between voltage and current if the circuit have one or more than one elements 25. Explain Series and Parallel connections in AC Circuits 26. Applying the two Kirchhoff's laws (Voltage & Current) in AC Circuits. 27. Explain the Resonance applications and how to calculate the resonance frequency
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Introduction to Alternating Quantities</u> Alternating Quantities, Polarities & Direction, Phase Relations, Average & Effective, Complex representation of A.C Value. [15 hrs] <u>Part B - Basic Elements and Circuit Connections</u> Series Configuration, Parallel Configuration, Series and Parallel Configuration, Kirchhoff's [24 hrs] voltage and current law in A.C circuits. <u>Part C - Resonance</u> [6 hrs] Resonance in series circuit, Resonance in parallel circuit.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem)

الحمل الدراسي المنتظم للطلاب خلال الفصل

79

Structured SWL (h/w)

الحمل الدراسي المنتظم للطلاب أسبوعيا

5

Unstructured SWL (h/sem)

الحمل الدراسي غير المنتظم للطلاب خلال الفصل

46

Unstructured SWL (h/w)

الحمل الدراسي غير المنتظم للطلاب أسبوعيا

3.1

Total SWL (h/sem)

الحمل الدراسي الكلي للطلاب خلال الفصل

125

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Alternating Quantities
Week 2	Polarities & Direction
Week 3	Phase Relations
Week 4	Average & Effective
Week 5	Complex representation of A.C Value

Week 6&7	Series Configuration, , ,
Week 8&9	Parallel Configuration
Week 10&11	Series and Parallel Configuration
Week 12	Kirchhoff's voltage law in A.C circuits
Week 13	Kirchhoff's current law in A.C circuits
Week 14	Resonance in series circuit
Week 15	Resonance in parallel circuit
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction of an Alternative Current
Week 2	AC voltage measurements
Week 3	AC current measurements
Week 4	AC R, C, L circuit
Week 5	AC RC Series circuit
Week 6	AC RC Parallel circuit
Week 7	AC RL Series circuit
Week 8	AC RL Parallel circuit
Week 9&10	AC RLC circuit
Week 11	Power in AC circuit
Week 12&13	Series Resonant circuit
Week 14&15	Parallel Resonant circuit

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 7th or 10th or 11th Edition.	Yes
Recommended Texts	- Charles K. Alexander and Matthew N. O. Sadiku, Fundamentals of Electric Circuits, McGrawHill, fourth edition, 2009. - Behzad Razavi, <i>Fundamentals of Microelectronics</i>, John Wiley & Sons, Preview Edition, 2006 - J J Kathy and SA Naser, fundamental of Electrical Engineering, Schaum's outline, Academia International, 2004. - Any other materials available on the web.	No
Websites	https://www.youtube.com/playlist?list=PLHCD1a8slQtKqkfG5FISKwHxVzkptxZVR	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
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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.

Digital Logic Circuits Design –3

Module Information					
معلومات المادة الدراسية					
Module Title	<u>Digital Logic Circuits Design</u>		Module Delivery		
Module Type	<u>Core</u>		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	<u>CPE 106</u>				
ECTS Credits	<u>5</u>				
SWL (hr/sem)	<u>125</u>				
Module Level		1	Semester of Delivery		2
Administering Department		Computer Eng.	College	College of Engineering	
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		Ahmed Salah Hameed	e-mail		
Scientific Committee Approval Date		26/12/2023	Version Number	1.1	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Principles of Logic Systems	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

31. To acquire the basic knowledge of combinational and sequential logic circuits.
32. Have a thorough understanding of different logic circuits and its applications.
33. To help students understand the design of complex digital circuits.
34. Ability to identify basic requirements for a design application and propose a cost-effective solution.
35. To prepare students to perform the analysis and design of various digital electronic circuits.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

28. Students will be able to describe the strengths and weaknesses of different logic circuits and select the appropriate design for a given problem.
29. Students will be able to communicate effectively about their designs, both orally and in writing.
30. Students will be able to work effectively in teams to design and implement combinational and sequential digital circuits.
31. Students will be able to apply the principles of sequential logic design to more complex problems.
32. Students will be able to assess the performance and reliability of digital systems.
33. Students will be able to learn independently and continue to develop their knowledge and skills in the field of logic design.

Indicative Contents

المحتويات الإرشادية

- Overview to Combinational Logic circuits [3 hrs]
- Combinational Logic circuits design. [27 hrs]
- Introduction to sequential logic circuits [3 hrs]
- Flip-Flops and it's applications [9 hrs]
- Counters [3 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview to Combinational Logic circuits
Week 2	Adders and Subtractors circuits
Week 3	Series and Parallel Binary Adders circuits
Week 4	Ripple carry versus Parallel Look-Ahead Carry Adders circuits
Week 5	Binary multiplier circuits and Magnitude comparators circuit.
Week 6&7	Encoders, and Decoders circuits
Week 8&9	Multiplexers, and Demultiplexers circuits.
Week 10	Parity Generators/Checkers and design of code conversion circuits.

Week 11	Introduction to sequential logic circuits
Week 12-14	Flip-Flops:(Latches, Edge-Triggered Flip-Flops) and it's applications.
Week 15	Counters
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to logic gates
Week 2	Lab 2: NOR Gate, NAND Gate, and XOR Gate application
Week 3	Lab 3: Comparator Circuit
Week 4	Lab 4: Half –Adder
Week 5	Lab 5: full –Adder Circuit
Week 6	Lab 6: Half Subtractor
Week 7	Lab 7: full Subtractor Circuit
Week 8	Lab 8: Even and odd Parity Generator and Checker Circuit
Week 9	Lab 9: Code converter Circuits
Week 10	Lab 10: Encoder Circuit
Week 11	Lab 11: Decoder Circuit
Week 12	Lab 12: Multiplexer Circuit
Week 13	Lab 13: De - Multiplexer Circuit.
Week 14	Lab 14: Flip- Flop application Circuits
Week 15	Lab 15: Counters

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 7th or 10th or 11th Edition.	Yes
Recommended Texts	- Charles K. Alexander and Matthew N. O. Sadiku, Fundamentals of Electric Circuits, McGrawHill, fourth edition, 2009. - Behzad Razavi, <i>Fundamentals of Microelectronics</i>, John Wiley & Sons, Preview Edition, 2006 - J J Kathy and SA Naser, fundamental of Electrical Engineering, Schaum's outline, Academia International, 2004. - Any other materials available on the web.	No
Websites	https://www.youtube.com/playlist?list=PLHCD1a8slQtKqkfG5FISKwHxVzkptxZVR	

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.				

Electronic Physics –4

Module Information					
معلومات المادة الدراسية					
Module Title	<u>Electronic Physics</u>		Module Delivery		
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	<u>CPE 108</u>				
ECTS Credits	<u>4</u>				
SWL (hr/sem)	<u>100</u>				
Module Level		1	Semester of Delivery		2
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader			e-mail		
Module Leader’s Acad. Title		Professor	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		10/06/2023	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

36. To develop problem solving skills and understanding of electronic physics through the application of techniques.
37. To understand PN junction and diode operation.
38. This course deals with the applications of the diodes.
39. To understand the operation and construction of DC Power supply.
40. To understand the construction and operation of Logic gates circuits using diodes.
41. To understand the Zener diode operation and applications.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

34. Understand the atomic structure and the differences between conductors, insulators and semiconductors.
35. Learn the construction of intrinsic and extrinsic semiconductors.
36. Summarize the operation of diode and the diode characteristics.
37. Discuss the DC analysis of the diodes and the Diode models.
38. Understand the small signal diode model.
39. Explain other diode types.
40. Understand the operation and analysis of Diode rectifiers circuits.
41. Explain the operation and analysis of Clipping and Clamping Diode Circuits.
42. Understand the construction and operation of logic gates (AND/OR) using Diodes.
43. Explain the construction and operation of Zener Diode.
44. Understand the application of Zener diode in electronic circuits as a voltage regulator.

Indicative Contents

المحتويات الإرشادية

Indicative content includes the following.
Introduction: Overview about Insulators, Conductors, Semiconductors, Intrinsic and Extrinsic Semiconductors, P.N Junction; Forward and Reverse Biasing (9 hrs)
Physical Operation of Diodes (Diode Characteristics), DC Analysis of the Diode, DC Load Line and Q-Point, Constant Voltage Drop Model, Piecewise Linear Diode Model, Small Signal Diode Model. (9 hrs)
Other Diode types: The Schottky-Barrier Diode (SBD), Photodiodes, Light-Emitting Diodes (LEDs) (3 hrs)
Diode Applications: Half Wave Rectifier, Centre Tapped Transformer Rectifier, Bridge Rectifier (6 hrs)
The operation and analysis of Serial and parallel Clipping circuits and clamping circuits (6 hrs)
Operation and analysis of the AND & OR Logic Gates using Diodes (3 hrs)
DC Power supply construction and operation (3 hrs)
Zener Diode construction, operation, circuits and applications (6 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعاً

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	6 and 12	LO #1 to #4 and #6 to #8
	Assignments	3	20% (20)	4, 7 and 10	LO #2, #3, #4, #5 and #7,#8,#9
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam	2 hr	10% (10)	9	LO #1 - #7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Overview about Insulators, Conductors, Semiconductors
Week 2	Intrinsic and Extrinsic Semiconductors.
Week 3	PN Junction; Forward and Reverse Biasing
Week 4	Physical Operation of Diodes (Diode Characteristics)
Week 5	The DC Analysis of the Diode
Week 6	The Small Signal Diode Model
Week 7	Other Diode types
Week 8	Half Wave Rectifiers
Week 9	Full Wave Rectifiers
Week 10	Clipping Circuits
Week 11	Clamping Circuits
Week 12	Operation and analysis of the AND & OR Logic Gates using Diodes

Week 13	Power Supply Construction
Week 14	Zener Diode Construction and Operation
Week 15	Zener Diodes Applications and Circuits
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 7th or 10th or 11th Edition.	Yes
Recommended Texts	- Sedra and Smith, <i>Microelectronic Circuits</i>, Oxford University Press, <i>Sixth Edition</i>, 2010 - Behzad Razavi, <i>Fundamentals of Microelectronics</i>, John Wiley & Sons, Preview Edition, 2006 - Jimmie J. Cathey, PhD, <i>Theory and Problems of Electronic Devices and Circuits</i>, 2nd Edition, 2002. - Any other materials available on the web.	No
Websites	https://youtube.com/playlist?list=PLo6jdcSSoHsKhiCJaZF9XZR9RRZas75HU	

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.

Mathematics II –5

Module Information

معلومات المادة الدراسية

Module Title	Mathematics II	Module Delivery
Module Type	<u>Basic learning activities</u>	☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial
Module Code	E 102	
ECTS Credits	6	

SWL (hr/sem)	150		☐ Practical ☐ Seminar	
Module Level	1	Semester (s) offered		2
Administering Department		College	College of Engineering	
Module Leader		e-mail		
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Review Committee Approval	10/06/2023	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	E 101	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	This module aims to provide students with an understanding of, and competence in the use of, mathematical techniques that are relevant to the solution of engineering problems. It will also give students a firm foundation from which to develop solutions to a wider and deeper range of engineering problems that they will encounter throughout their undergraduate engineering program of study.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	14. Integration: Demonstrate an understanding of the fundamental concept of integration and antiderivative including types of integrations 15. Integration and transcendental functions: Extend the concept of integration to cover the integration of different types of transcendental functions 16. Numerical integration: Explain the fundamentals of numerical integration focusing on trapezoidal rule and Simpson's rule. 17. Methods of integration: Apply the techniques of integration to evaluate the integrals that cannot be solved directly. 18. Application of definite integrals: Extend the concept of integration to solve several problems involving area, volume, length of curve, surface area by revolution, center of mass and moment of inertia. 19. Area with polar coordinates: Demonstrate an understanding of polar coordinate system and its difference with Cartesian coordinate system, graphing and problems solution of such system. 20. Matrix: Explain the concept of matrix in mathematics, matrix algebra and solution of system of linear equations.		
Indicative Contents المحتويات الإرشادية	The topics listed under the indicative content below are the underpinning areas of knowledge and understanding that will be obtained from successful completion of the module. The mathematical topics are illustrated in the context of relevant engineering scenarios. • Integration: Definition, antiderivative, definite and indefinite integral. • Integration and transcendental functions: integration of trigonometric and inverse		

	trigonometric functions, integration of exponential and logarithmic functions, Integration of hyperbolic and inverse hyperbolic functions. • Numerical integration: Introduction, trapezoidal rule and Simpson's rule. • Methods of integration: Substitution method, integration by parts, Trigonometric substitution method, integration by partial fraction. • Application of definite integrals: Area, Volume, Lengths of curves in the plane, Areas of surfaces of revolution, Center of mass, moment of inertia. • Area of polar coordinates: Definition, polar equation, relating polar and Cartesian coordinates, Graph in polar coordinates, applications using polar coordinate system • Matrix: definition, matrix algebra, Determinant of matrix, Grammar's rule, Inverse of matrix, Gauss Elimination Method
Course Description	This course discusses the foundation for a robust understanding of mathematical concepts that underpin the various disciplines within engineering. It covers the integration and its types followed by methods of integration. The concept of numerical integration is also highlighted. Students will be able to utilize integration to solve several problems such as area between curves and volume by revolution. A focus is also given to the understanding of polar coordinate system and how to graph the curves and solve difficult integral in an easy way using such system. Matrix topic is also covered in this course so the students will be able to solve system of linear equations using matrix in different approaches. By the end of the course, students will have a sound understanding of these principles, preparing them for more advanced engineering courses in their respective fields

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Begin In Mathematics II, then employ a range of teaching strategies to ensure first-year engineering students fully grasp the various mathematical concepts. Instructional methods include interactive lectures, where core mathematical principles are explained in detail, and practical problem-solving sessions to provide hands-on learning experiences. Collaborative group work encourages peer-to-peer learning and reinforces understanding through shared insights. Regular formative assessments will be conducted to monitor students' understanding of the material, and feedback will be promptly given to guide their learning process. Instructors will maintain office hours for personalized support, and online resources will be available to supplement classroom instruction. Emphasis will be placed on relating mathematical concepts to real-world engineering applications to make the learning experience more relevant and engaging. These strategies aim to develop students' critical thinking skills, enhance their problem-solving abilities, and prepare them for advanced engineering studies.
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Student Workload (SWL)

الحمل الدراسي للطلاب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل		78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5.2
In class lectures	53			
In class tests	10			
Tutorial	15			
Unstructured SWL (h/sem)		72	Unstructured SWL (h/w)	4.8

الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Assignment	20		
Preparation for tests	30		
Homework	22		
Total SWL (h/sem)		150	
الحمل الدراسي الكلي للطلاب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

		Time (hr)	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3,5, 10, 12, 14	LO #1, 2, 3, 4,5 and 7
	Assignments	6	20% (20)	4, 8, 12	LO # 1, 2, 3, 4, 5 and 6
Summative assessment	Midterm Exam	2	20% (20)	7	LO # 1,4
	Final Exam	3	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	- Integration: - Definition, antiderivative, definite and indefinite integral
Week 2	- Integration and transcendental functions: (trigonometric and inverse trigonometric functions, exponential and logarithmic functions)
Week 3	- Integration and transcendental functions: - Integration and transcendental functions (hyperbolic and inverse hyperbolic functions)
Week 4	Numerical integration:- Introduction, trapezoidal rule and Simpson's rule
Week 5	Methods of integration :- Substitution method, integration by parts
Week 6	Methods of integration :- Trigonometric substitution method
Week 7	Methods of integration :- Integration by partial fraction method.
Week 8	Application of definite integrals:- Areas under the curve, area between curves,
Week 9	Application of definite integrals:- Volume by revolution
Week 10	Application of definite integrals:- Length of curve in the plane, Area of surface of revolution
Week 11	Application of definite integrals:- Center of mass, moment of inertia
Week 12	Application of definite integrals:- Area by polar coordinates
Week 13	Matrix:- Definition, matrix algebra
Week 14	Matrix:- Determinant of matrix, Grammar's rule
Week 15	Matrix:- Inverse of matrix, Gauss Elimination Method
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	George B. Thomas and Ross L. Finney, "Calculus and Analytic Geometry, Addison- Wesley	Yes
Recommended Texts	Thomas Calculus, by George B.Thomas,Jr,Elevnth Edition Media Upgrade 2008	Yes
Websites		

GRADING SCHEME

مخطط الدرجات

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

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

6- اللغة العربية

Module Information

معلومات المادة الدراسية

Module Title	اللغة العربية	Module Delivery
Module Type	نظري	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	UD12	
ECTS Credits	2	
SWL (hr/sem)	50	

Module Level	U	Semester of Delivery	2
Administering Department	Type Dept. Code	College	Type College Code
Module Leader		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor	Name(if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	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- تعريف الطلبة اهم المفاتيح الأساس في التعامل بلغة عربية فصيحة خالية من اي خطأ أو لحن وكيفية التعلم فيما يخص الأدب والنحو والبلاغة والاملاء العربية وكل هذا لغير الاختصاص. 2- رفع القدرات التعبيرية للطلّاب، وزيادة ثروتهم اللغوية ، ومساعدتهم على استخدام العبارة المناسبة بشكل دلالي واضح. 3- تدريب الطلبة على التحدث، والتنظيم المنطقي للأفكار، مع الحرص على التمسك باللغة العربية الفصحى . 4- رفع الأداء اللغوي العام لدى الطلبة. 5- تمكين الطلبة من الكتابة والتعبير والحديث بلغة عربية فصيحة وواضحة. 6- مساعدة الطلبة في التعبير عن افكارهم من خلال المناقشة والحوار بلغة سهلة وفصيحة . 7- جعل الطلبة قادرين على اكتساب خزين لغوي من الكلمات واللفاظ والتعبير الفصيحة. 8- تعلم الطلبة الحفاظ على لغة القرآن التراث العربي الاصيل. الاهداف المعرفية والمهارية:
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- يعرف اساليب اللغة العربية. 2- يوظف ادوات الترقيم عند الكتابة . 3- يتدرب على كيفية تحليل النصوص الادبية . 4- يعرب بعض الامثلة والتمارين عن الجملة الاسمية والفعلية . 5- يناقش بعض النصوص القرآنية والادبية . 6- يبين الفرق بين علامات الاعراب الاصلية والفرعية. 7- يميز بين الافعال والاسماء في الجمل. 8- يتدرب على القراءة الواضحة والإلقاء . 9- يتدرب على الكتابة بخط حسن من خلال التعريف بأنواع الخطوط العربية، وكتابة كل حرف، ثم كتاب الجمل والعبارات بخط الرقعة. 10- يميز بين حمزة القطع وهمزة الوصل عند الكتابة . 11- يميز بين حرفي الضاد والظاء في الكتابة والنطق. 12- يميز بين التاء المربوطة والمفتوحة اثناء الكتابة. 13- أحكام كتابة الضاد والظاء.
Indicative Contents المحتويات الإرشادية	توضيح أهمية اللغة العربية وفوائدها بالنسبة للطلّاب الجامعي (2 ساعة).

	اللغة، تفسير وتحليل أول عشرة آيات من سورة الكهف مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية. (2 ساعة) اللغة، تفسير وتحليل ثلاثة آيات من سورة الحجرات مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية. (2 ساعة) الادب، تحليل ثلاثة عشر سطرًا من قصيدة سفر أيوب في الشعر الحر للشاعر العراقي بدر شاكر السياب مع حياة الشاعر وأهم الأوجه البلاغية والنحوية في القصيدة. (2 ساعة) الادب، تحليل ثمانية أبيات في الحماس للشاعر أبي الطيب المتنبي مع حياة الشاعر مع أهم الأوجه البلاغية والنحوية في القصيدة. (2 ساعة) قواعد اللغة العربية وأهميتها معرفة اقسام الكلام(الاسم والفعل والحرف) وأهم علاماتها. قواعد اللغة العربية :- النكرة والمعرفة، انواع المعارف (العلم) شرح موضوع (اسم العلم والاسم المركب) مع الأمثلة. (2 ساعة) قواعد اللغة العربية، (الضمان) شرح موضوع(ضمان الرفع والنصب والجر) مع الامثلة. (2 ساعة) اللغة، حفظ وتفسير وتحليل سورة الاعلى مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية. الادب، تحليل ثمانية أبيات من قصيدة (كن بلسما) للشاعر (ابيليا ابي ماضي) مع حياة الشاعر مع أهم الحالات الاعرابية والبلاغية. (2 ساعة) قواعد اللغة العربية، شرح موضوع (اسماء الاشارة) مع الأمثلة وحالات الاعراب، شرح موضوع (المعرف بالإضافة) مع الأمثلة وحالات الاعراب. (2 ساعة) قواعد اللغة العربية، شرح موضوع (الحال) معرفة الحال وصاحبها وما هي انواع الحال مع الأمثلة وحالات الاعراب. (2 ساعة) الأملء في اللغة العربية، علامات الترفيم وأهميتها في اللغة العربية. (2 ساعة) قواعد اللغة العربية، شرح موضوع (العدد) معرفة تميز العدد وماهي اقسام العدد مع الأمثلة وحالات الاعراب.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	- المحاضرة والمشاركة. - المناقشة والحوار. - العصف الذهني. - كتابة التقارير عن الموضوع. - السؤال والجواب.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem)		60	

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
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	20% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	توضيح أهمية اللغة العربية وفوائدها بالنسبة للطلاب الجامعي.
Week 2	اللغة، تفسير وتحليل أول عشرة آيات من سورة الكهف مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية.
Week 3	اللغة، تفسير وتحليل ثلاثة آيات من سورة الحجرات مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية.
Week 4	الادب، تحليل ثلاثة عشر سطرًا من قصيدة سفر ايوب في الشعر الحر للشاعر العراقي بدر شاكر السياب مع حياة الشاعر وأهم الأوجه البلاغية والنحوية في القصيدة.
Week 5	الادب، تحليل ثمانية أبيات في الحماس للشاعر ابي الطيب المتنبي مع حياة الشاعر مع أهم الأوجه البلاغية والنحوية في القصيدة.
Week 6	قواعد اللغة العربية وأهميتها
Week 7	معرفة أقسام الكلام (الاسم والفعل والحرف) وأهم علاماتها.
Week 8	قواعد اللغة العربية :- النكرة والمعرفة، أنواع المعارف (العلم) شرح موضوع (اسم العلم والاسم المركب) مع الأمثلة.
Week 9	قواعد اللغة العربية، (الضمانر) شرح موضوع (ضمانر الرفع والنصب والجر) مع الأمثلة.
Week 10	اللغة، تفسير وتحليل سورة الأعلى مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية.
Week 11	الادب، تحليل ثمانية أبيات من قصيدة (كن بلسما) للشاعر (إيليا أبي ماضي) مع حياة الشاعر مع أهم الحالات الاعرابية والبلاغية.
Week 12	قواعد اللغة العربية، شرح موضوع (أسماء الإشارة) مع الأمثلة وحالات الاعراب، شرح موضوع (المعرف بالإضافة) مع الأمثلة وحالات الاعراب.
Week 13	قواعد اللغة العربية، شرح موضوع (الحال) معرفة الحال وصاحبها وما هي أنواع الحال مع الأمثلة وحالات الاعراب.
Week 14	الأملاء في اللغة العربية، علامات الترقيم وأهميتها في اللغة العربية.
Week 15	قواعد اللغة العربية، شرح موضوع (العدد) معرفة تميز العدد وماهي أقسام العدد مع الأمثلة وحالات الاعراب.
Week 16	الأملاء في اللغة العربية، احكام الهمزة (همزة الوصل، حمزة القطع، كتابة الهمزة في وسط الكلمة).
Week 17	الأملاء في اللغة العربية: احكام كتابة التاء المربوطة والمفتوحة والالف الممدودة والمقصورة.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. القرآن الكريم. 2. كتاب البلاغة والتطبيق.	Yes

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

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.				

Human Rights and Democracy –7

Module Information		
معلومات المادة الدراسية		
Module Title	<u>Human Rights and Democracy</u>	Module Delivery
Module Type	<u>Basic learning activities</u>	☒ Theory

Module Code	UD14		☒ Lecture ☐ Lab ☐ L Tutorial ☐ Practical ☐ Seminar		
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level			Semester of Delivery		
Administering Department		جميع اقسام الكلية	College	College of Engineering	
Module Leader			e-mail		
Module Leader’s Acad. Title		لجنة حقوق الانسان والديمقراطية	Module Leader’s Qualification		.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		12/06/2023	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	1. يتعلم الطالب خلال السنة الدراسية أساسيات حقوق الانسان والديمقراطية ما حقوقه كيف يدافع عنها بالطرق القانونية وماهي ضماناتها الداخلية والدولية. 2. استحصا المعرفة في مجال الديمقراطية وأنواع أنظمتها واثرا على حقوق الانسان . 3. تنمية شخصية الطالب وتعزيز وعيهم في الأنظمة السياسية الديمقراطية وتفصيلها وكيفية تطبيقها على ارض الواقع واهمية ان يكون فعال في المجتمع من خلال احترامه لحقوق الآخرين ومعرفة ان الحقوق والحريات تنتهي عند بداية حقوقهم وحرياتهم ويؤدي واجباته بدلا من اكتساب الحقوق فقط. 4. تعزيز ثقافة السلام القائمة على العدل والمساواة.
Module Learning Outcomes	1. تمكين الطالب من معرفة اساسيات الدفاع عن حقوقه وحقوق الآخرين بعد معرفتها ومعرفة أهميتها له وللمجتمع بصورة عامة وأيضا معرفة كل شخص حدود حقوقه وحريته . 2. تمكين الطالب في المشاركة السياسية وذلك من خلال معرفته بأهمية مشاركته في الانتخابات وتأثير هذه المشاركة على سير الانتخابات وتشكيل السلطة فيما بعد. 3. معرفة الطالب ضمانات حقوقه وحرياته وماهي مصادرها. 4. معرفة الفرق بين الحقوق والحريات. 5. تمكين الطالب من معرفة ماهي المفهوم العلمي للديمقراطية وماهي جذورها وانواعها واشكالها. 6. يتعلم الطالب كيف يؤثر النظام الديمقراطي على حقوق الانسان وماهي العلاقة بينها. 7. ادراك الطالب ضرورة ان يكون مواطن فعال في المجتمع ايضاً معرفه شروط الناخب وشروط المرشح للانتخابات. 8. معرفة أنظمة الانتخابات وايهما افضل. 9. فهم الطالب للقانون الدولي لحقوق الانسان وايضاً معرفة مختصرة عن المنظمات الدولية والية عملها كالأأم المتحدة ومنظمة الصليب الأحمر وغيرها.
Indicative Contents	الجزء الأول - تعريف حقوق الانسان وحقوق الانسان في الحضارات القديمة (تعريف الحق وتعريف الانسان ومعرفة أهمية حقوق الانسان بالنسبة للإنسان والمجتمع أيضا دراسة حقوق الانسان في الحضارات كالحضارة المصرية والعراقية واليونانية والرومانية) (4ساعات) الجزء الثاني معرف حقوق الانسان في الأديان السماوية واهمها الإسلام (2ساعة) مصادر حقوق الانسان تتضمن (مصادر دولية كالإعلان العالمي لحقوق الانسان والعهدان الدوليان والمصادر الإقليمية التي تشمل الاتفاقيات الإقليمية كالاتفاقية الأوروبية والأمريكية والدستور) (2ساعة)

ضمانات حقوق الانسان (كالضمانات الدستورية والقانونية) (٢ ساعة)
الاتفاقيات الدولية والإقليمية لحقوق الانسان (٢ ساعة)
الحريات العامة وأنواعها والمقارنة فيما بينها (٢ ساعة)
مستقبل حقوق الانسان والعولمة وحقوق الانسان (٢ ساعة)
تعريف وتاريخ وأنواع الديمقراطية (دراسة تعريف ونشأة وتطور الديمقراطية مبادئها وأنواعها كالديمقراطية المباشرة وغير المباشرة والنظام الرئاسي والبرلماني) (٦ ساعات)
تعريف الانتخاب وشروطه وأنواع النظم الانتخابية وتعريف المجلس النيابي (٦ ساعات)
العلاقة بين الديمقراطية وحقوق الانسان (٢ ساعة)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem)

الحمل الدراسي المنتظم للطلاب خلال الفصل

33

Structured SWL (h/w)

الحمل الدراسي المنتظم للطلاب أسبوعيا

2

Unstructured SWL (h/sem)

الحمل الدراسي غير المنتظم للطلاب خلال الفصل

17

Unstructured SWL (h/w)

الحمل الدراسي غير المنتظم للطلاب أسبوعيا

1.1

Total SWL (h/sem)

الحمل الدراسي الكلي للطلاب خلال الفصل

50

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	15% (10)	5 and 10	3, and #6 #LO #1, #2 #7#8
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report	1	15% (10)	13	LO #5, #8 and #9
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	محاضرة تعريفية عن المادة وأهميتها ..

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

Learning and Teaching Resources

مصادر التعلم والتدريس

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

Grading Scheme

مخطط الدرجات

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

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" **Semester 3**

No.	Module Code	Module Name in English
Semester 4		
1	CPE 201	Applied Mathematics I
2	CPE 203	Analogue Electronics
3	CPE 204	Digital Electronics
4	CPE 205	Data Structures and Algorithms
5	CPE 206	Software Engineering
6	UD24	Crimes of the Baath Regime in Iraq

No.	Module Code	Module Name in English
1	CPE 202	Applied Mathematics II
2	CPE 207	Computer Architecture
3	CPE 208	Object Oriented Programming
4	CPE 209	Database Systems
5	CPE 210	Microprocessor
6	UD21	English Language II
7	UD22	Arabic Language II



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية المرحلة الثانية / الفصل الأول

Applied Mathematics I

Module Information

معلومات المادة الدراسية

Module Title	Applied Mathematics I			Module Delivery	
Module Type	Basic			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	CPE 201				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		2	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Zobeda Hatif Naji		e-mail	zobedadahatifnaji@uodiyala.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		MSc.
Module Tutor	Zobeda Hatif Naji		e-mail	zobedahatifnaji@uodiyala.edu.iq	
Peer Reviewer Name		Hussien Y. Radhi Raghda Salam Ali	e-mail	hussienradh_eng@uodiyala.edu.iq raghdasalam@uodiyala.edu.iq	
Scientific Committee Approval Date		02/06/2024	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	E 102	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Upon completion of this course, the student will be able to understand: 1. Mathematics develops the mind to think in a logical and critical manner, hence enhancing the capacity to methodically tackle and resolve issues. 2. Mathematics enables individuals to comprehend and articulate patterns, connections, and structures seen in the natural world, ranging from planetary orbits to musical rhythms. 3. Developing Analytical Skills: Engaging in the study of mathematics improves one's ability to think analytically, enabling individuals to deconstruct intricate situations into more manageable components and comprehend the fundamental laws that govern them.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion this Course, the students will: 1. Learn the fundamental of Power Series, theory of the Power Series Method. Understand and solve the problem Fourier Analysis Arbitrary Period. Even and Odd Functions. Fourier Integral and Applications. 2. Know the Fourier Transform (DFT), Fast Fourier Transform (FFT) and inverse Fourier transform IFT. 3. Have Knowledge about Laplace Transforms, its properties, and its application. 4. Understand the inverse of Laplace Transforms for Derivatives and Integrals.
Indicative Contents المحتويات الإرشادية	1. Power Series Theory of the Power Series Method(7hrs). 2. Convergence & Divergence(1hrs). 3. Legendre Polynomials (2). 4. Extended Power Series, Euler(2hrs). 5. Fourier Analysis, Fourier Series(3hrs). 6. Arbitrary Period. Even and Odd Functions(3hr). 7. Approximation by Trigonometric Polynomials(2hrs). 8. Fourier Integral and Applications(4hrs). Fourier Transform. Discrete Fourier Transform (DFT) (4hrs). Fast Fourier Transform (FFT) and inverse Fourier transform IFT (3hrs). Laplace Transforms concept and properties(4hrs). Shifting Theorem(3hrs). Inverse Laplace Transforms(3hrs). Transforms of Derivatives and Integrals(hrs). Differential Equations, Initial Value Problems(4hrs)

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, homework's and examples. Practical examples helps students to understand the course material.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation المادة تقييم

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

Module Information

معلومات المادة الدراسية

Module Title	Analogue Electronics			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CPE 203				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		2	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Saad Mohammed Saleh		e-mail	saad.alazawi@uodiyala.edu.iq	
Module Leader’s Acad. Title		Professor	Module Leader’s Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		02/06/2024	Version Number		1.0

Relation with other Modules

المواد الدراسية الأخرى

Prerequisite module	CPE 108	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Content
المحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To understand the construction and operation of Bipolar Junction Transistor (BJT). 2. To understand and analyze the Biasing circuits of BJT. 3. The student learns the biasing circuits, the components and the operation of the MOSFET. 4. The student learns how to analyze Amplifier circuits of MOSFET transistors 5. The student learns the principles of operational amplifier applications.
Module Learning Outcomes تعلم للمادة الدراسية	1. Understand the construction and operation of BJT. 2. Learn and analyze the Biasing circuits of BJT. 3. Learn the types, construction and operation of the FET 4. Understand the operation of Enhancement MOSFET. 5. Understand the Characteristics of Enhancement MOSFET. 6. Learn the Biasing of Enhancement MOSFET. 7. Understand the MOSFET as an Amplification circuit 8. Learn the Small-Signal Equivalent Circuit Models. 9. Understand and analyze the Common source amplifier circuit 10. Understand and analyze the Common gate and common drain amplifier circuits 11. Learn the principles of Operational amplifier (OP-Amp) 12. Understand the application circuits of OP-Amp.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction: Overview about P.N Junction; (3 hrs) • Bipolar Junction Transistors (BJT): Construction, Operation and biasing (9 hrs) • Overview about Field Effect Transistors types (3 hrs) • MOSFET: types, operation and construction (3 hrs) • Operation, Characteristics and Biasing of Enhancement MOSFET (9 hrs) • Amplifier circuits of Enhancement MOSFET (3 hrs) • Small-Signal Equivalent Circuit Models Enhancement MOSFET amplifier (9 hrs) • Application Circuits of the Operational Amplifiers (OP Amp) (6 hrs)

Learning and Teaching Strategies نتائج التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, homework's and examples. Practical examples helps students to understand the course material.
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Student Workload (SWL) الحمل الدرايس للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدرايس المنتظم للطلاب أسبوعيا	3.2
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Unstructured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Overview about P-N Junction
Week 2	Bipolar Junction Transistors (BJT): Construction and Operation
Week 3	Biasing Circuits and DC Load line of BJT
Week 4	Biasing Circuits and DC Load line of BJT
Week 5	Overview about Field Effect Transistors
Week 6	MOSFET: types, operation and construction
Week 7	Enhancement MOSFET: characteristics and regions of operation
Week 8	Characteristics of Enhancement MOSFET
Week 9	Biasing of Enhancement MOSFET
Week 10	MOSFET as an Amplifier and Small-Signal Equivalent Circuit Models

Week 11	Current Mirror
Week 12	Common Source Amplifier.
Week 13	Common Gate Amplifier.
Week 14	Common Drain (Source Follower) Amplifier.
Week 15	Application Circuits of the Operational Amplifiers (OP Amp)
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر

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

Learning and Teaching Resources مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Sedra and Smith, <i>Microelectronic Circuits</i> , Oxford University Press, Sixth Edition, 2010	Yes
Recommended Texts	- Neamen, <i>Microelectronics - Circuit Analysis and Design</i>, McGraw-Hill, 2010. - Behzad Razavi, <i>Fundamentals of Microelectronics</i>, John Wiley & Sons, Preview Edition, 2006 - Jimmie J. Cathey, Ph.D, <i>Theory and Problems of Electronic Devices and Circuits</i>, 2nd Edition, 2002. - Robert L. Boylestad and Louis Nashelsky, <i>Electronic Devices and Circuit Theory</i>, 7th or 10th or 11th Edition. - Any other materials available on the web.	No
Websites	https://youtube.com/playlist?list=PLo6jdcSSoHsLQGLzFrU6tg3e12IS_GDSZ&feature=shared	

Grading Scheme

مخطط الدرجات

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

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

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Power Series: Theory of the Power Series Method.
Week 2	Convergence & Divergence.
Week 3	Legendre Polynomials.
Week 4	Extended Power Series: Euler.
Week 5	Fourier Analysis: Fourier Series.
Week 6	Arbitrary Period. Even and Odd Functions.
Week 7	Approximation by Trigonometric Polynomials. Fourier Integral and Applications
Week 8	Fourier Transform. Discrete Fourier Transform (DFT), Fast.
Week 9	Fourier Transform (FFT) and inverse Fourier transform IFT.
Week 10	Laplace Transforms properties.
Week 11	Shifting Theorem.
Week 12	Inverse Laplace Transforms.
Week 13	Transforms of Derivatives and Integrals. Differential Equations, Initial Value Problems.
Week 14	Course Report.

Week 15	Midterm Exam.
Week 16	Preparatory week before the final Exam.

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	R.K.Jain and S.R.K Iyengar, <i>Advanced Engineering Mathematics</i> , 3 rd Edition, Narosa Publishing House, 2009.	Yes
Recommended Texts	Kenneth Stroud, <i>Advanced Engineering Mathematics</i> , 5 th Edition □K. F. Riley, <i>Mathematical-Methods for Physics & Engineering- Comprehensive Guide</i> , 3 rd Edition. □Murray Spiegel, <i>Schaum's Outline of Fourier Analysis with Applications</i>	Yes

Websites

<https://math.mit.edu/~gs/books/itam.html>

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Grading Scheme

مخطط الدرجات

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

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

Module Information

معلومات المادة الدراسية

Module Title	<u>Digital Electronics</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 204</u>				
ECTS Credits	<u>6</u>				
SWL (hr/sem)	150				
Module Level		2	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Royida A. Ibrahim		e-mail	royida.alhayali@uodiyala.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		MCS

Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	02/06/2024	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CPE 106	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Upon completion of this course, the student will be able to: - Learn how to deal with flip flops. - Learn how to develop meter design. - Familiarity with the basic concepts of the types and types of transfer records. - Familiarity with the method of designing information transfer circuits as well as logical programmed devices. - The student learns the types of programmed logic devices as well as sequential logic circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Enabling the student to understand the basic concepts and structure of counters, including their types and applications. - Enabling the student to learn the conversion registers. - Enabling the student to understand the solutions of problems related to Learn programmable logic devices, programmable logic arrays. - Enabling the student to learn about diodes and their types.
Indicative Contents المحتويات الإرشادية	- Introduction to the types of synchronous and asynchronous counters, the cascade counter and counter applications. (6 Hrs) - The conversion register, its types and applications. (6 Hrs) - Information conversion circuits, their types and applications. the diodes and their types. (12 Hrs) - Programmable logic devices, programmable logic arrays, general matrix logic, and an introduction to sequential logic circuits. (21 Hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- The lecturer prepares lectures on the subject in paper and electronic form and presents them to the students.
- The lecturer delivers lectures in detail.
- The lecturer requests periodic reports and homework assignments on the basic topics of the subject.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	6 and 14	LO #1 to #4
	Assignments	2	10% (5)	4, 7 and 10	LO #1, #2 and #5
	Projects / Lab.	1	10% (10)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 to #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview about introduction to the types of synchronous counters.
Week 2	Overview about introduction to the types of asynchronous counters.
Week 3	The cascade counter.
Week 4	Counter applications.
Week 5	Conversion register, its types and applications(Kinds of Shift register).
Week 6	Shift register Applications.
Week 7	Data Conversion circuits: Analog to Digital Conversion (ADC) ,ADC methods.

Week 8	ADC methods.
Week 9	Digital to Analog Conversion (DAC), DAC methods.
Week 10	DAC methods.
Week 11	Diode–Transistor–Logic.
Week 12	Programmable Logic Devices.
Week 13	Programmable Logic Array (PLA).
Week 14	Programmable Array Logic.
Week 15	Introduction Sequential Logic Circuit.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to using the software.
Week 2	Synchronous counters.
Week 3	Synchronous counters.
Week 4	Asynchronous counters.
Week 5	Asynchronous counters.
Week 6	Kinds of Shift register
Week 7	ADC methods.
Week 8	ADC methods.
Week 9	DAC methods.
Week 10	DAC methods.
Week 11	Diode–Transistor–Logic.
Week 12	Programmable Logic Devices.
Week 13	Programmable Logic Array (PLA).
Week 14	Programmable Array Logic.
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas I. Floyd, DIGITAL FUNDAMENTALS,	Yes
Recommended Texts	- Anil K. Maini, Digital Electronics Principles, Devices and Applications. M. Morris Mano, Digital Design, - Sir.C.V.Raman Nagar, Tirunelveli-12, Digital Principles and System Design.	No

- John Crowe and Barrie Hayes-Gill, Introduction to Digital Electronics.

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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Module Information

معلومات المادة الدراسية

Module Title	<u>Software Engineering</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 206</u>				
ECTS Credits	<u>6</u>				
SWL (hr/sem)	<u>150</u>				
Module Level		2	Semester of Delivery		3
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Dr. Khalid Jamal Jadaa		e-mail	Khalid.jamal.jadaa@uodiyala.edu.iq	
Module Leader’s Acad. Title			Module Leader’s Qualification		
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Ghassan Khazal Ali	e-mail	Ghassan_khazal@uodiyala.edu.iq	
Scientific Committee Approval Date		02/06/2024	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	Upon completion of this course, the student will be able to: 42. List and describe the fundamental phases of the Software Development Lifecycle (SDLC) 43. Define and describe fundamental software engineering terminology and coding practices 44. Explore/explain relationships between software engineering and other engineering disciplines (Systems Engineering, Electrical and Computer Engineering, Industrial Engineering) 45. Modify/build a software program that introduces students to software development tools / environments 46. Troubleshoot and debug changes made to an existing software program 47. Develop an original Python software program, learning basic Python language syntax 7. Build a foundation for academic success in the Software Engineering degree program
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	45. Describe basic software development and computing fundamentals that make up the Software Development Lifecycle. 46. Explore relationships between software engineering and other engineering disciplines (Systems Engineering, Electrical and Computer Engineering, Industrial Engineering, and Computer Science) 47. Experiment with and use traditional software development process and testing tools, such as configuration management, interpreters/compilers and debuggers. 48. Analyze the functionality and performance of software application programs 49. Compare and contrast how diverse software applications produce solutions to meet specific objectives/needs in a variety of fields including, but not limited to public health, safety, global, cultural, social, environmental, and economic applications 50. Demonstrate and communicate software engineering principles effectively through written reports and/or verbal presentations. 51. Summarize both ethical and professional responsibilities of a software engineer. 52. Build a foundation for academic success in the Software Engineering degree program.

Indicative Contents

المحتويات الإرشادية

1. Introduction to Software Engineering:

- **What is Software Engineering?** Definition, goals, principles, and importance in today's world.
- **The Software Development Lifecycle (SDLC):** Various models (Waterfall, Agile, Spiral, etc.), their advantages and disadvantages.
- **Software Engineering Ethics and Professionalism:** Code of ethics, social impact of software, and responsible software development.

2. Requirements Engineering:

- **Elicitation and Analysis:** Gathering, analyzing, and documenting user needs, functional and non-functional requirements.
- **Requirements Specification and Validation:** Writing clear and unambiguous requirements documents, techniques for validation and verification.
- **Requirements Management:** Tracking, controlling, and managing changes to requirements throughout the development process.

3. Software Design:

- **Design Principles:** Principles like modularity, abstraction, cohesion, coupling, etc.
- **Architectural Design:** High-level design, choosing the right architecture for the project (layered, client-server, etc.).
- **Detailed Design:** Designing individual components, data structures, algorithms, and interfaces.
- **Design Patterns:** Common reusable solutions for recurring design problems.

4. Software Construction:

- **Coding Standards and Best Practices:** Adhering to coding conventions, writing clean and maintainable code.
- **Testing:** Unit testing, integration testing, system testing, user acceptance testing, and different types of testing methods.
- **Debugging and Troubleshooting:** Finding and fixing bugs, techniques for debugging and tracing errors.

5. Software Deployment and Maintenance:

- **Deployment Strategies:** Release planning, deployment methods, and managing different environments.
- **Software Maintenance:** Corrective, adaptive, perfective maintenance, and managing software evolution.
- **Software Configuration Management:** Version control systems, managing source code and other project artifacts.
- **Software Quality Assurance:** Quality metrics, software quality assurance methods, and ensuring the delivered software meets requirements.

6. Software Project Management:

- **Project Planning and Estimation:** Defining project scope, creating timelines, and estimating effort and resources.
- **Risk Management:** Identifying, assessing, and mitigating risks throughout the project lifecycle.
- **Team Management:** Communication, collaboration, and leadership skills for managing software development teams.
- **Software Metrics and Measurement:** Tracking progress, measuring performance, and improving development processes.

7. Advanced Software Engineering Topics (Optional):

- **Software Architecture and Design Patterns:** In-depth study of architectural patterns and design patterns.
- **Software Security:** Secure coding practices, vulnerabilities, and security testing.
- **Software Reliability and Fault Tolerance:** Ensuring software robustness and

resilience to errors.

- **Software Engineering for Cloud and Mobile Applications:** Developing software for modern platforms.
- **Agile Software Development:** Deep dive into Agile methodologies like Scrum and Kanban.
- **DevOps and Continuous Integration/Continuous Delivery (CI/CD):** Automating software development and deployment processes.

8. Case Studies and Practical Projects:

- Applying the principles of software engineering through real-world case studies and hands-on projects.
- This helps students understand the practical application of the concepts learned in theory.

9. Tools and Technologies:

- Introduction to popular software engineering tools and technologies like:
 - **Version Control Systems:** Git, SVN
 - **Integrated Development Environments (IDEs):** Eclipse, Visual Studio, IntelliJ IDEA
 - **Project Management Tools:** Jira, Trello
 - **Testing Tools:** JUnit, Selenium
 - **Modeling Tools:** UML modeling tools

Assessment:

Assessment can include:

- Assignments and projects
- Quizzes and exams
- Class participation
- Presentation and reports

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

1. Project-Based Learning (PBL) at the Core:

- **The Principle:** Students learn best by doing. PBL allows them to apply theoretical concepts to real-world problems.
- **Implementation:**
 - **Small, Iterative Projects:** Start with smaller projects that build on each other.
 - **Teamwork:** Encourage collaboration, communication, and conflict resolution within teams.
 - **Real-World Relevance:** Connect projects to actual industry challenges or real-world issues.
 - **Feedback and Iteration:** Regular feedback and opportunities to refine designs and code based on feedback.

2. Agile Learning Methodology:

- **The Principle:** Agile principles focus on flexibility, collaboration, and continuous improvement. This aligns well with modern software development practices.
- **Implementation:**
 - **Short Iterations:** Break down projects into short sprints (1-2 weeks) to allow for flexibility and rapid feedback.
 - **Daily Stand-ups:** Brief daily team meetings to discuss progress, roadblocks, and upcoming tasks.

- **Frequent Demonstrations:** Regular show-and-tell sessions where teams present their work and receive feedback.
 - **Retrospectives:** Reflecting on each sprint to identify areas for improvement in processes and collaboration.
- 3. Hands-on Coding and Tools:**
- **The Principle:** Theoretical concepts become tangible when students write code and use industry-standard tools.
 - **Implementation:**
 - **IDEs and Version Control:** Ensure students are proficient with an IDE (e.g., Visual Studio, Eclipse) and a version control system (e.g., Git).
 - **Open Source Projects:** Encourage contributing to or studying open-source projects to gain experience.
 - **Coding Challenges and Exercises:** Regularly assign coding exercises to reinforce concepts and develop problem-solving skills.
- 4. Industry Guest Speakers and Mentors:**
- **The Principle:** Real-world perspectives and insights from professionals can inspire and guide students.
 - **Implementation:**
 - **Guest Lectures:** Invite software engineers or project managers to share their experiences and challenges.
 - **Mentorship Programs:** Connect students with industry professionals for guidance and career advice.
 - **Case Studies:** Present real-world case studies of software projects, highlighting challenges, decisions, and outcomes.
- 5. Emphasis on Soft Skills:**
- **The Principle:** Software engineering is not just about technical skills; effective communication, teamwork, and problem-solving are crucial.
 - **Implementation:**
 - **Communication Exercises:** Emphasize clear and concise communication in project reports, presentations, and team interactions.
 - **Teamwork Dynamics:** Encourage students to work in diverse teams and learn to navigate different personalities and work styles.
 - **Problem-Solving Techniques:** Develop analytical and critical thinking skills to tackle complex software engineering problems.
- 6. Balancing Theory and Practice:**
- **The Principle:** A strong theoretical foundation is essential, but it must be grounded in practical application.
 - **Implementation:**
 - **Interactive Lectures:** Integrate coding demonstrations, interactive exercises, and case studies into lectures.
 - **Project-Driven Learning:** Frame theoretical topics within the context of the ongoing project work.
 - **Assignments with Real-World Applications:** Structure assignments that directly relate to industry practices and software engineering challenges.
- 7. Continuous Assessment and Feedback:**
- **The principle:** Regular feedback and assessment help students identify areas for improvement and track their progress.
 - **Implementation:**
 - **Frequent Code Reviews:** Peer and instructor code reviews to provide constructive feedback on code quality and design.
 - **Project Milestones:** Regular deadlines and milestones for project deliverables, allowing for ongoing assessment.
 - **Self-Assessment:** Encourage students to reflect on their learning and progress through self-assessment exercises.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	6 and 12	LO #1 to #4 and #6 to #8
	Assignments	2	10% (5)	4, 7 and 10	LO #2, #3, #4, #5 and #7, #8, #9
	Projects / Lab.	1	10% (10)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction
Week 2-3	Software processes
Week 4	Agile software development
Week 5-6	Requirements engineering
Week 7	System modeling
Week 8	Architectural design

Week 9-10	Design and implementation
Week 11-12	Software testing
Week 12-13	Software evolution
Week 14-15	Project management
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Software Engineering Lab - Setting Up Development Environment, Version Control Systems
Week 2-3	Software Requirements Analysis - Use Case Diagrams, Data Flow Diagrams, Entity Relationship Diagrams
Week 4-5	System Design - Class Diagrams, Sequence Diagrams, Activity Diagrams
Week 6-7	Implementation and Coding - Coding techniques, Unit Testing
Week 8-9	Integration and Testing - Integration Testing, Debugging Techniques
Week 10-11	Design Project1 E-binding
Week 12-13	Design Project 2 electronic cash counter

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Software Engineering, 10th Edition Author: by Ian Sommerville, pearson , 2016 - Tony Gaddis, "Starting out with Visual C#.", Fourth edition, Boston, Pearson Inc., 2017.	Yes
Recommended Texts	- ROGER S. PRESSMAN BRUCE R. MAXIM Software Engineering a practitioner's approach, NINTH EDITION, 2019. - Ian Sommerville - Engineering Software Products_ An Introduction to Modern Software Engineering-Pearson (2020) - Salvatore A. Buono, "C# and Game Programming: A Beginner's Guide." Second Edition, Boca Raton, CRC Press Inc., 2019. - Faraz Rasheed, "Programmer's Heaven: C# School.", First Edition, Fuengirola, Synchron Data, 2006.	No
Websites	_Any other materials available on the web	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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Module Information

معلومات المادة الدراسية

Module Title	جرائم نظام البعث في العراق			Module Delivery	
Module Type	Basic learning activities			☒ Theory ☒ Lecture ☐ Lab ☐ L Tutorial ☐ Practical ☒ Seminar	
Module Code	UD24				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		2	Semester of Delivery		
Administering Department		جميع اقسام الكلية	College	College of	
Module Leader			e-mail		
Module Leader’s Acad. Title			Module Leader’s Qualification		MSc.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		9/09/2024	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	5. التعرف على ماهية الجريمة لغة واصطلاحاً وماهية أقسام الجرائم. 6. التعرف على جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م. 7. تنمية وعي الطالب بجرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا لسنة 2005م. 8. دراسة الجرائم التي ارتكبتها نظام البعث على مدى سنوات طويلة واثارها النفسية والاجتماعية . 9. التعرف على صور انتهاكات حقوق الانسان وجرائم السلطة والتعرف على الجرائم البيئية لنظام البعث في العراق. 10. تعزيز الوعي بحقيقة ما جرى من مآسي المقابر الجماعية المرتكبة من النظام البعثي في العراق.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	10. تمكين الطالب من معرفة المفاهيم النظرية للجرائم وأركان الجرم . 11. تمكين الطالب من معرفة أقسام الجرائم . 12. تمكين الطالب من معرفة قانون المحكمة الجنائية العراقية العليا لسنة 2005. 13. فهم تشكيل المحكمة الجنائية العراقية العليا لسنة 2005 والتعرف على تشكيل المحكمة إجراءات التقاضي امام المحكمة. 14. يتعلم الطالب أنواع الجرائم الدولية على وفق النظام الاساسي للمحكمة الجنائية الدولية. 15. معرفة الطالب بالاثار النفسية والاجتماعية لجرائم نظام البعث. 16. يتمكن الطالب من فهم موقف النظام البعثي من الدين من خلال فهم عقيدة النظام السياسي سبباً لفهم موقف النظام من الدين. 17. يتمكن الطالب من التعرف على صور انتهاكات القوانين العراقية وانتهاكات حقوق الانسان وجرائم السلطة. 18. تمكين الطالب من التعرف على بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث. 19. يتعرف الطالب على أماكن السجون والاحتجاز لنظام البعث. 20. معرفة الطالب بالجرائم البيئية وبأثار الجرائم البيئية لنظام البعث، ويتعرف جرائم المقابر الجماعية.
Indicative Contents المحتويات الإرشادية	الجزء الاول : جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا لعام 2005م، والجرائم النفسية والاجتماعية وأثارها وابرز انتهاكات النظام البعثي في العراق: التعريف بالجريمة لغة واصطلاحاً، اركان واقسام الجريمة (2 ساعة). جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م : أنواع الجرائم الدولية، القرارات الصادرة من المحكمة الجنائية العليا (2 ساعة). وابرز القضايا التي نظرت فيها المحكمة (2 ساعة). الجرائم النفسية والاجتماعية وأثارها وابرز انتهاكات النظام البعثي في العراق: الجرائم النفسية، اليات الجرائم النفسية (2 ساعة). اثار الجرائم النفسية ، الجرائم الاجتماعية (2 ساعة) . عسكرة المجتمع، موقف النظام البعثي من الدين (2 ساعة) . انتهاكات القوانين العراقية، صور انتهاكات حقوق الانسان (2 ساعة) . جرائم السلطة، بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث، أماكن السجون والاحتجاز لنظام البعث (2 ساعة). الجزء الثاني : الجرائم البيئية لنظام البعث في العراق، جرائم المقابر الجماعية : الجرائم البيئية لنظام البعث في العراق: التلوث الحربي والاشعاعي – استعمال الاسلحة المحرمة دولياً ومخاطر الالغام. (2 ساعة). التلوث بالمواد المشعة، أثار استخدام الاسلحة المحرمة دولياً (2 ساعة). تدمير المدن والقرى (سياسة الارض المحروقة): قصف المدن، قصف العتبات المقدسة والمساجد والحسينيات، معركة نهر جاسم ، حرق آبار النفط (2 ساعة). تجفيف الاهوار و أثارها البيئية والاجتماعية والاقتصادية (2 ساعة) ، تجريف بساتين النخيل والاشجار والمزروعات (2 ساعة). جرائم المقابر الجماعية وموقف الامم المتحدة منها (2 ساعة). احداث المقابر الجماعية المرتكبة من النظام البعثي في العراق، التصنيف الزمني لمقابر ابادة الجماعية في العراق للمدة 1963- 2003 (2 ساعة).

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- زيادة وعي الطالب بالجرائم التي ارتكبتها نظام البعث في العراق وحقيقة ما جرى من مآسي وويلات بحق الشعب العراقي. 2- اكتساب الطالب ثقافة عامة بماهية الجرائم واركانها واقسامها وموقف المشرع العراقي منها. 3- زيادة وعي الطالب بموقف القانون الدولي والمحاکم الجنائية الدولية من الجرائم والانتهاكات التي ترتكبتها الانظمة السلطوية.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعاً

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

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	محاضرة تعريفية عن المادة وأهميتها.
Week 2	التعريف بالجريمة لغة واصطلاحاً، أقسام الجريمة، جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م ، أنواع الجرائم الدولية.
Week 3	القرارات الصادرة من المحكمة الجنائية العليا، وأبرز القضايا التي نظرت فيها المحكمة.
Week 4	الجرائم النفسية، اليات الجرائم النفسية.
Week5	اثار الجرائم النفسية، الجرائم الاجتماعية
Week 6	عسكرة المجتمع، موقف النظام البعثي من الدين.
Week 7	انتهاكات القوانين العراقية، صور انتهاكات حقوق الانسان، جرائم السلطة.
Week 8	بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث، أماكن السجون والاحتجاز لنظام البعث.
Week 9	الجرائم البيئية لنظام البعث في العراق: التلوث الحربي والاشعاعي – استعمال الاسلحة المحرمة دولياً ومخاطر الالغام.
Week 10	التلوث بالمواد المشعة، آثار استخدام الاسلحة المحرمة دولياً

Week 11	تدمير المدن والقرى (سياسة الأرض المحروقة).
Week 12	تجفيف الأهوار أثارها البيئية والاجتماعية والاقتصادية.
Week 13	تجريف بساتين النخيل والأشجار والمزروعات.
Week 14	جرائم المقابر الجماعية، أحداث المقابر الجماعية المرتكبة من النظام البعثي في العراق.
Week 15	التصنيف الزمني لمقابر الإبادة الجماعية في العراق للمدة 1963 - 2003.
Week 16	الامتحان النهائي

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	المنهج المقرر الدراسي للجامعات الحكومية و الأهلية كافة كتاب وزارة التعليم والبحث العلمي ذي العدد (ت م 3 / 7588 في 2023/10/19)	نعم
Recommended Texts		لا
Websites		

Grading Scheme

مخطط الدرجات

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

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

Module Information

معلومات المادة الدراسية

Module Title	<u>Data Structures and Algorithms</u>	Module Delivery
Module Type	<u>Core</u>	☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>CPE 205</u>	
ECTS Credits	<u>6</u>	
SWL (hr/sem)	150	

Module Level	2	Semester of Delivery	3
Administering Department	Computer Eng.	College	College of Engineering
Module Leader	Dhafer Taha Shihab	e-mail	dhaferishihab@uodiyala.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	02/06/2024	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CPE 102	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Upon completion of this course, the student will be able to: 12. To provide the knowledge of basic data structures and their implementations. 13. To understand importance of data structures in context of writing efficient programs. 14. To develop skills to apply appropriate data structures in problem solving. 15. To provide the knowledge of categorizing efficiency of Algorithms in time and memory use. 16. To provide the knowledge of sorting and searching algorithms
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon Completion this Course, the students will able to: 7. Learn the basic types for data structure, implementation and application. 8. Know the strength and weakness of different data structures. 9. Use the appropriate data structure in context of solution of given problem. 10. Learn some idea of how to work out the efficiency of an algorithm 11. Develop programming skills which require to implement sorting and searching algorithms.

Indicative Contents

المحتويات الإرشادية

- Introduction to Data Structures, Single Linked Lists, Linked Lists Functions (3 hrs).
- Reverse List, Double Linked Lists, Stack and its Algorithms, Stack Implementation using Array (3 hrs).
- Stack Implementation Using Linked Lists, Applications of Stack, Infix to Postfix Notation, Evaluation of Postfix Expression (3 hrs)
- Queue and its Algorithms, Queue implementation using Array, Stack Implementation Using Linked Lists. (3 hrs)
- Circular Queue and its Algorithms, Circular Queue implementation using Array, Circular Queue implementation using Linked List. (3 hrs)
- Trees and its terminologies, Types of Tree and its operations. (3 hrs)
- Tree Traversals, recursion and non-recursion traversals. (3 hrs)
- Tree Applications. (3 hrs)
- Graph and its terminologies, Representation of Graph, Operations of graph. (3hrs)
- Graph Applications, Breadth First Search (BFS), Depth First Search (DFS) (3 hrs)
- Minimum Spanning Tree, Shortest Path. (3 hrs)
- Searching,, Big Oh-O Notation, Efficiency Considerations in Sorting Algorithms. (3 hrs)
- Linear Search, Analysis of Linear Search, Binary Search, Analysis of Binary search. (3 hrs)
- Sorting, Efficiency Considerations in Sorting Algorithms, Bubble Sort. (3 hrs)
- Insertion Sort, Quick Sort, Heap Sort. (3 hrs)

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, homework's and examples. Practical examples helps students to understand the course material.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	78	Structured SWL (h/w)	5.2
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	72	Unstructured SWL (h/w)	4.8
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem)	150		
الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	7 and 14	LO #2 and #5
	Assignments	2	10% (5)	11 and 13	LO #4 and #5

	Projects / Lab.	1	10% (10)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Data Structures, Single Linked Lists, Linked Lists Functions
Week 2	Reverse List, Double Linked Lists, Stack and its Algorithms, Stack Implementation using Array
Week 3	Stack Implementation Using Linked Lists, Applications of Stack, Infix to Postfix Notation, Evaluation of Postfix Expression
Week 4	Queue and its Algorithms, Queue implementation using Array, Stack Implementation Using Linked Lists,
Week 5	Circular Queue and its Algorithms, Circular Queue implementation using Array, Circular Queue implementation using Linked List.
Week 6	Trees and its terminologies, Types of Tree and its operations
Week 7	Tree Traversals, recursion and non-recursion traversals
Week 8	Tree Applications
Week 9	Graph and its terminologies, Representation of Graph, Operations of graph,
Week 10	Graph Applications, Breadth First Search (BFS), Depth First Search (DFS)
Week 11	Minimum Spanning Tree, Shortest Path
Week 12	Searching,, Big Oh-O Notation, Efficiency Considerations in Sorting Algorithms
Week 13	Linear Search, Analysis of Linear Search, Binary Search, Analysis of Binary search
Week 14	Sorting, Efficiency Considerations in Sorting Algorithms, Bubble Sort.
Week 15	Insertion Sort, Quick Sort, Heap Sort
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Implementing singly Linked List

Week 2	Implementing Doubly Linked List
Week 3	Implementing Stack using Array and Linked List
Week 4	Implementing Stack applications
Week 5	Implementing Queue using Array and Linked List
Week 6	Implementing Tree Algorithms
Week 7	Implementing Tree Applications
Week 8	Implementing Tree Applications (cont.)
Week 9	Implementing Graph
Week 10	Implementing Minimum Spanning Tree
Week 11	Implementing Shortest Path
Week 12	Implementing Linear Search and Binary Search
Week 13	Implementing Bubble Sort
Week 14	Implementing Insertion Sort
Week 15	Implementing Heap Sort and Quick Sort

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Vinu V Das, Principles of Data Structures Using C and C++	No
Recommended Texts	- Ramesh Vasappanavara, Anand Vasappanavara, Data Structures using C by practice. - D.S. MALIK, Data Structures Using C++, second edition, 2nd Edition. - Robert L. Kruse, Alexander J. Ryba, Data Structures and Program Design in C++.	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 المرحلة الثانية / الفصل الثاني

Module Information

معلومات المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Applied Mathematics II</u>			Module Delivery
Module Type	<u>Basic</u>			☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>CPE 202</u>			
ECTS Credits	<u>4</u>			
SWL (hr/sem)	<u>100</u>			
Module Level	2	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering
Module Leader	Zobeda Hatif Naji		e-mail	zobedadahatifnaji@uodiyala.edu.iq
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification	MSc.
Module Tutor	Zobeda Hatif Naji		e-mail	zobedahatifnaji@uodiyala.edu.iq
Peer Reviewer Name		Hussien Y. Radhi Raghda Salam Ali	e-mail	hussienradh_eng@uodiyala.edu.iq raghdasalam@uodiyala.edu.iq
Scientific Committee Approval Date		02/06/2024	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CPE 201	Semester	3
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية

Upon completion of this course, the student will be able to understand:

1. Mathematics develops the mind to think in a logical and critical manner, hence enhancing the capacity to methodically tackle and resolve issues.
2. Mathematics enables individuals to comprehend and articulate patterns, connections, and structures seen in the natural world, ranging from planetary orbits to musical rhythms.
3. Developing Analytical Skills: Engaging in the study of mathematics improves one's ability to think analytically, enabling individuals to deconstruct intricate situations into more manageable components and comprehend the fundamental laws that govern them.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية

Upon Completion this Course, the students will

1. Understand the fundamental elements of relational mathematical applied material.
2. Know the ordinary equation, its types, applications, and Partial Differential Equations (PDEs)
3. Understanding Multiple integrals and will be able to solve the problem.
4. Know the principles of Wavelet and solve the problem.
5. Understand the basic concepts of PDEs, Modeling: Vibrating, String, Wave Equation, Solution by Separating Variables.
6. How to use of Fourier Series, Laplacian in Polar Coordinates, Fourier–Bessel Series, Laplace's Equation in Cylindrical and Spherical Coordinates.

Indicative Contents المحتويات الإرشادية

1. First-Order ODEs: Separable ODEs. Modeling, Exact ODEs. Integrating Factors(3hr)
2. Existence and Uniqueness of Solutions for (IVP)(2hr)
3. Applied problems(2hr)
4. Second-Order Linear ODEs: Homogeneous Linear ODEs of Second Order(2hrs)
5. Homogeneous Linear ODEs with Constant Coefficients(2hrs)
6. Nonhomogeneous ODEs and Applied problems(2hrs)
7. Multiple integral: Mathematical definition(4hr)
8. Methods of integration(4hrs)
9. Multiple improper integral(2hrs)
10. Multiple integrals and iterated integrals(2hrs)
11. Some practical applications(3hrs)
12. Partial Differential Equations: Basic Concepts of PDEs(2hr)
13. Modeling: Vibrating String, Wave Equation(5hrs)
14. Solution by Separating Variables. Use of Fourier Series(2hrs)
15. Laplacian in Polar Coordinates. Fourier–Bessel Series(2hrs)
16. Laplace's Equation in Cylindrical and Spherical Coordinates. (2hrs)
17. Solution of PDEs by Laplace Transforms(2hrs)
18. Wavelet(1hr)
19. Wavelet bases for discrete and continuous variables. (2hrs)
20. The Haar basis. (1hr)
21. Differentiable wavelet bases(1hr).

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
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	20% (10)	2 and 13	LO #2 and #5
	Assignments	2	10% (5)	11 and 14	LO #1 and #6
	Class work	2	10% (5)		
	Home work				
	Projects / Lab.				
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #4
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to First-Order ODEs Separable ODEs. Modeling
Week 2	Exact ODEs. Integrating Factors, Existence and Uniqueness of Solutions for (IVP), Applied problems
Week 3	Second-Order Linear ODEs, Homogeneous Linear ODEs of Second Order, Homogeneous Linear ODEs with Constant Coefficients.
Week 4	Multiple integral: Mathematical definition, Methods of integration.
Week 5	Multiple improper integral, Multiple integrals and iterated integral.
Week 6	Some practical applications.
Week 7	Partial Differential Equations: Basic Concepts of PDEs, Modeling: Vibrating String, Wave Equation.
Week 8	Solution by Separating Variables. Use of Fourier Series.
Week 9	Midterm Exam.
Week 10	Laplacian in Polar Coordinates. Fourier–Bessel Series

Week 11	Laplace's Equation in Cylindrical and Spherical Coordinates.
Week 12	Solution of PDEs by Laplace Transforms
Week 13	Wavelet
Week 14	Wavelet bases for discrete and continuous variables. The Haar basis. Differentiable wavelet bases
Week 15	Course Report.
Week 16	Preparatory week before the final Exam.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Len Jacobson: "GNSS Markets and Applications". Artech House, 2007.	Yes
Recommended Texts	T. E. G. A. (GSA): "GNSS Market Report", 2015. Bernhard Hofmann-Wellenhof, Herbert Lichtenegger, <i>Navigation Satellite</i> Elmar Wasle, "GNSS – Global	Yes

Systems GPS, GLONASS, Galileo, and more". Springer, 2008.

Websites

<https://mathdf.com/dif/>

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.

Prerequisite module	CPE 106	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Upon completion of this course, the student will be able to:
	17. Understanding the basic concepts and structure of computers. 18. Exploring register transfer logic, arithmetic operations, and addressing modes. 19. Learning about memory organization, memory hierarchy design, and instruction execution stages. 20. Understanding micro operations, hardwired control, micro programmed control, and computer arithmetic operations. 21. Learning about parallel processing, pipelining, and Multi-processor concepts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	5. Enabling the student to understand the basic concepts and structure of computers, including computer organization, processor principles. 6. Enabling the student to analyze the behavior of the main components of a computer system.

	- Enabling the student to manage the computer memory and memory hierarchy. - Enabling the student to understand the solutions of problems related to modern processor cores, including instruction routing, pipelining, and performance optimization. - Enabling the student to learn about parallel processing, multi-processor systems, and GPUs.
Indicative Contents المحتويات الإرشادية	- Overview about digital computer system architecture(3 hrs), - Register transfer language; Bus and memory transfers(3 hrs), - Arithmetic micro-operations and Logic micro-operations(3 hrs), - Basic computer organization and design(3 hrs), - Micro-programmed control memory; Control memory(3 hrs), - Central processing unit. General register organization(3 hrs), - Fundamentals of parallel processing(3 hrs), - Pipelining: Basic and Intermediate Concepts(3 hrs), - Instruction pipeline. RISC Pipeline(3 hrs), - Memory Hierarchy Design(3 hrs), - Cache performance optimization(3 hrs), - Virtual memory(3 hrs), - Multiprocessors and Thread-Level Parallelism(3 hrs), - Cache Coherence in Multiprocessor systems(3 hrs), - Basic of SIMD Processors and GPUs(3 hrs),

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, homework's and examples. Practical examples helps students to understand the course material.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	102	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.8
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	20% (10)	6 and 14	LO #1 to #4
	Assignments	2	10% (5)	4, 7 and 10	LO #1, #2 and #5
	Class Work	2	10% (5)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 to #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview about digital computer system architecture.
Week 2	Register transfer language; Bus and memory transfers.
Week 3	Arithmetic micro-operations and Logic micro-operations.
Week 4	Basic computer organization and design.
Week 5	Micro-programmed control memory; Control memory.
Week 6	Central processing unit. General register organization.
Week 7	Fundamentals of parallel processing
Week 8	Pipelining: Basic and Intermediate Concepts
Week 9	Instruction pipeline. RISC Pipeline
Week 10	Memory Hierarchy Design
Week 11	Cache performance optimization
Week 12	Virtual memory
Week 13	Multiprocessors and Thread-Level Parallelism
Week 14	Cache Coherence in Multiprocessor systems
Week 15	Basic of SIMD Processors and GPUs
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	

Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Morries Mano, Computer System Architecture, 3rd edition, 1993 - John L. Hennessy and David A. Patterson, Morgan Kaufmann, Computer Architecture: A Quantitative Approach, 5th Edition, 2011, ISBN: 9780123838728.	Yes
Recommended Texts	- J.L. Hennessy and D.A. Patterson. Computer Architecture: A Quantitative Approach, 5th Edition, Morgan Kaufmann, 2012. - J.P. Shen and M.H. Lipasti, Modern Processor Design: Fundamentals of Superscalar Processors. McGraw-Hill Higher Education, 2004. (Chapter 5 in course packet) - Bryant, Randal E. and O'Hallaron, David R., Computer Systems: A Programmer's Perspective, 2nd Edition Prentice Hall, 2011. - A.B. Downey. Think Python: How to Think Like a Computer Scientist, version 2.0.13. O'Reilly, 2014. C. Fletcher, EECS150: Interfaces FIFO (a.k.a Ready/Valid). UC Berkeley, 2009.	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 Information

معلومات المادة الدراسية

Module Title	<u>Computer Architecture</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 207</u>				
ECTS Credits	<u>6</u>				
SWL (hr/sem)	150				
Module Level		2	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Ahmed Salah Hameed		e-mail	ahmedhameed_eng@uodiyala.edu.iq	
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		PhD
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		02/06/2024	Version Number		1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CPE 106	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Upon completion of this course, the student will be able to: - Understanding the basic concepts and structure of computers. - Exploring register transfer logic, arithmetic operations, and addressing modes. - Learning about memory organization, memory hierarchy design, and instruction execution stages. - Understanding micro operations, hardwired control, micro programmed control, and computer arithmetic operations. - Learning about parallel processing, pipelining, and Multi-processor concepts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Enabling the student to understand the basic concepts and structure of computers, including computer organization, processor principles. - Enabling the student to analyze the behavior of the main components of a computer system. - Enabling the student to manage the computer memory and memory hierarchy. - Enabling the student to understand the solutions of problems related to modern processor cores, including instruction routing, pipelining, and performance optimization. - Enabling the student to learn about parallel processing, multi-processor systems, and GPUs.
Indicative Contents المحتويات الإرشادية	- Overview about digital computer system architecture(3 hrs), - Register transfer language; Bus and memory transfers(3 hrs), - Arithmetic micro-operations and Logic micro-operations(3 hrs), - Basic computer organization and design(3 hrs), - Micro-programmed control memory; Control memory(3 hrs), - Central processing unit. General register organization(3 hrs), - Fundamentals of parallel processing(3 hrs), - Pipelining: Basic and Intermediate Concepts(3 hrs), - Instruction pipeline. RISC Pipeline(3 hrs), - Memory Hierarchy Design(3 hrs), - Cache performance optimization(3 hrs), - Virtual memory(3 hrs), - Multiprocessors and Thread-Level Parallelism(3 hrs), - Cache Coherence in Multiprocessor systems(3 hrs), - Basic of SIMD Processors and GPUs(3 hrs),

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	102	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	6 and 14	LO #1 to #4
	Assignments	2	10% (5)	4, 7 and 10	LO #1, #2 and #5
	Class Work	2	10% (5)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 to #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview about digital computer system architecture.
Week 2	Register transfer language; Bus and memory transfers.
Week 3	Arithmetic micro-operations and Logic micro-operations.

Week 4	Basic computer organization and design.
Week 5	Micro-programmed control memory; Control memory.
Week 6	Central processing unit. General register organization.
Week 7	Fundamentals of parallel processing
Week 8	Pipelining: Basic and Intermediate Concepts
Week 9	Instruction pipeline. RISC Pipeline
Week 10	Memory Hierarchy Design
Week 11	Cache performance optimization
Week 12	Virtual memory
Week 13	Multiprocessors and Thread-Level Parallelism
Week 14	Cache Coherence in Multiprocessor systems
Week 15	Basic of SIMD Processors and GPUs
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Morries Mano, Computer System Architecture, • 3rd edition, 1993	Yes

	John L. Hennessy and David A. Patterson, Morgan Kaufmann, Computer Architecture: A Quantitative Approach, 5th Edition, 2011, ISBN: 9780123838728.	
Recommended Texts	- J.L. Hennessy and D.A. Patterson. Computer Architecture: A Quantitative Approach, 5th Edition, Morgan Kaufmann, 2012. - J.P. Shen and M.H. Lipasti, Modern Processor Design: Fundamentals of Superscalar Processors. McGraw-Hill Higher Education, 2004. (Chapter 5 in course packet) - Bryant, Randal E. and O'Hallaron, David R., Computer Systems: A Programmer's Perspective, 2nd Edition Prentice Hall, 2011. - A.B. Downey. Think Python: How to Think Like a Computer Scientist, version 2.0.13. O'Reilly, 2014. C. Fletcher, EECS150: Interfaces FIFO (a.k.a Ready/Valid). UC Berkeley, 2009.	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 Information		
معلومات المادة الدراسية		
Module Title	<u>Object Oriented Programming</u>	Module Delivery
Module Type	<u>Core</u>	☒ Theory

Module Code	<u>CPE 208</u>			☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
ECTS Credits	<u>6</u>				
SWL (hr/sem)	150				
Module Level		2	Semester of Delivery		4
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Dhafer Taha Shihab		e-mail	dhafershihab@uodiyala.edu.iq	
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		MSc
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		02/06/2024	Version Number		1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CPE 102	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Upon completion of this course, the student will be able to: 12. To learn basic constructs of programming language that are implementing tools for object oriented program development. 13. To provide the knowledge of Object Oriented Programming Paradigm. 14. To learn object-oriented programming and what distinguishes it from other types of programming methods. 15. To develop skill to analyze and code for problem solution in object oriented approach.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon Completion this Course, the students will able to: 1. Understand used language constructs. 2. Analyze and code the solution to problem using object oriented paradigm, and create class hierarchies using the object-oriented design process. 3. Design and implement programs for complex problems, making good use of the features of the language such as classes, inheritance and templates. 4. Apply object model for software development

Indicative Contents

المحتويات الإرشادية

- Object Oriented Concepts, Merits of Object Oriented Technology. Abstraction, Encapsulation, Information Hiding.(2 hrs)
- Object Model: definition, State, behavior, Identity and messages. Concept of object initialization, constructors, constructor overloading. Name space and references(2 hrs)
- Access modifiers: Class attributes and methods. Introduction to object model of software development. (2 hrs)
- Used Language features: syntax, data types, data type conversions, control statements, operators and their precedence. (2 hrs)
- Introduction to Class: Instance members and member functions. (2 hrs)
- String Handling, Wrapper classes: Arrays and Vectors. (2 hrs)
- Class relationships: Inheritance and its types, Merits and Demerits. (2 hrs)
- Polymorphism: Dynamic method dispatch, Runtime polymorphism, Abstract classes, Interfaces and Packages. (2 hrs)
- Exceptions: Need for exceptions, Checked Vs Unchecked exceptions, creating custom exceptions. (2 hrs)
- Multithreading: Introduction, Priorities and scheduling, Inter-thread communication, Thread Synchronization and its life cycle. (2 hrs)
- Basic concept of streams I/O stream & reader-writer classes. (2 hrs)
- File handling. Applet and its Life Cycle, Templates. (2 hrs)
- Basic GUI elements , Event Delegation Model and event handling. (2 hrs)
- Practical Examples. (4 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
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	20% (10)	7 and 14	LO #2 and #4
	Assignments	2	10% (5)	11 and 13	LO #3 and #4
	Projects / Lab.	1	10% (10)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Object Oriented Programming: Object Oriented Concepts, Merits of Object Oriented Technology. Abstraction, Encapsulation, Information Hiding.
Week 2	Object Model: definition, State, behavior, Identity and messages. Concept of object initialization, constructors, constructor overloading. Name space and references
Week 3	Introduction to Used Language classes and objects: Access modifiers: Class attributes and methods. Introduction to object model of software development.
Week 4	Used Language features: syntax, data types, data type conversions, control statements, operators and their precedence.
Week 5	Introduction to Class: Instance members and member functions.
Week 6	String Handling, Wrapper classes: Arrays and Vectors.
Week 7	Inheritance and Polymorphism : Class relationships: Inheritance and its types, Merits and Demerits.
Week 8	Polymorphism: Dynamic method dispatch, Runtime polymorphism, Abstract classes, Interfaces and Packages.
Week 9	Exception Handling and Multithreading: Exceptions: Need for exceptions, Checked Vs Unchecked exceptions, creating custom exceptions.
Week 10	Multithreading: Introduction, Priorities and scheduling, Inter-thread communication, Thread Synchronization and its life cycle.
Week 11	Used Language I/O, Applets and Event Handling: Basic concept of streams I/O stream & reader-writer classes.
Week 12	File handling. Applet and its Life Cycle, Templates
Week 13	Basic GUI elements , Event Delegation Model and event handling
Week 14	Practical Examples
Week 15	Practical Examples
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Experiments to understand program development environment for Used language.
Week 2	Writing program to learn basic language constructs like identifier, variables, data types and console input/output..

Week 3	Writing program to use class and objects to model problem domain entity in program domain.
Week 4	Writing program to learn control statements.
Week 5	Writing program to learn the Instance members and method
Week 6	Writing program to learn String, Wrapper classes, Array and vectors.
Week 7	Writing program to use inheritance and polymorphism features. Abstract classes and Interfaces
Week 8	Writing program to use inheritance and polymorphism features. Abstract classes and Interfaces(cont.)
Week 9	Programs to use exception and understanding modeling errant condition in execution as class and objects.
Week 10	Experiments to learn Multi-Thread execution.
Week 11	Experiments to understand stream concept and study various stream abstractions and implementation available in the language
Week 12	Writing program to learn File handling, Temples
Week 13	Exploring GUI components and understanding Event Delegation Model. Understanding (GUI) objects and their communication based program to realize object oriented programming in action.
Week 14	Understanding (GUI) objects and their communication based program to realize object oriented programming in action. (cont.)
Week 15	Projects

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Danny Poo , Derek Kiong , Swarnalatha Ashok, Object-Oriented Programming and Java - Robert Lafore , Object-Oriented Programming in C++, , Fourth Edition	No
Recommended Texts	- Dusty Phillips, Python 3 Object-oriented Programming - Third Edition. - Timothy Budd, An Introduction to Object-Oriented Programming - Prof. Choudhary, Beniwal, Dadheech and KLSI, Object Oriented Programming	No
Websites	■	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance

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

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

Module Information

معلومات المادة الدراسية

Module Title	Microprocessor			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CPE 210				
ECTS Credits	<u>5</u>				
SWL (hr/sem)	125				
Module Level		2	Semester of Delivery		4
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Royida Alhayali		e-mail	royida.alhayali@uodiyala.edu.iq	
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		Master
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Maather A. Ibrahim	e-mail	dr.maatheralshaibi_eng@uodiyala.edu.iq	
Scientific Committee Approval Date		02/06/2024	Version Number		1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Semester
Co-requisites module	None
	Semester

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives

أهداف المادة الدراسية

Upon completion of this course, the student will be able to:

27. Understand Microprocessor architecture and pin configuration.
28. Learn the Interface technique between microprocessors and Memory.
29. Learn the interface technique between microprocessors and I/O.
30. Learn the addressing modes of microprocessors.
31. Learn different types of controllers that are used in the interface.
32. Develop executable programs by using assembly language instructions.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

16. Demonstrated the various features of the 8086 processor, memory, and I/O devices including the system bus.
17. Identify the hardware elements of the 8086 microprocessor including architecture and pin functions and programming model including registers, instruction sets, and addressing modes.
18. Create assembly language programs for the 8086 processor.
19. Apply the tools debug, TASM/ MASM.
20. Build and analyze assembly programs that depend on the interface such as traffic lights, LED displays, and timers.
21. Understand the function and use of interrupts in microprocessor systems.
22. Design a given interfacing system using concepts of memory and I/O interfacing.

Indicative Contents

المحتويات الإرشادية

- Internal Architecture and Features of 8086 Microprocessor (3 hrs),
- Addressing Modes of 8086 (3 hrs),
- Intel 8086 Instruction Set: Data Movement Instructions, Logical and Arithmetic Instructions, Rotate and Shift Instructions (3 hrs),
- Intel 8086 Instruction Set: Conditions and Loops, Array and Table Processing, String Instructions (3 hrs),
- Intel 8086 Instruction Set: Interrupt instructions, Procedures (3 hrs),
- Pin Configuration of 8086 Microprocessors, Minimum and Maximum modes of 8086, Clock Generator (8284A), Bus Buffering and Latching, Bus Timing (3 hrs),
- Memory Interfacing: Memory Devices, Memory Address Decoding Using NAND and Decoder (3 hrs),
- I/O Interfacing: Memory Mapped, I/O Mapped, Address Decoding using NAND and Decoder (3 hrs),
- I/O Interfacing: I/O instructions and Data Transfer (3 hrs),
- Intel 8086 Interfacing with 8255 PPI: Introduction to PPI, PPI Structure (3 hrs),
- Intel 8086 Interfacing with 8255 PPI: Operation, and Programming of 8255 PPI (3 hrs),
- Interrupt Processing in 8086: Interrupt Pin, Interrupt Vector Table and It's Organization (3 hrs),
- Interrupt Processing in 8086: Software and hardware Interrupt, Interrupt Priorities (3 hrs),
- A/D and D/A interface, Keyboard and Display Interface (3 hrs)
- DMA (3 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.1
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	20% (10)	7 and 14	LO #2 and #5
	Assignments	2	10% (5)	11 and 13	LO #4 and #5
	Projects / Lab.	1	10% (10)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Internal Architecture and Features of 8086 Microprocessor
Week 2	Addressing Modes of 8086
Week 3	Intel 8086 Instruction Set: Data Movement Instructions, Logical and Arithmetic Instructions, Rotate and Shift Instructions
Week 4	Conditions and Loops, Array and Table Processing, String Instructions
Week 5	Interrupt instructions, Procedures
Week 6	Pin Configuration of 8086 Microprocessors, Minimum and Maximum modes of 8086, Clock Generator (8284A), Bus Buffering and Latching, Bus Timing
Week 7	Memory Interfacing: Memory Devices , Memory Address Decoding Using NAND and Decoder
Week 8	I/O Interfacing : Memory Mapped, I/O Mapped, Address Decoding using NAND and Decoder
Week 9	I/O Interfacing: I/O instructions and Data Transfer

Week 10	Intel 8086 Interfacing with 8255 PPI: Introduction to PPI, PPI Structure
Week 11	Intel 8086 Interfacing with 8255 PPI: Operation, and Programming of 8255 PPI
Week 12	Interrupt Processing in 8086: Interrupt Pin, Interrupt Vector Table and It's Organization
Week 13	Interrupt Processing in 8086: Software and hardware Interrupt, Interrupt Priorities
Week 14	A/D and D/A interface, Keyboard and Display Interface
Week 15	DMA
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Computer Assembly and Parts Characteristics
Week 2	Introduction to 8086 kit and software simulation
Week 3	Programs involving data transfer instructions
Week 4	Programs involving arithmetic operation instructions like Addition and subtraction of numbers
Week 5	Programs involving the logic operation
Week 6	Code conversion
Week 7	Programs involving multiplication and division
Week 8	Programs involving bit manipulation instruction
Week 9	Programs involving shift and rotate instructions
Week 10	Programs involving branch \loop operation instructions
Week 11	Programs involving string instructions
Week 12	Arithmetic programs to find square, cube, LCM, GCD and factorial
Week 13	Program involving I/O ports
Week 14	Procedures
Week 15	Practical Examples

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	B.Brey, "The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, and Pentium Pro processor Architecture, Programming, and Interfacing", 6th Edition, Prentic-Hall Inc., 2003	Yes
Recommended Texts	Michael B. Karbo., "PC Architecture. Preface", Denmark, Europe, 2005.	No

	- Kevin James, "PC Interfacing and Data Acquisition: Techniques for Measurement, Instrumentation and Control", Newnes, 2000. - Solari E., Willse G.: "PCI Hardware and Software", Annabooks, 1996. - Shanley T., Anderson D.: "PCI System Architecture", Addison-Wesley, 1998.	
Websites	■	

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

Module Information					
معلومات المادة الدراسية					
Module Title	Database Systems		Module Delivery		
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Practical ☐ Seminar		
Module Code	CPE 209				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		2	Semester of Delivery		4
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Yasser Abdulhaleem Abdulkareem		e-mail	yasser_almadani@uodiyala.edu.iq	
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		MSc.

Module Tutor	Yasser Abdulhaleem Abdulkareem	e-mail	yasser_almadani@uodiyala.edu.iq
Peer Reviewer Name	Shaimaa khamees Ahmed Sabah A. AbdulKareem	e-mail	shaimaa_khamees@uodiyala.edu.iq sbh_anwar@uodiyala.edu.iq
Scientific Committee Approval Date	02/06/2024	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	Upon completion of this course, the student will be able to understand: 33. The Database system and application. 34. The Purpose of the database system. 35. About Characteristics and Benefits of a Database. 36. About Database Architecture. 37. About Database language languages. 38. About the Data Dictionary. 39. Types of DBMS. 40. The Relational databases. 41. About Database Design.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	7. Describe the fundamental elements of relational database management systems. 8. Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL. 9. Design ER-models to represent simple database application scenarios. 10. Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data. 11. Improve the database design by normalization.

Indicative Contents

المحتويات الإرشادية

- Introduction to Database systems (2 hrs.),
- Database Users, Roles and Database administration (2 hrs.),
- Database Architectures and the Web (2 hrs.),
- Introduction to Structured Query Language (SQL) (2 hrs.),
- The SQL SELECT statement and Table Joins (2 hrs.),
- Advanced SQL SELECT (2 hrs.),
- SQL programming: stored procedures functions (2 hrs.),
- Relational Algebra & SQL (2 hrs.),
- Database analysis and data modeling (2 hrs.),
- Using High-Level Conceptual Data Models for Database Design (2 hrs.),
- Logical database design, mapping complex data models (2 hrs.),
- Logical database design and normalization (2 hrs.),
- Physical database design (2 hrs.),
- Course projects (4 hrs.).

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	63	Structured SWL (h/w)	4.2
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	4.1
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem)	125		
الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	7 and 14	LO #2 and #5
	Assignments	2	10% (5)	11 and 13	LO #4 and #5

	Projects / Lab.	1	10% (10)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #3
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Database systems.
Week 2	Database Users, Roles and Database administration.
Week 3	Database Architectures and the Web.
Week 4	Introduction to Structured Query Language (SQL).
Week 5	The SQL SELECT statement and Table Joins.
Week 6	Advanced SQL SELECT. 6.1 Aggregates. 6.2 Sub-selects. 6.3 Views.
Week 7	SQL programming: stored procedures functions.
Week 8	Relational Algebra & SQL.
Week 9	Database analysis and data modeling.
Week 10	Using High-Level Conceptual Data Models for Database Design.
Week 11	Logical database design, mapping complex data models.
Week 12	Logical database design and normalization.
Week 13	Physical database design.
Week 14	Course projects..
Week 15	Midterm Exam.
Week 16	Preparatory week before the final Exam.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to databases management system. 1. Functions of a database. 2. Terminology. 3. Popular DBMS. 4. Uses in business and industry.
Week 2	Installing MySQL to manipulate with database.
Week 3	Installing Python and PyCharm (IDE) to manipulate with database.

Week 4	Getting started with MySQL: 1. Opening the database. 2. Application window. 3. Menu bar. 4. Status bar. 5. Toolbar. 6. Dialog box.
Week 5	Creating a database by using SQL statements: 1. Designing the database. 2. Creating a table structure. 3. Adding records.
Week 6	Editing a database by using SQL statements: 1. Modifying the table structure. 2. Adding or deleting records. 3. Inserting or deleting fields.
Week 7	Retrieving Information by using SQL statements: 1. Using Queries. 2. Querying multiple tables.
Week 8	Presenting the data: 1. Designing reports. 2. Creating reports.
Week 9	Advanced SQL Operators: 1. SQL like operator. 2. SQL Wildcard. 3. SQL IN operator. 4. SQL BETWEEN operator.
Week 10	SQL Joins: 1. INNER JOIN. 2. LEFT OUTER JOIN. 3. RIGHT OUTER JOIN. 4. FULL OUTER JOIN.
Week 11	SQL Constraints 1. NOT NULL 2. UNIQUE 3. PRIMARY KEY 4. FOREIGN KEY 5. CHECK 6. DEFAULT 7. INDEX
Week 12	SQL aggregate functions.
Week 13	SQL String functions.
Week 14	MySQL date functions.
Week 15	lab. Projects.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of Database Systems, 6th Edition, Ramez Elmasri and Shamkant B. Navathe.	Yes

Recommended Texts	SQL Learn Basics of Queries and Implement Easily, James Jackson.	No
Websites	https://www.coursera.org/courses?query=database%20management	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	English Language 2		Module Delivery	
Module Type	Basic learning activities		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UD21			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level		UGII	Semester of Delivery	
Administering Department		All	College	All
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	3/11/2024	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	The module aims at enabling students to learn and understand the written and spoken form of English. It also aims at teaching functional English to learners and honing their reading, writing and listening skills>
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Read and understand simple texts in English. 2. Answer simple comprehension questions and match sentences about texts. 3. Reconstruct texts by reordering sentences. 4. Understand the main idea of a text. 5. Identify specific information in a text. Writing and paraphrasing paragraphs.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. i) Grammar has a core place in language teaching and learning. ii) A wide variety of practice tasks in all the four skills are essential to language learning. iii) Everyday expressions, particularly of spoken English, also need a place in the syllabus. These can be functional, social, situational or idiomatic.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

Headway's trusted methodology combines solid grammar and practice, vocabulary development, and integrated skills with communicative role-plays and personalization.

Authentic material from a variety of sources enables students to see new language in context, and a range of comprehension tasks, language and vocabulary exercises, and extension activities practice the four skills. 'Everyday English' and 'Spoken grammar' sections practice real-world speaking skills, and a writing section for each unit at the back of the book provides models for students to analyze and imitate.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
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	4	20% (5)	3 , 6,8,11	LO #1...#3, #4...#6, #7, #9... #11
	Assignments	2	10% (5)	5 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	2hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Course Introduction (Course material and objectives, learning outcomes, lessons and assessment discussed with the learners).
Week 2	Unit 1. Getting to know you Reading: People, the great communicators' - the many ways we communicate Listening: Neighbours - Steve and Mrs Snell talk about each other as neighbours Speaking: Information gap - Joy Darling Writing: Informal letters - A letter to a pen friend Grammar: Tenses: present, past and future
Week 3	Unit 2. The way we live Reading: 'Living in the USA' - three people talk about their experiences Listening: You drive me mad (but I love you)! - what annoys you about the people in your life? Speaking: Information gap - people's Lifestyles. Exchanging information about immigrants to the USA Writing: Linking words, but, however. Describing a person Grammar: Present tense , present continuous
Week 4	Unit 3. It all went wrong Reading: 'The burglars' friend'. Newspaper stories. A short story - 'The perfect crime Listening: A radio drama - 'The perfect crime Speaking: Information gap - Zoe's party. Telling stories Writing: Linking words: while, during, and for. Writing a story Grammar: Past tenses: Past Simple and past continuous
Week 5	Unit 4. Let's go shopping! Reading: 'The best shopping street in the world' Listening: 'My uncle's a shopkeeper' , Buying things Speaking: Town survey - the good things and bad things about living in your town, Discussion - attitudes to shopping p Writing: Filling in forms Grammar: Quantity , Articles
Week 6	Assessment Test 1. Feedback and Remedial Work

Week 7	Unit 5. What do you want to do? Reading: 'Hollywood kids - growing up in Los Angeles ain't easy' Listening: A song - You've got a friend Speaking: What are your plans and ambitions? Being a teenager Writing: Writing a postcard Grammar: Verb patterns 1, future intentions
Week 8	Unit 6. Tell me! What's it like? Reading: A tale of two millionaires' - one was mean and one was generous Listening: Living in another country — an interview with a girl who went to live in Sweden Speaking: Information gap – comparing cities Writing: Relative clauses 1 who/that/which/where. Describing a place Grammar: Comparative and superlative adjectives big, bigger, biggest, good, better, best
Week 9	Unit 7. Famous couples Reading: Celebrity interview from Hi! Magazine with the pop star and the footballer who are in love Listening: An interview with the band Style Speaking: Mingle - Find someone who ... Role play - interviewing a band Writing: Relative clauses 2 who/ which/ that as the object. Writing a biography Grammar: Present Perfect and Past Simple
Week 10	Unit 8. Do's and don'ts Reading: Problems and suggestions Listening: Holidays in January - three people's advice on what to do in their country in January Speaking: Jobs - a game. Discussion - house rules, Asking questions about place Writing: Writing letters- Formal letters Grammar: have (got) to, should, must
Week 11	Assessment Test 2. Feedback and Remedial Work
Week 12	Unit 9. Going places Reading: The world's first megalopolis - a city of 40 million people Listening: Life in 2050 - an interview with Michio Kaku, Professor of Theoretical Physics Speaking: What will you do? Discussion - what will life be like in the 21st century? Writing: Linking words 2, Advantages and disadvantages Grammar: Time and conditional clauses
Week 13	Unit 10. Scared to death Reading: 'Don't look down' - walking on a dangerous footpath, 'Into the wild' Listening: When I was young p80 It was just a joke - a boy called Jamie kidnapped his friend Speaking: 'When I was young' - talking about your childhood Writing: Writing letters Formal and informal letters 1 Grammar: Verb patterns 2 manage to do, used to do, go walking, Infinitives, Purpose
Week 14	Unit 11. Things that changed the world Reading: Three plants that changed the world - tobacco, sugar and cotton Listening: The world's most common habit: chewing gum Speaking: Exchanging information about three plants Writing: Writing a review of a book or film Grammar: Passive
Week 15	Unit 12. Dreams and reality Reading: The vicar who's a ghostbuster Listening: An interview with a woman who heard voices Speaking: Giving advice - If I were you, I'd..... Writing: Writing letters Expressions in different kinds of letters Grammar: Second conditional

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Material Covered

Week 1

Week 2

Week 3

Week 4

Learning and Teaching Resources

مصادر التعلم والتدريس

Text

Available in the Library?

Required Texts

New Headway Pre-Intermediate by: John and Liz Soars.
Oxford University Press

Yes

Recommended Texts

None

Websites

<https://apoyanblog.wordpress.com/wp-content/uploads/2016/09/new-headway-preintermediate-students-book.pdf>

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
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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 العربية 2			Module Delivery	
Module Type	Basic learning activities			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	UD22				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		UGII	Semester of Delivery		
Administering Department		All	College	All	
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		3/11/2024	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

الهدف الاساسي في تدريس الطالب يالس اللغوية العربية في الة لالائق الساكر بالمعل ،
موية رالك ه يقينا ان التعبري القرا

ين تعبري في ن مقصود
، كل لفظة ، وكل حرف وضع وضعافنيا مقصوداً

- تقويم اللسان العربي . واعتماد العربية الفصحى في الحديث والكتابة ، ولزيادة رصيد الطالب من ادب وتراث ، على تناول النصوص المختارة من العصور الأدبية المختلفة ، لزيادة رصيد ادب ليات والادب المعاصر .

- التأكيد على دور الطالب في المتابعة واثراء المعرفة باللغة العربية وفنونها بجهد خاص ، ذا امالي ومضبعاناد رم افلا تميحرفالمة انلهوا جس اعلة را. يس لتقع على الطالب بعد ذلك مهمة فتح الأبواب والنوافذ في جعل العربية الفصيحة تحتل موضع الصدارة وتجاوز العامية ، خدمة الى لغتنا العربية المقدسة. وحفاظا على قوتها وجمالها .
- ومن نافلة القول في اهداف تدريس اللغة العربية : يه الجانب المحقق للوحدة وتلزمنا دوافع الوفاء بالحرص عليها والمحافظة على جوهرها .

Module Objectives

أهداف المادة الدراسية

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	يمكن ايجاز مخرجات العلم لمادة اللغة العربية العامة لاقسام غري الاختصاص بالنسبة لمرحلة الدراسة الأولى بالاسي :- * علمه اليق ري بان القران الكريم قد اعطى للغة قيمة عليا ، وم يلة رفيعة . واجبه الحفاظ عليها وصيانتها من اللحن والخطا ، ومن كل ما يشوبها . * تمك ري الطالب من قراءة النص القراي بنفسه وتمكنه من معرفة ما ي ف الايات الكريمة من امور لغوية وبلاغية ومعنوية ، وتمكنه من فحصها فحصاً دقيقاً . * سيتمكن الطالب من معرفة ما ي ف لغته العربية من دقة ي ف التعبري واحكام ي ف الفن والعلو ي ف الصنعة . * إظهار القواعد العلمية ، والأسس الفنية ، ال ي ن يقوم عليها العمل الأد ين ي ف جزئياته وكلياته . لبيان الروح الجمالية والإبداعية ال ي ن تتجلى ي ف النص الأد ين . * فهم طبيعة اللغة من حيث اعرابها (علم النحو) ، من الفعل والفاعل الذي يقع عليه فعل الفاعل ، والحال والتمير ي والاوجه الاعرابية لما بعد التمر ي . * تمك ري الطالب من التفريق ب ري الافعال الثلاثية والرابعة والخماسية ، وتمكينه من التمر ي ب ري الافعال ومصادر الافعال ، فالفعل : لفظ يدل على حدث الى جانب دلالته على الزمن ، مصدره لا يدل على زمنه أي زمن فعله . * التعريف بالمفهوم الزم ين الف ين : للحدث والمعاصرة ي ف الأدب ، وإعطاء صورة لتطور أدب وصولاً إلى أدب العصر الحديث . * معرفة الطالب لمفهوم الن ي العرين ، وكيفية تطور الن ي من القديم وكيفية تطور من القديم الى العصر الحديث من: المقالة والقصة والمسرحية ، ومعرفة اهم خصائصه الفنية ، وتطور المصطلح من الن ي الى مفهوم السرد ي ف العصر الحديث . * تعريف الطالب بمفهوم الشعر الحر او " شعر التفعيلة " ورواد مدرسة الشعر الحر ، نازك الملائكة وبدر شاكر السياب ، وكيف تفجرت حركة الشعر كلون من الوان الاحتجاج على الواقع الف ين العرين .
Indicative Contents المحتويات الإرشادية	1- الاهتمام بالكلام ، ومحاولة التعمق ي ف دراسة قواعده واصوله وتاريخه . 2- الاهتمام بقواعد اللغة تاصيلًا وتقعيدًا ، وتاريخ ادبها تسجيلًا وتدوينًا ، ونقد نصوصها تفسيرًا وتاويلًا .

- 3- الفهم الدقيق لاصوات اللغة العربية ، ومعرفة مخارج الاصوات ، ومعرفة مخرج كل صوت من اصوات العربية بطريقة مبسطة .وعلاقة الدال بالمدلول .
- 4- البحث ي ف نشأة اللغة ، وعلاقتها بغريها ، وخصائص اصواتها ، وابنية مفرداتها وتراكيبها .
- 5- البحث ي ف عناصر لهجاتها وتطور دلالاتها ، والعوامل الـ يـ ن اثرت فيها ، والقوان ري الـ يـ ن تحكم الصلة ب ري الفاظها .
- 6- الاهتمام بالكلام ومحاولة التعمق ي ف دراسة قواعده واصوله وتاريخه .
- 7- توليد القدرة على تذوق النصوص ، وفتح نافذة القدرة على التحليل والتاويل ، ومعرفة ما يريد ان يقوله النص الادين .
- 8- دراسة اساسيات النحو العرين وقواعد الجملة العربية .
- 9- التعرف على تراكيب الجملة الفعلية والاسمية والمركبة .

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

- ليحقق التدريسي س اهداف ونواتج التعلم المستهدفة لا بد من تحقيق الـ يـ ن :
- ١_ الـ يـ كـ ري على اسـ لـ يـ اتـ يـ جـ يـ ات تقود الى التعلم النشط ، والتأكيد على دور المتعلم واثارة اهتمامه ودفعه الى المشاركة الايجابية
 - ٢_ الاكثار من النصوص العربية العالية
 - ٣_ وان نعد بعض القطع للقراءة يـ مـ لـ يـ جـ فيها درس القواعد بدرس الادب؛ فان ذلك ادعى لتنمية ذوق الطالب ي ف الفهم والحس والكلمات والاساليب واستعمالها .
 - ٤_ منح التدريسي س حرية اختيار قطع للقراءة من كتب الادب والنصوص ومن ادب المناسبات الذي ينـ لـ سـ ري ف الصحف والمجلات ، لتصحيح النطق عند الطالب ، وتعويده على القراءة الصحيحة الخالية من اللحن .
 - ٥_ تقع على عاتق التدريسي س مهنة اساسية و يـ هـ التشويق والتقويم والتصويب ي ف تدريسه اللغة _ العربية العامة لأقسام غري اختصاص .
 - ٦_ تنشيط عنصر الـ يـ لـ يـ از باللغة العربية لدى طالب العلم وتأصيله والعمل على زرع محبته للغة العربية بوصفها اللغة الام لغة القرآن الكريم لغة الاعجاز والبيان . من خلال عرضه لقصص تراثية تتعلق بحرص العرين على لغته والـ يـ لـ يـ از بها .

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (5)	3 , 5,8,11	LO #1...#3, #4...#5, #7, #9... #11
	Assignments	2	10% (5)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO #1 - #7
	Final Exam	2hr	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المناهج الأسبوعية النظري	
	Material Covered
Week 1	(الفصل الأول (مهارات التعبير وفن الإنشاء و مهارات التعبير : (1) كتابة الإنشاء.
Week 2	(2) كتابة الخاطرة و المقالة.
Week 3	(الفصل الثاني (من القواعد الصرفية : (3) الأفعال الثلاثية و الرباعية و الخماسية و السداسية.
Week 4	(4) من مصادر الأفعال.
Week 5	(الفصل الثالث (القواعد النحوية : (5) الفاعل ، و نائب الفاعل.
Week 6	(6) الأفعال الناقصة (كان و أخواتها.
Week 7	(7) الأحرف المشبهة بالفعل (إنَّ و أخواتها .
Week 8	(8) من أنواع المفاعيل (المفعول به + المفعول المطلق + ظرفا الزمان و المكان .
Week 9	(9) الحال ، و التمييز ، و الاستثناء.

Week 10	(10 من أنواع التوابع :) النعت و التوكيد.)
Week 11	(11 قواعد كتابة العدد.)
Week 12	(الفصل الرابع (الأدب العربي :) 12 (نصوص من الشعر الحديث) محمد مهدي الجواهري (.)
Week 13	(13 (نصوص من الشعر الحر) أ (بدر شاكر السياب (.)
Week 14	(14 (ب (نازك الملائكة.)
Week 15	(15 (من فنون النثر الحديث) الرواية و المسرحية (.)

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	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- التعبير ألقراي ن - الدكتور : فاضل السامري 2- شح ابن عقيل على الفية ابن مالك - لابن عقيل 3- علم اساليب البيان - غازي يموت . 4- اللغة العربية لاقسام غري الاختصاص مجموعة من اساتذة اللغة العربية .	
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 (فقد المعالجة)	(45-)94	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
المرحلة الثالثة / الفصل الأول

Semester 5

No.	Module Code	Module Name in English
1	CPE 301	Engineering Analysis
2	CPE 303	Signals and Systems
3	CPE 305	Digital System Design
4	CPE 306	Control Theory
4	CPE 309	Data Communication and Networking
6	CPE 308	Operating Systems

Semester 6

No.	Module Code	Module Name in English
1	CPE 302	Numerical Analysis
2	CPE 304	Digital Signal Processing
3	CPE 307	Statistics and Probability
5	CPE 310	Web Design
5	CPE 311	Artificial Intelligence
6	CPE 312	Digital Image Processing



Module Information

معلومات المادة الدراسية

Module Title	<u>Engineering Analysis</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 301</u>				
ECTS Credits	<u>5</u>				
SWL (hr/sem)	<u>125</u>				
Module Level		3	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Raghda Salam Ali		e-mail	raghdasalam@uodiyala.edu.iq	
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		MSc.
Module Tutor	Raghda Salam Ali		e-mail	raghdasalam@uodiyala.edu.iq	
Peer Reviewer Name		Sabah Anwer	e-mail	Sabah anwer@uodiyala.edu.iq	
Scientific Committee Approval Date		20/11/2024	Version Number		1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CPE 202	Semester	4
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives	Upon completion of this course, the student will be able to understand: 1. Mathematics develops the mind to think in a logical and critical manner, hence enhancing the capacity to methodically tackle and resolve issues.
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	- Mathematics enables individuals to comprehend and articulate patterns, connections, and structures seen in the natural world, ranging from planetary orbits to musical rhythms. - Developing Analytical Skills: Engaging in the study of mathematics improves one's ability to think analytically, enabling individuals to deconstruct intricate situations into more manageable components and comprehend the fundamental laws that govern them.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- The student learns the types of Power Series Solutions of D.Es (Ordinary Points and Frobenius Method) - The student learns the application of Differential equations and the Z-Transform . - Know the ordinary equation, its types, applications, and Partial Differential Equations (PDEs) - Understand the Complex Variables, (Limit and Continuity Analytic Functions - Cauchy and Their Riemman) and Gama, Beta, and Bessel's Functions. - Enabling the student to Elementary Complex Functions, Exponential, Logarithm, Trigonometric, Hyperbolic, and their Inverse. - The student learns Integration In Complex Plan
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - The student learns an introduction to the engineering analysis and its principles (3 hrs) - Power Series Solutions of D.Es (6 hrs) - Frobenius Method application of Differential equations (3 hrs) - The Z-Transform (6 hrs) - Complex Variables (Limit and Continuity) (6 hrs) - Analytic Functions(3 hrs) - Cauchy and Their Riemman) (3 hrs) - Gama, Beta, and Bessel's Functions (3 hrs) - Elementary Complex Functions, Exponential, Logarithm (3 hrs) - Trigonometric, Hyperbolic, Their Inverse (3 hrs) - Residues And Residue Theorem and Inverse Evaluation of Z-T using Residue Principle (6 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, homework's and examples. Practical examples help students to understand the course material.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	6 and 12	LO #1 to #4 and #6 to #8
	Assignments	2	10% (5)	4, 7 and 10	LO #2, #3, #4, #5 and #7, #8, #9
	Classwork	2	10% (5)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the engineering analysis
Week 2	Applications of Differential Equations
Week 3	Power Series Solutions of D.Es



Week 4	Frobenius Method
Week 5	Heat equation, wave equation
Week 6	Gama, Beta
Week 7	Bessel's Functions and Bessel's equations
Week 8	The Z-Transform
Week 9	The inverse Z-Transform and application
Week 10	Complex Variables,(Limit and Continuity)
Week 11	Integration In Complex Plan
Week 12	Elementary Complex Functions
Week 13	Analytic Functions
Week 14	Cauchy and Their Riemman
Week 15	Residues And Residue Theorem
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Erwin Kreyszig, Herbert Kreyszig, Edward J. Norminton "Advanced Engineering Mathematics", tenth Edition, 2011	Yes
Recommended Texts	Robert Wrede, Ph.D. and Murray R. Spiegel, Ph.D." Advanced Calculus" Third Edition, 2010	No

	- Kenneth Stroud, Advanced Engineering Mathematics, 5th Edition K. F. Riley, Mathematical-Methods for Physics & Engineering-Comprehensive Guide, 3th Edition. - Murray Spiegel, Schaum's Outline of Fourier Analysis with Applications - Any other materials available on the web.	
Websites	https://math.mit.edu/~gs/books/itam.html	

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

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Signal and System</u>			Module Delivery
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>CPE 303</u>			
ECTS Credits	<u>5</u>			
SWL (hr/sem)	<u>125</u>			
Module Level		3	Semester of Delivery	
Administering Department		Computer Eng.	College	College of Engineering
Module Leader	Warqaa Shaher Saleh		e-mail	Warqaa.sh@uodiyala.edu.iq



Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc
Module Tutor	Sara Hussien Muhi	e-mail	sara.muhi@uodiyala.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	20/11/2024	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	53. The student learns the types of signals and the properties of each type. 54. The student learns operations on signals and the classification of signals. 55. The student learns the Sampling Theorem, time domain Analysis, and Discrete Time system 56. The student learns the LTI system, System response, and system classification. 57. The student learns Convolution, Deconvolution, Autocorrelation, and Cross correlation 58. The student learns the Discrete and Fast Fourier Transform DFT, IDFT, and FFT
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Understand the signals and their properties, being able to classify the signal and its operations. - Learn the classification of the system and its Properties. - Understand and analyze the time domain of continuous and discrete Time Systems. - Learn the sampling theorem. - Understand the convolution, deconvolution, and correlation (auto and cross-correlation) - Learn the LTI system, and system response (impulse and unit) - Learn Continuous Time Fourier Series - Understand and analyze Discrete Fourier Transform (DFT) and Inverse Discrete Fourier Transform (IDFT). - Learn Discrete Time Fourier Transform (DTFT) and its Properties. - Understand Fast Fourier Transform(FFT)
Indicative Contents	Indicative content includes the following.



المحتويات الإرشادية	• Overview of signals and its properties ;(3 hrs) • Signal classifications and Operations; (4 hrs) • System Classification and Properties; (3 hrs) • Time Domain Analysis of Continuous Time System; (3 hrs) • Sampling Theorem, Nyquist Theorem, Aliasing; (2 hrs) • Time Domain Analysis of discrete Time Systems;(3 hrs) • Convolution, Deconvolution & Correlation (Auto and Cross-correlation) ;(6 hrs) • LTI system, System Response(impulse and unit) ;(4 hrs) • Continuous Time Fourier Series; (2 hrs) • Discrete Fourier Transform(DFT) & Inverse Discrete Fourier Transform(IDFT);(6 hrs) • Discrete Time Fourier Transform (DTFT) & Properties of Discrete Time Fourier Transform (DTFT); (6 hrs) • Fast Fourier Transform(FFT) ;(3 hrs)
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, homework's and examples. Practical examples helps students to understand the course material.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		



Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	6 and 12	LO #1 to #4 and #6 to #8
	Assignments	2	10% (5)	4, 7 and 10	LO #2, #3, #4, #5 and #7, #8, #9
	Class work	2	10% (5)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview of signals and their properties
Week 2	Signal Classifications and Operations
Week 3	System Classification and Properties
Week 4	Time Domain Analysis of Continuous Time System
Week 5	Sampling Theorem, Nyquist Theorem, Aliasing
Week 6	Time Domain Analysis of Discrete Time Systems.
Week 7	Convolution, Deconvolution
Week 8	Correlation (Auto and Cross-correlation)
Week 9	LTI system, System Response(impulse and unit)
Week 10	Continuous Time Fourier Series
Week 11	Discrete Fourier Transform (DFT).
Week 12	Inverse Discrete Fourier Transform (IDFT).
Week 13	Discrete-Time Fourier Transform (DTFT).
Week 14	Properties of Discrete Time Fourier Transform (DTFT).



Week 15	Fast Fourier Transform(FFT)
Week 16	Preparatory week before the Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thanos and Don Johnson, Signals and Systems, Rice University, Houston, Texas 2008	No
Recommended Texts	B. A. Sheno, <i>Introduction to Digital Signal processing and filter Design</i>, Wiley-Inter science, 2006 - Lathi, <i>Signal Processing and Linear Systems</i>, 1998. - Paul A. Lynn: <i>Introductory Digital Signal Processing with Computer Applications</i>, 1998 - Any other materials available on the web.	No
Websites	< http://cnx.org/content/col10064/1.11/ >	

Grading Scheme

مخطط الدرجات

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



	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Module Information					
معلومات المادة الدراسية					
Module Title	<u>Digital System Design</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 305</u>				
ECTS Credits	<u>5</u>				
SWL (hr/sem)	<u>125</u>				
Module Level		3	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Maather A. Ibrahim		e-mail	Dr.maatheralshaibi_eng@uodiyala.edu.iq	
Module Leader’s Acad. Title		Lecture	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	CPE 204	Semester	3
Co-requisites module	None	Semester	



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	59. The student understands the digital system design. 60. The student understands complex programmable logic devices CPLD and field programmable gate arrays FPGA. 61. The student understands the concept of sequential circuits. 62. The student analyzes and synthesizes synchronous sequential circuits in the Mealy and Moore models. 63. The student understands the state reduction. 64. The student understands sequential circuits with a programmable logic device. 65. The student understands new methods to design synchronous sequential circuits. 66. The student understands the algorithmic state machine ASM. 67. The student understands finite state machines for data path and control units. 68. The student understands a synchronous sequential circuit.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	11. Understand the fundamental concepts used in the design of digital systems. 12. Learn the operation and architecture of CPLD and FPGA. 13. Design and analyze combinational and sequential circuits. 14. Understand how synchronous sequential circuits work. 15. Understand the finite state machine and its design principles. 16. Understand the approaches to design synchronous sequential finite state machines. 17. Understand the approaches used for state reduction. 18. Understand essential concepts of important applications of sequential circuits that contain programmable logic devices. 19. Understand new approaches to designing synchronous sequential circuits. 20. Understand the principles of data transfer and control unit. 21. Understand the design and build of control units and data transfer using finite state machines. 22. Understand the approaches to design asynchronous sequential finite state machines. 23. Understand hardware description language (HDL). 24. Develop, test, and debug a digital system using hardware descriptive language(HDL).
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction: overview of digital system design; (3 hrs.) • Complex programmable logic device (CPLD): construction, operation (3 hrs.) • Field programmable gate (FPGA): construction, operation (3 hrs.) • Synchronous sequential circuits: analysis and design of synchronous sequential circuit state and logic diagrams, Synthesis procedure of synchronous sequential circuit, simplification of synchronous sequential circuit by using state reduction, operation of synchronous sequential circuits with programmable logic devices; (15 hrs.) • New method to design synchronous sequential circuit;(3 hrs.) • Algorithmic Finite State Machin; (3 hrs.) • Data path and control units: Finite state machine for data path and control unit; (6 hrs.) • Asynchronous sequential circuits: pules and fundamental modes for asynchronous sequential circuits; (6 hrs.)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

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

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	6 and 12	LO #1 to #4 and #6 to #8
	Assignments	2	10% (5)	4, 7 and 10	LO #2, #3, #4, #5 and #7, #8, #9
	Class work	2	10% (5)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

**Delivery Plan (Weekly Syllabus)**

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to digital system design
Week 2	Complex Programmable Logic Design (CPLD)
Week 3	Field Programmable Gate Array (FPGA)
Week 4	Introduction to Sequential Logic Circuit
Week 5	Analysis and Synthesis of Synchronous Sequential Circuit using finite state machine (Mealy Model)
Week 6	Analysis and Synthesis of Synchronous Sequential Circuit using finite state machine (Moore Model)
Week 7	Simplification of Synchronous Sequential Circuit
Week 8	Sequential Circuit with Programmable Logic Device
Week 9	Design of Synchronous Sequential Circuit Using New Methods
Week 10	Algorithmic State Machine (ASM)
Week 11	Finite State Machine for Data Path Unit
Week 12	Finite State Machine for Control Unit
Week 13	A Synchronous Sequential Circuit – Introduction-
Week 14	Pulse Mode A Synchronous Sequential Circuits-
Week 15	Fundamental-mode A Synchronous Sequential Circuits-
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Design logic gate in HDL
Week 2	Addition in HDL (Half adder, Full adder)
Week 3	Modeling combinational logic in HDL (Multiplexer, Decoder)
Week 4	Design look-up table
Week 5	Modeling sequential logic using HDL (D flip flop, J-K flip flop)
Week 6	Design PLD using HDL (PROM , PAL,PLA)
Week 7	Finite state machine synchronous (Moore model)
Week 8	Finite state machine synchronous (Mealy model)
Week 9	Design algorithmic state machine A.S.M



Week 10	Design data path unit
Week 11	Design control unit
Week 12	Design counter-based microprogrammed FSM
Week 13	Design micro sequencer
Week 14	Design pulse mode asynchronous sequential circuits
Week 15	Design fundamental mode asynchronous sequential circuits
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Nelson, <i>Digital Logic Circuit Analysis and Design</i>, 2010.	Yes
Recommended Texts	- Enoch O. Hwang, <i>Digital Logic and Microprocessor Design</i>, La Sierra University, Riverside, 2010. - Rabaey, J. M., <i>Digital Integrated Circuit-A design Perspective</i>, 2010 - J.Bhasker, <i>Verilog HDL Synthesis, A Practical Primer</i>, 2007. - Stephen D. Brown & Zvonko G. Vranesic, <i>Fundamentals of digital logic with VHDL design</i>, 2009. - Shoab Ahmed Khan, <i>Digital Design of Signal Processing Systems</i>, 2011.	No
Websites	https://www.youtube.com/watch?v=IqLUUifutFg&list=PL4sLc6Jg6MwOdx0v41Om6N6lWMMp1Ynnl	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance



(50 - 100)	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
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	F – Fail	راسب	(0-44)	Considerable amount of work required

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Module Information

معلومات المادة الدراسية

Module Title	<u>Control Theory</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 306</u>				
ECTS Credits	<u>5</u>				
SWL (hr/sem)	<u>125</u>				
Module Level		3	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Saad Abdulmaged Salman		e-mail	drsaad_eng@uodiyala.edu.iq	
Module Leader’s Acad. Title		Assistant Professor	Module Leader’s Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/12/2024	Version Number		1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CPE 202	Semester	4
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Co-requisites module	None	Semester	
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Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	69. During the semester, the student learns the basics of control theory. 70. Understanding the basics of analog control systems. 71. Learn how to think about determining the stability of analog control systems. 72. The student learns the concepts of embedded design for analog control systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	25. Understand the basic definitions and transfer function. 26. Learn and analyze the mathematical representation of control systems. 27. Learn and solve the state-space representation of dynamic systems. 28. Learn the block diagram reduction and signal flow graph. 29. Learn and analyze time-domain analysis of the control system. 30. Learn the biasing of stability for control systems. 31. Understand the principles of root-locus and learn to plot it. 32. Understand and analyze the frequency response. 33. Understand the principles of polar plot and learn the Nyquist stability criterion. 34. Understand the principles of the bode diagram and learn to plot it. 35. Learn the types of compensators. 36. Understand the design of the control system compensator by root locus method.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction: Basic Definitions and Transfer function (3 hrs) • Mathematical Representation of Control Systems (3 hrs) • State-Space Representation of Dynamic System (6 hrs) • Block Diagram reduction and Signal Flow Graph (6 hrs) • Time-Domain Analysis of Control System (6 hrs) • Stability of Control System (3 hrs) • Root-Locus Analysis (6 hrs) • Frequency Response Analysis (6 hrs) • Control System Design by the Root-Locus Method (6 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, homework's and examples. Practical examples helps students to understand the course material.
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**Student Workload (SWL)**

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.1
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% (5)	6 and 12	LO #1 to #4 and #5 to #7
	Assignments	5	10% (2)	4, 7, 9, 11 and 13	LO #3, #4, #5, #6, #7, and #10
	Classwork	2	10% (5)		
	Projects / Lab.	1	10% (1)		
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #6
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Basic Definitions and Transfer function
Week 2	Mathematical Representation of Control Systems: Mechanical and Electrical systems
Week 3	State-Space Representation of Dynamic System: Approach and Concept



Week 4	State-Space Representation of Dynamic System: Solution
Week 5	Block Diagram reduction
Week 6	Signal Flow Graph
Week 7	Time-Domain Analysis of Control System: Transient response analysis and Definitions of transient response specification
Week 8	Time-Domain Analysis of Control System: Steady-state error analysis
Week 9	Stability of Control System: Complex plane, Poles and zeros, Characteristic equation, Routh's stability criterion.
Week 10	Root-Locus Analysis: construction
Week 11	Root-Locus Analysis: plots
Week 12	Frequency Response Analysis: Polar plot (Nyquist plot) and Nyquist stability criterion.
Week 13	Frequency Response Analysis: Bode diagram plot.
Week 14	Control System Design by the Root-Locus Method: Lead, Lag, and Lead-lag compensations.
Week 15	Control System Design by the Root-Locus Method: Lead, Lag, and Lead-lag compensations.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Types of Special Signals: Unit step function and Unit impulse function
Week 2	Transfer Function: Open loop system
Week 3	Transfer Function: Closed loop system
Week 4	State space
Week 5	Block Diagram Reduction: Series
Week 6	Block Diagram Reduction: Parallel
Week 7	Response of First Order System



Week 8	Response of Second Order System
Week 9	Time Domain Analysis of Control System
Week 10	Stability of System by Root Locus Method: Part A
Week 11	Stability of System by Root Locus Method: Part B
Week 12	Frequency Response Analysis: Polar Plot and Nyquist stability criterion
Week 13	Frequency Response Analysis: Bode diagrams
Week 14	Compensator Designed by Frequency Response: Lead compensator
Week 15	Compensator Designed by Frequency Response: Lag compensator

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Katsuhiko Ogata , " <i>Modern Control Engineering</i> ", Fifth edition, Prentice Hall, 2010	Yes
Recommended Texts	- Chi-Tsong Chen , " <i>Analog And Digital Control System Design</i> ", Saunders College Publishing, 2005. - John J. D'Azzo, Constantine H. Houpis " <i>Linear Control System Analysis and Design with MATLAB</i> ", fifth edition, Marcel Dekker Inc., 2003.	No
Websites	https://www.youtube.com/channel/UCzJj25XWtDX4eGrHB9ljk1Q?view_as=subscriber	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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Module Information

معلومات المادة الدراسية

Module Title	<u>Operating Systems</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 308</u>				
ECTS Credits	<u>5</u>				
SWL (hr/sem)	<u>125</u>				
Module Level		3	Semester of Delivery		5
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Ali N. Albu-Rghaif		e-mail	ali.alburghaif@uodiyala.edu.iq	
Module Leader’s Acad. Title		Asst. Professor	Module Leader’s Qualification		Ph.D.
Module Tutor	Shaimaa Khamees Ahmed		e-mail	shaimaa_khamees@uodiyala.edu.iq	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		19/11/2024	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	73. Understand the core functions and architecture of operating systems. 74. Explain and analyze process management, scheduling, and synchronization. 75. Describe memory management techniques and file system organization. 76. Develop and troubleshoot OS-level process, memory, and file management code.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learn the core concepts of operating systems and their roles in managing hardware and software resources. 2. Understand how operating systems handle process creation, termination, and inter-process communication. 3. Compare processes and threads and explain the benefits of multithreading. 4. Understand the goals of CPU scheduling and its impact on system performance. 5. Understand the characterization of the Deadlock and the methods for handling. 6. Learn the functions and challenges of memory management in operating systems. 7. Realize the structure and components of file systems. 8. Describe the role of I/O systems and device drivers in operating systems.
Indicative Contents المحتويات الإرشادية	(3 hrs) Introduction to Operating Systems ○ Overview of operating system functions and architecture ○ Types of operating systems (batch, time-sharing, real-time, distributed) ○ History and evolution of operating systems 3 hrs)) System Structure and OS Services ○ System calls and OS structure (monolithic, microkernel) ○ User mode vs. kernel mode ○ OS services and API concepts 3 hrs)) Processes and Process Management ○ Process concept, process state, and process control block (PCB) ○ Context switching and process scheduling ○ Introduction to multi-programming and multitasking Threads and Concurrency (3 hrs) ○ Difference between processes and threads ○ Thread management, advantages of threads ○ Concurrency and parallelism basics Process Synchronization (3 hrs) ○ Critical section problem and solutions ○ Synchronization tools: mutexes, semaphores, monitors ○ Classic synchronization problems (producer-consumer, readers-writers) CPU Scheduling (6 hrs) ○ CPU scheduling algorithms (FCFS, SJF, Priority, Round Robin) ○ Multiprocessor scheduling ○ Performance evaluation of scheduling algorithms Deadlocks (6 hrs) ○ Deadlock characterization and conditions ○ Methods for handling deadlocks (prevention, avoidance, detection, recovery) ○ Resource allocation graphs and Banker's Algorithm Memory Management (6 hrs) ○ Basic memory management, partitioning, and fragmentation ○ Paging and segmentation ○ Virtual memory and page replacement algorithms Virtual Memory Management (3 hrs) ○ Demand paging and page replacement policies (FIFO, LRU, Optimal)



	○ Thrashing and memory allocation strategies ○ Working set model File Systems (3 hrs) ○ File concepts and attributes, directory structures ○ File system mounting, sharing, and protection ○ Disk scheduling and allocation methods I/O Systems (3 hrs) ○ I/O hardware and interfacing with the OS ○ I/O buffering, caching, and spooling ○ Device drivers and interrupt handling
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Lecture-Based Teaching • Purpose: To introduce foundational concepts and provide a theoretical understanding. • Example: Explain CPU scheduling algorithms or memory management concepts using lectures. • Enhancements: ○ Include multimedia like diagrams, animations, and short videos to visualize complex processes. ○ Use storytelling (e.g., real-world examples of deadlocks like traffic jams) to make abstract concepts relatable.
	Problem-Based Learning (PBL) • Purpose: Engage students in solving real-world problems to deepen understanding. • Examples: ○ Assign a project to detect and handle deadlocks in a simulated environment. ○ Challenge students to optimize memory allocation strategies for a hypothetical OS.
	Group Activities and Discussions • Purpose: Foster collaboration and peer learning. • Examples: ○ Organize group discussions to compare CPU scheduling algorithms and debate their pros/cons. ○ Assign case studies where students analyze and present on the architecture of distributed operating systems.
	Flipped Classroom • Purpose: Allow students to learn basic concepts at home and focus on problem-solving in class. • Implementation: ○ Share pre-recorded lectures or curated videos on topics like process management. ○ Use class time for coding exercises, Q&A, or group challenges.
	Continuous Assessment • Purpose: Reinforce learning through regular feedback. • Examples: ○ Weekly quizzes on topics like threads, concurrency, and deadlocks. ○ Short coding assignments to implement concepts learned in lectures.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	6 and 12	LO #1 to #4 and #6 to #8
	Assignments	2	10% (5)	4, 7 and 10	LO #2, #3, #4, #5 and #7, #8, #9
	Classwork	2	10% (5)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Operating Systems
Week 2	System Structure and OS Services
Week 3	Processes and Process Management
Week 4	Threads and Concurrency
Week 5	Process Synchronization
Week 6	CPU Scheduling Concept
Week 7	CPU Scheduling Algorithms



Week 8	Deadlocks Concept
Week 9	Deadlocks Methods
Week 10	Midterm Review and Exam
Week 11	Memory Management Concept
Week 12	Memory Management Algorithms
Week 13	Virtual Memory Management
Week 14	File Systems
Week 15	I/O Systems
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Silberschatz, Galvin, and Gagne, "Operating System Concepts", 9th edition, 2013.	No



Recommended Texts	- Andrew S. Tanenbaum, "Modern Operating Systems", 5th edition, 2022 - Deitel, Deitel and Choffnes, "Operating Systems", 3rd ed., Prentice Hall, 2004.	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 Information

معلومات المادة الدراسية

Module Title	<u>Data Communication and Networking</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 309</u>				
ECTS Credits	<u>5</u>				
SWL (hr/sem)	125				
Module Level		3	Semester of Delivery		6
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Ahmed Mahmood Jasim		e-mail	ahmed.1985m@uodiyala.edu.iq	
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		Ph.D.
Module Tutor	Ghassan Khazal Ali		e-mail	ghassan_khazal@uodiyala.edu.iq	



Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	Understand the Fundamentals of Data Communications - Define data Communications, explain its importance, and describe the key components and Communications types (simplex, half-duplex, full-duplex). - Understand the concepts of frequency, spectrum, and bandwidth. Differentiate Between Data and Signals - Distinguish between data and signals. - Compare analog and digital signals and explain their characteristics (amplitude, frequency, phase). - Understand bit rate vs. baud rate. Identify Transmission Impairments and Understand Channel Capacity - Recognize types of noise affecting Communications systems (thermal, crosstalk, impulse). - Explain the significance of Signal-to-Noise Ratio (SNR). - Apply Nyquist and Shannon formulas to determine channel capacity. Explain Digital Transmission Techniques - Describe methods of digital-to-digital and analog-to-digital conversion. - Understand the need for synchronization in digital transmission. Understand Analog Transmission and Modulation Methods - Explain analog modulation techniques (AM, FM, PM). - Identify digital-to-analog modulation schemes: ASK, FSK, PSK, and QAM. Explore Multiplexing and Switching Techniques
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	○ Differentiate between TDM, FDM, and WDM. ○ Understand circuit, packet, and message switching methods. ○ Analyze the concepts of delay, loss, and throughput in packet-switched networks. 7- Describe the Basics of Computer Networks ○ Define computer networks and their applications. ○ Identify network types (LAN, WAN, MAN) and topologies (bus, ring, star, mesh, hybrid). ○ Recognize the role of standards organizations like ISO, IEEE, ITU, and IETF. 8- Understand Protocol Layering and Network Models ○ Explain the concept of protocol layering. ○ Identify the functions of the TCP/IP suite and the OSI model. ○ Describe the encapsulation and decapsulation processes. 9- Identify Key Network Devices and Their Roles ○ Describe the functions of routers, switches, hubs, and bridges. ○ Distinguish between collision and broadcast domains. 10- Analyze Physical Layer Concepts and Transmission Media ○ Compare guided and unguided transmission media. ○ Evaluate media performance in terms of attenuation, noise, and bandwidth. ○ Understand relevant physical layer transmission standards. 11- Understand Data Link Layer Functions ○ Explain the services of the data link layer, including framing and addressing. ○ Identify and apply error detection and correction methods (e.g., parity, CRC). ○ Describe flow control mechanisms. 12- Explore Current Trends and Applications in Data Communications ○ Understand basic concepts in IoT Communications and wireless technologies (Wi-Fi, Bluetooth). ○ Gain awareness of emerging trends such as optical networks and 5G.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of this module, students will be able to: 1- Describe the fundamental concepts and components of data Communications systems, including the role of protocols and types of transmission (simplex, half-duplex, full-duplex). 2- Differentiate between analog and digital signals, and explain their characteristics and transmission methods, including encoding and modulation. 3- Explain common transmission impairments and apply basic formulas (e.g., Nyquist, Shannon) to evaluate channel capacity. 4- Apply appropriate techniques for signal conversion, synchronization, and multiplexing, including TDM, FDM, and WDM. 5- Analyze switching techniques (circuit, packet, and message) and their impact on performance metrics like delay and throughput. 6- Describe the functions and structure of the OSI and TCP/IP models, including the concept of layering, encapsulation, and protocol functions. 7- Identify basic network devices and explain their roles within collision and broadcast domains. 8- Identify and compare various transmission media, both guided and unguided, in terms of performance factors such as bandwidth, attenuation, and noise. 9- Demonstrate understanding of error detection and correction methods, including parity checks, checksums, and CRC. 10- Recognize emerging technologies and trends in data Communications, such as IoT, wireless Communications (Wi-Fi, Bluetooth), and 5G.



Indicative Contents

المحتويات الإرشادية

- 1- Introduction to Data Communications (3 hrs.)**
 - Definition and importance
 - Components of data Communications systems
 - Role of protocols in Communications
 - Frequency, Spectrum, and Bandwidth
 - Types of data Communications: simplex, half-duplex, full-duplex
- 2- Data and Signals (3 hrs.)**
 - Data vs. signals
 - Analog and digital signals
 - Signal characteristics: amplitude, frequency, phase
 - Bit rate vs. baud rate
- 3- Transmission Impairments and Channel Capacity (3 hrs.)**
 - Types of noise: thermal, crosstalk, impulse
 - Signal-to-noise ratio (SNR)
 - Nyquist and Shannon capacity formulas
- 4- Digital Transmission Techniques (3 hrs.)**
 - Signal conversion: digital-to-digital, analog-to-digital
 - Synchronization methods
- 5- Analog Transmission and Modulation (3 hrs.)**
 - Amplitude, frequency, and phase modulation (AM, FM, PM)
 - Digital-to-analog conversion: ASK, FSK, PSK, QAM
- 6- Multiplexing and Switching (3 hrs.)**
 - Time Division Multiplexing (TDM), Frequency Division Multiplexing (FDM), Wavelength Division Multiplexing (WDM)
 - Circuit switching, packet switching, message switching
 - Delay, loss and Throughput in Packet-Switched Networks
- 7- Introduction to Computer Networks (3 hrs.)**
 - Definitions and uses of Computer Networks.
 - Types of networks (LAN, WAN, MAN) and topologies.
 - Topologies: bus, ring, star, mesh, hybrid
 - Standards organizations: ISO, ITU, IETF, IEEE
- 8- Protocol Layering and Models (6 hrs.)**
 - Protocol layering concept
 - TCP/IP protocol suite
 - OSI model (brief overview and limitations)
 - Encapsulation and decapsulation
- 9- Network Devices (3 hrs.)**
 - Devices: routers, switches, hubs, bridges
 - Collision domain vs. Broadcast domain.
- 10- Physical Layer Concepts (6 hrs.)**
 - Transmission Media (Guided and Unguided media)
 - Media performance: attenuation, noise, bandwidth
 - Physical layer transmission standards
- 11- Data Link Layer Concepts (6 hrs.)**
 - Data Link layer services
 - Framing and addressing
 - Error Detection and Correction
 - Flow Control Protocols
- 12- Current Trends and Applications (Optional) (3 hrs.)**
 - IoT Communications basics
 - Wireless Communications overview (Wi-Fi, Bluetooth)
 - Emerging topics (optical networks, 5G basics)



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

1- Lectures and Interactive Discussions

- Description: Use lectures to introduce foundational concepts such as signals, transmission media, encoding techniques, and network models.
- Strategy: Integrate real-world analogies and interactive Q&A to promote student engagement and concept retention.
- Tools: PowerPoint slides, whiteboard explanations, and educational videos demonstrating signal types and transmission processes.

2- Problem-Based Learning (PBL)

- Description: Assign foundational problems requiring analysis and structured thinking.
- Example: Choose the best transmission medium and encoding scheme for a rural data link or simulate CRC error detection for a given data stream.
- Objective: Develop analytical and problem-solving skills while applying theoretical knowledge.

3- Collaborative Projects

- Description: Group assignments to design or simulate basic Communications scenarios.
- Example: Design a simple Communications system for a home network, illustrating the choice of media, encoding, and error control methods.
- Objective: Build teamwork, basic research, and technical explanation skills.

4- Flipped Classroom Approach

- Description: Share pre-class resources covering introductory material (e.g., videos on analog vs. digital signals).
- Strategy: Use in-class sessions for deeper discussions, clarification, and worked examples.
- Objective: Promote active learning and help students grasp key concepts more deeply.

5- Formative Assessments and Quizzes

- Description: Conduct regular mini-quizzes and quick feedback activities after key topics (e.g., encoding, multiplexing).
- Strategy: Use clicker tools, online quizzes, or short written exercises to reinforce lessons.
- Objective: Continuously monitor student understanding and address misconceptions early.

6- Mini Project

- Description: Conclude the module with a small-scale individual or group project that integrates key learning points.
- Example: Simulate a basic Communications setup (sender–channel–receiver) including noise and error correction.
- Objective: Encourage synthesis of theoretical and practical knowledge in a simplified real-world context.

7- Peer Teaching and Group Presentations

- Description: Assign students to explain basic concepts (e.g., modulation types or OSI layers) to peers.
- Objective: Deepen understanding through teaching and improve presentation and Communications skills.



	8- Demonstrations and Industry Examples ○ Description: Show real-time examples such as data transmission with and without noise, or physical cable types. ○ Strategy: Bring in hardware like coaxial/fiber cables or show live signal tracing. ○ Objective: Bridge theory and practice using tactile and visual examples.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5 each)	6 and 12	LO #1 to #3 and #4 to #6
	Home Works	2	10% (5 each)	5 and 10	All
	Class Participation	Continuous	10% (10)	Ongoing	All
	Assignment	1	10% (10)	15	All
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #5
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Data Communications.
Week 2	Data and Signals.
Week 3	Transmission Impairments and Channel Capacity.
Week 4	Digital Transmission Techniques.
Week 5	Analog Transmission and Modulation.
Week 6	Multiplexing and Switching.



Week 7	Introduction to Computer Networks.
Week 8-9	Protocol Layering and Models
Week 10	Network Devices
Week 11-12	Physical Layer Concepts.
Week 13-14	Data Link Layer Concepts.
Week 15	Current Trends and Applications (Optional)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Behrouz A. Forouzan, Data Communications and Networking, 5th Edition - William Stallings, Data and Computer Communications, 10th Edition	No
Recommended Texts	- Kurose, J.F. and Ross, K.W. (2017) Computer Networking: A Top-Down Approach. 7th edn. Pearson Education. ISBN-10: 1-292-15359-8, ISBN-13: 978-1-292-15359-9 - Tanenbaum, A.S. and Wetherall, D.J. (2014) Computer Networks. 5th edn. Pearson education. ISBN-10: 1-292-02422-4, ISBN-13: 978-1-292-02422-6	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 المرحلة الثالثة / الفصل الثاني

Module Information				
معلومات المادة الدراسية				
Module Title	<u>Numerical Analysis</u>		Module Delivery	
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 302</u>			
ECTS Credits	<u>5</u>			
SWL (hr/sem)	<u>125</u>			
Module Level	3	Semester of Delivery		
Administering Department	Computer Eng.	College	College of Engineering	
Module Leader	Sabah Anwer Abdulkareem	e-mail	Sbh_anwar@uodiyala.edu.iq	
Module Leader's Acad. Title	Lect.	Module Leader's Qualification	MSC	
Module Tutor	Name (if available)	e-mail	E-mail	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	19/11/2024	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	CPE 301	Semester	1

Co-requisites module	None	Semester	
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Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	77. Understand fundamental concepts such as continuity, differentiability, and the role of Taylor series in approximation. 78. Apply interpolation techniques (Lagrange, Newton, Hermite) to approximate functions and solve data fitting problems. 79. Solve ordinary differential equations using various methods (Euler, Runge-Kutta, Predictor-Corrector). 80. Perform error analysis to understand and minimize errors in numerical methods. 81. Analyze stability and convergence in numerical computations. 82. Solve boundary value problems and work with piecewise interpolation techniques such as linear and cubic splines.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	37. Understand and apply the concept of continuity of a function. Prove and use the Intermediate Value Theorem to find roots or values of functions in intervals. 38. Understand the concept of floating-point representation of numbers and its implications for numerical computations. 39. Analyze how small differences in numbers can result in significant errors due to rounding or precision loss. 40. Understand how errors propagate through numerical operations and learn methods to control and minimize errors. 41. Evaluate the stability of numerical algorithms and understand how errors affect the outcome of computations over time. 42. Derive and apply the Lagrange interpolation formula to approximate functions through polynomials. 43. Use Newton's method for polynomial interpolation, including calculating divided differences and constructing the interpolating polynomial. 44. Apply Hermite interpolation for approximating functions that involve both function values and derivatives. 45. Understand and compute the error involved in polynomial interpolation. 46. Apply and compare piecewise linear interpolation with cubic spline interpolation, focusing on their advantages in approximating functions. 47. Use trigonometric interpolation techniques, particularly when dealing with periodic data. 48. Solve problems in data fitting using least-squares approximation to minimize the error between the data and the model. 49. Use the Euler method for approximating the solution of ordinary differential equations (ODEs), understand its limitations and convergence properties. 50. Apply Runge-Kutta methods for more accurate solutions of ODEs and assess their stability and error bounds. 51. Use multi-step methods such as Adams-Bashforth and Adams-Moulton for solving



	ODEs, and analyze their advantages and disadvantages.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction: Overview about P.N Junction; (3 hrs) • Introduction Mathematical Preliminaries and errors (6 hrs.) • The student learns the Linear system and Nonlinear Equations: (8 hrs.) • Learn the details of Lagrange Interpolation; and Differentiation and Integration: (12 hrs.) • The student Learn how Differential Equations (14 hrs.)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, homework's and examples. Practical examples helps students to understand the course material.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.1
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	20% (10)	6 and 12	LO #1 to #4 and #6 to #8
	Assignments	2	10% (5)	4, 7 and 10	LO #2, #3, #4, #5 and #7, #8, #9
	Class work	2	10% (5)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #7
	Final Exam	3 hr	50% (50)	16	All



Total assessment 100% (100 Marks)

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction, Errors, Types of Errors
Week 2	Interpolation, Equal Space Interpolation
Week 3	Network's Form Interpolation, Unequal Space
Week 4	Quadratic Interpolation
Week 5	Solution of Non-Linear Algebraic Equation: Bi-section
Week 6	Linear, Interpolation
Week 7	Newton-Raphson Method, Iterative
Week 8	Numerical Solutions of Linear Systems
Week 9	Numerical Differentiation
Week 10	Numerical Integration: Trapezoidal Rule of Integration, Simpson's Rule of Integration Method(1/3, 3/8)
Week 11	Numerical Integration: Development of Special Integration Formulas, Integration of Unevenly Spaced Base Points, Romberg's Integration, Gauss Quadrature Formulas
Week 12	Ordinary Differential Equations: Euler Method
Week 13	Modified Euler Method
Week 14	Range Kutta Methods
Week 15	Adam's Method
Week 16	Preparatory week before the Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	K. E. Atkinson, An Introduction to Numerical Analysis (2nd edition), Wiley-India, 1989.	Yes
Recommended Texts	2. S. D. Conte and Carl de Boor, Elementary Numerical Analysis - An Algorithmic Approach (3rd edition), McGraw-Hill, 1981.	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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	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 (فيد المعالجة)	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

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

Module Information

معلومات المادة الدراسية

Module Title	<u>Digital Signal Processing</u>	Module Delivery
Module Type	<u>Core</u>	☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	<u>CPE 304</u>	
ECTS Credits	<u>5</u>	
SWL (hr/sem)	<u>125</u>	

Module Level	3	Semester of Delivery	6
Administering Department	Computer Eng.	College	College of Engineering
Module Leader	Warqaa Shaher Saleh	e-mail	Warqaa.sh@uodiyala.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSc.
Module Tutor	Sara Hussien Muhi	e-mail	sara.muhi@uodiyala.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	20/11/2024	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CPE 303	Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	83. The student learns the components of digital signal processing and its properties 84. The student learns the classification of DSP and its applications. 85. The student learns the Digital filters and Analog filters and their functions 86. The student learns types of filters (FIR and IIR filter). 87. The student learns FIR filter design by using the Fourier method and windows methods 88. The student learns the IIR filters and their design by using different methods based on the Z-transform method and analog filters
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	52. Learn the principles of digital signals (unit step, impulses, ramp, exponential, cosine) 53. Understand and analyze the components of Digital signal processing and its properties 54. Learn applications of the DSP system 55. The ability to resolve the equations using Z-Transforms and Inverse Z-Transform. 56. Understand and analyze the functions of digital filters and Analog filters. 57. Understand the classification of Digital filters and Filter structures 58. Learn types of Digital Filters (FIR and IIR) 59. Learn Finite Impulse Response FIR Filter and Infinite Impulse Response of Digital Filter(IIR)



	60. The ability to design FIR filters using the Fourier Transform Method and FIR filters Windows Methods (Hamming, Hanning, Black man and Kaiser Windows) 61. The ability to design (LP, HP. Band pass, and Stop pass FIR filters) 62. The ability to design IIR filter (Pole-Zero placement, Impulse Invariant, Matched Z-Transform, and Bilinear Z-Transform Methods) 63. Understand realization Structures For IIR Digital Filters
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction about digital signals (unit step, impulses, ramp, exponential, cosine) (1hrs) • Components of Digital signal processing and its properties & Applications of DSP system(3hrs) • Z-Transforms and Region of Convergence & Properties of Z-Transformer Inverse Z- Transform (3hrs) • Digital filters and Analog filters and their functions(3hrs) • Classification of Digital filters and Filter structures (3hrs) • Types of Digital Filters (FIR and IIR) (2hrs) • Finite Impulse Response FIR Filter and filter Specifications(2hrs) • Design FIR filter using Fourier Transform Method (6hrs) • Designing FIR filters Windows Methods (Hamming, Hanning, Black man, and Kaiser Windows) (6hrs) • Design (LP, HP.Band pass and Stop pass FIR filters)(6hrs) • Infinite Impulse Response of Digital Filter(IIR) (3hrs) • IIR filter Design (Pole-Zero placement, Impulse Invariant, Matched Z-Transform, and Bilinear Z-transform Methods) (6hrs) • Realization Structures For IIR Digital Filters) (4hrs)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, homework's and examples. Practical examples helps students to understand the course material.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		



Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	6 and 12	LO #1 to #4 and #6 to #8
	Assignments	2	10% (5)	4, 7 and 10	LO #2, #3, #4, #5 and #7, #8, #9
	Class work	2	10% (5)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction about digital signals (unit step, impulses, ramp, exponential, cosine)
Week 2	Components of Digital signal processing and its properties
Week 3	Applications of DSP system
Week 4	Z-Transforms and Region of Convergence
Week 5	Properties of Z-Transformer
Week 6	Inverse Z- Transform
Week 7	Digital filters and Analog filters and their functions
Week 8	Classification of Digital filters and Filter structures
Week 9	Types of Digital Filters(FIR and IIR)
Week 10	Finite Impulse Response FIR Filter and Filter Specifications
Week 11	Design FIR filter using the Fourier Transform Method
Week 12	Designing FIR filters Windows Methods(Hamming, Hanning, Black man, and Kaiser Windows)
Week 13	Design(LP, HP.Band pass, and Stop pass FIR filters)
Week 14	Infinite Impulse Response of Digital Filter(IIR)



Week 15	IIR filter Design (Pole-Zero placement, Impulse Invariant, Matched Z-Transform, and Bilinear Z-Transform Methods)
Week 16	Realization Structures For IIR Digital Filters

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

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

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	B. A. Sheno, <i>Introduction to Digital Signal Processing and Filter Design</i> , Wiley-Inter science, 2006 •	Yes
Recommended Texts	• Tatsuo Higuchi, Masayuki Kawamata, Morikita <i>Digital Signal Processing with Matlab</i> , 2015. • Lonnie C. Ludeman: <i>Fundamentals of Digital Signal Processing</i> , 1991. • Lathi, <i>Signal Processing and Linear Systems</i> , 1998. • Paul A. Lynn: <i>Introductory Digital Signal Processing with Computer Applications</i> , 1998	No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance



(50 - 100)	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 (فيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

Module Information

معلومات المادة الدراسية

Module Title	<u>Statistics and Probability</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 307</u>				
ECTS Credits	<u>5</u>				
SWL (hr/sem)	<u>125</u>				
Module Level		3	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Ali J. Abboud		e-mail	ali.j.abboud@uodiyala.edu.iq	
Module Leader’s Acad. Title		Asst. Professor	Module Leader’s Qualification		Ph.D.
Module Tutor	Saad Q. Albawi		e-mail	saadalbawi@uodiyala.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		19/11/2024	Version Number		1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
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Co-requisites module	None	Semester	
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Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Provide a foundational understanding of statistics and probability, including key concepts such as randomness, probability measures, and finite probability spaces. 2. Explore discrete and continuous random variables, with a focus on binomial, Poisson, exponential, and normal distributions. 3. Develop skills in hypothesis testing, confidence intervals, and inferential statistics to make data-driven decisions. 4. Introduce statistical modeling techniques, including regression analysis, and their applications in prediction. 5. Cover advanced topics such as maximum likelihood estimation (MLE), maximum a priori estimation (MAP), statistical learning, and survival analysis. 6. Equip students with the tools to apply statistical methods to real-world problems, including machine learning and data analysis
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	64. Demonstrate a clear understanding of fundamental statistical and probability concepts, including probability spaces, conditional probability, and Bayes' theorem. 65. Analyze and interpret discrete and continuous random variables, including calculating mean and variance for various distributions. 66. Apply hypothesis testing and confidence intervals to draw conclusions from data. 67. Construct and evaluate statistical models, including linear regression, and use them for prediction. 68. Implement advanced statistical techniques such as MLE, MAP, and regularization in machine learning contexts. 69. Apply statistical methods to solve real-world problems, including multiple testing and survival analysis.
Indicative Contents المحتويات الإرشادية	• Introduction to statistics and its applications. • Basic probability concepts: sample space, events, and probability rules. • Understanding randomness and uncertainty. • Definition of finite probability spaces. • Definition and properties of discrete random variables. • Binomial distribution: properties, mean, and variance. • Statement and proof of the Central Limit Theorem (CLT). • Implications of CLT for the normal distribution.



- Sampling distributions and their role in inferential statistics.
- Applications of MLE and MAP in machine learning.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

1. Deliver weekly lectures to cover theoretical concepts, supported by examples and case studies to illustrate key points.
2. Provide hands-on exercises and assignments to reinforce learning, including problem-solving tasks related to probability, distributions, and statistical inference.
3. Facilitate interactive discussions and group activities to encourage critical thinking and application of statistical concepts.
4. Incorporate the use of statistical software (e.g., R, Python, or SPSS) for data analysis, modeling, and visualization.
5. Use case studies and real-world datasets to demonstrate the application of statistical methods in various fields such as finance, healthcare, and machine learning.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
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Formative assessment	Quizzes	2	20% (10)	6 and 12	LO #1 to #6
	Assignments	2	10% (5)	4, 7 and 10	LO #2 to #6
	Class work	2	10% (5)		
	Report				
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #6
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview of statistics and Probability
Week 2	Randomness, finite probability space, probability measure
Week 3	Events; conditional probability, independence, Bayes' theorem
Week 4	Discrete random variables; binomial and Poisson distributions; concepts of mean and variance
Week 5	Continuous random variables; exponential and normal distribution
Week 6	Probability density functions, calculation of mean and variance
Week 7	Central limit theorem and the implications for the normal distribution
Week 8	Confidence intervals and hypothesis testing
Week 9	Statistical Modeling, prediction and Regression
Week 10	Inferential Statistics
Week 11	Maximum likelihood estimation (MLE) and maximum a priori estimation (MAP) to machine learning problems
Week 12	Statistical learning
Week 13	Linear model selection and regularization
Week 14	Multiple testing
Week 15	Survival analysis
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	



Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Dekking, Frederik Michel, Cornelis Kraaikamp, Hendrik Paul Lopuhaä, and Ludolf Erwin Meester. <i>A Modern Introduction to Probability and Statistics: Understanding why and how</i>. Springer Science & Business Media, 2006. - Bertsekas, Dimitri, and John N. Tsitsiklis. <i>Introduction to probability</i>. Vol. 1. Athena Scientific, 2008. - Holický, Milan. <i>Introduction to probability and statistics for engineers</i>. Springer Science & Business Media, 2013.	Yes
Recommended Texts	- Kinney, John J. <i>Probability: an introduction with statistical applications</i>. John Wiley & Sons, 2014. - Sugiyama, M., 2015. <i>Introduction to statistical machine learning</i>. Morgan Kaufmann. - Tucker, Howard G. <i>An introduction to probability and mathematical statistics</i>. Academic Press, 2014. - Mendenhall, William, Robert J. Beaver, and Barbara M. Beaver. <i>Introduction to probability and statistics</i>. Cengage, 2020.	No
Websites	https://youtube.com/playlist?list=PLo6jdcSSoHsLQGLzFrU6tg3e12IS_GDSZ&feature=shared	

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 (فيد 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.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

9- Lectures and Interactive Discussions

- Description: Use lectures to introduce foundational concepts such as signals, transmission media, encoding techniques, and network models.
- Strategy: Integrate real-world analogies and interactive Q&A to promote student engagement and concept retention.
- Tools: PowerPoint slides, whiteboard explanations, and educational videos demonstrating signal types and transmission processes.

10- Problem-Based Learning (PBL)

- Description: Assign foundational problems requiring analysis and structured thinking.
- Example: Choose the best transmission medium and encoding scheme for a rural data link or simulate CRC error detection for a given data stream.
- Objective: Develop analytical and problem-solving skills while applying theoretical knowledge.

11- Collaborative Projects

- Description: Group assignments to design or simulate basic Communications scenarios.
- Example: Design a simple Communications system for a home network, illustrating the choice of media, encoding, and error control methods.
- Objective: Build teamwork, basic research, and technical explanation skills.

12- Flipped Classroom Approach

- Description: Share pre-class resources covering introductory material (e.g., videos on analog vs. digital signals).
- Strategy: Use in-class sessions for deeper discussions, clarification, and worked examples.
- Objective: Promote active learning and help students grasp key concepts more deeply.

13- Formative Assessments and Quizzes

- Description: Conduct regular mini-quizzes and quick feedback activities after key topics (e.g., encoding, multiplexing).
- Strategy: Use clicker tools, online quizzes, or short written exercises to reinforce lessons.
- Objective: Continuously monitor student understanding and address misconceptions early.



	14- Mini Project ○ Description: Conclude the module with a small-scale individual or group project that integrates key learning points. ○ Example: Simulate a basic Communications setup (sender–channel–receiver) including noise and error correction. ○ Objective: Encourage synthesis of theoretical and practical knowledge in a simplified real-world context. 15- Peer Teaching and Group Presentations ○ Description: Assign students to explain basic concepts (e.g., modulation types or OSI layers) to peers. ○ Objective: Deepen understanding through teaching and improve presentation and Communications skills. 16- Demonstrations and Industry Examples ○ Description: Show real-time examples such as data transmission with and without noise, or physical cable types. ○ Strategy: Bring in hardware like coaxial/fiber cables or show live signal tracing. ○ Objective: Bridge theory and practice using tactile and visual examples.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5 each)	6 and 12	LO #1 to #3 and #4 to #6
	Home Works	2	10% (5 each)	5 and 10	All
	Class Participation	Continuous	10% (10)	Ongoing	All
	Assignment	1	10% (10)	15	All
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #5
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

**Delivery Plan (Weekly Syllabus)**

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Data Communications.
Week 2	Data and Signals.
Week 3	Transmission Impairments and Channel Capacity.
Week 4	Digital Transmission Techniques.
Week 5	Analog Transmission and Modulation.
Week 6	Multiplexing and Switching.
Week 7	Introduction to Computer Networks.
Week 8-9	Protocol Layering and Models
Week 10	Network Devices
Week 11-12	Physical Layer Concepts.
Week 13-14	Data Link Layer Concepts.
Week 15	Current Trends and Applications (Optional)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Behrouz A. Forouzan, Data Communications and Networking, 5th Edition - William Stallings, Data and Computer Communications, 10th Edition	No
Recommended Texts	- Kurose, J.F. and Ross, K.W. (2017) Computer Networking: A Top-Down Approach. 7th edn. Pearson Education. ISBN-10: 1-292-15359-8, ISBN-13: 978-1-292-15359-9 - Tanenbaum, A.S. and Wetherall, D.J. (2014) Computer Networks. 5th edn. Pearson education. ISBN-10: 1-292-02422-4, ISBN-13: 978-1-292-02422-6	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 (فقد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

Module Information

معلومات المادة الدراسية

Module Title	<u>Web Design</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 310</u>				
ECTS Credits	<u>5</u>				
SWL (hr/sem)	<u>125</u>				
Module Level		3	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Ahmed Mahmood Jasim		e-mail	ahmed.1985m@uodiyala.edu.iq	
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number		

Relation with other Modules

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	89. Provide foundational knowledge of web technologies, including the architecture of the Internet and the World Wide Web. 90. Introduce students to core web development languages and tools, including HTML, CSS, JavaScript, PHP, and MySQL. 91. Enable students to design and build interactive, responsive, and standards-compliant websites using client-side and server-side technologies. 92. Develop the ability to manage website structure, styling, dynamic content, and database integration. 93. Teach students the principles of effective web design, including layout, typography, color theory, usability, and accessibility. 94. Equip students with practical skills in using professional web development tools such as Dreamweaver and version control systems. 95. Foster critical thinking, teamwork, and communication skills while emphasizing ethical, social, and professional considerations in web development.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	9. Explain the architecture and components of the Internet and the World Wide Web, including client-server models and protocols. 10. Differentiate between types of web documents and scripting languages (client-side vs. server-side). 11. Develop structured, responsive web pages using HTML and CSS according to modern standards and design principles. 12. Create dynamic web applications using PHP and integrate with MySQL for data storage and retrieval. 13. Apply web design best practices related to layout, typography, color theory, and accessibility. 14. Use web development tools such as Notepad++, or other IDEs for efficient design and development. 15. Demonstrate the ability to work in teams to plan, design, and present complete web projects. 16. Recognize and discuss the ethical, professional, and societal issues related to web design and internet technologies.



	17. Engage in self-directed learning using online resources and current documentation to stay updated with web technologies.
Indicative Contents المحتويات الإرشادية	1- Introduction to the Web and Internet (2 hrs.) - History and evolution of the Internet and the World Wide Web - Web design vs. print design: principles and challenges - Overview of Internet architecture and how websites work 2- Web Documents (2 hrs.) - Types of Web Documents - Client-Side Scripting vs. Server-Side Scripting 3- HTML and Document Structure (6 hrs.) - HTML/XHTML structure, elements, and semantics - Page structuring and use of divs and semantic tags - Creating links, lists, tables, and inserting images 4- CSS for Styling and Layout (4 hrs.) - CSS syntax, selectors, and rule structure - Text styling, colors, and backgrounds - The CSS box model: margins, padding, borders - Layout techniques using float, flexbox, and positioning 5- Client-side Interactivity with JavaScript (4 hrs.) - Introduction to JavaScript syntax and DOM manipulation - Event handling and basic animations - Simple form validation using JavaScript 6- Form Design and Processing (2 hrs.) - Creating and styling forms with HTML and CSS - Input types, labels, placeholders, and validation - Handling form submissions 7- Server-side Programming with PHP (4 hrs.) - Basics of PHP syntax, variables, control structures - Embedding PHP in HTML - Processing form data using PHP 8- Database Connectivity with MySQL (4 hrs.) - Introduction to MySQL: tables, records, and queries - Connecting PHP to MySQL databases - Performing CRUD operations (Create, Read, Update, Delete) 9- Final Project and Portfolio Presentation (2 hrs.) - Students design and develop a complete website using HTML, CSS, JS, and PHP/MySQL - Deliverables: source code, written report, design documentation - Final presentations and peer evaluations (Week 15)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- Lectures and Interactive Discussions Description: Deliver foundational knowledge on web technologies, design principles, and development languages. Strategy: Use real-world examples of websites to spark discussions on usability, design flaws, and accessibility. Tools: Slide presentations, live coding demos, and multimedia examples of good/bad web design. 2- Hands-on Labs and Workshops Description: Conduct regular lab sessions where students build and style web pages, add interactivity, and integrate databases. Strategy: Provide step-by-step tasks with increasing complexity; emphasize coding by hand before introducing visual tools.
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	○ Objective: Reinforce theoretical learning with practical skills in HTML, CSS, JavaScript, PHP, and MySQL.
	3- Project-Based Learning (PBL) ○ Description: Assign open-ended projects that require students to plan, design, and implement complete websites. ○ Example: Develop a portfolio or small business website with dynamic content and responsive design. ○ Objective: Encourage creative problem-solving, planning, and application of integrated web technologies.
	4- Collaborative Group Work ○ Description: Assign team-based projects where students design and build web systems collaboratively. ○ Example: Group develops a themed multi-page website with a unified style guide and shared database. ○ Objective: Foster teamwork, communication, version control use, and shared responsibility.
	5- Flipped Classroom Approach ○ Description: Provide online materials such as video tutorials or readings before class. ○ Strategy: Use class time for live coding, debugging sessions, peer reviews, and design critiques. ○ Objective: Increase student engagement and free up time for deeper problem-solving activities.
	6- Formative Assessments and In-Class Challenges ○ Description: Use quick quizzes, coding exercises, and in-class reviews to gauge progress. ○ Strategy: Encourage peer feedback on design drafts and code snippets. ○ Objective: Provide timely feedback and identify conceptual gaps early.
	7- Project Presentation ○ Description: Students complete and present a fully functional, well-designed website incorporating all course concepts. ○ Example: An e-portfolio or a service-based website with dynamic content and contact form integration. ○ Objective: Demonstrate mastery of web development tools, design thinking, and communication.
	8- Peer Teaching and Design Critiques ○ Description: Have students present their design decisions and critique each other's work in a constructive environment. ○ Objective: Improve communication, receive peer feedback, and refine design thinking.
	9- Demonstrations and Guest Lectures ○ Description: Demonstrate modern web tools, responsive frameworks, or invite professionals to share industry trends. ○ Strategy: Use tools like Chrome DevTools, version control demos, and live site breakdowns. ○ Objective: Bridge the gap between academic learning and current professional practice.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.1



Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125
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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5 each)	6 and 12	LO #1 to #6
	Assignments	2	10% (5 each)	5 and 10	LO #2, #4, #5, #6, #8 and #9
	Class Participation and Lab Work	Continuous	10% (10)	Ongoing	All
	Project	1	10% (10)	15	All
Summative assessment	Midterm Exam	1 hr	10% (10)	9	LO #1 - #5
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to the Web and Internet.
Week 2	Web Documents.
Week 3-5	HTML and Document Structure.
Week 6-7	CSS for Styling and Layout.
Week 8-9	Client-side Interactivity with JavaScript.
Week 10	Form Design and Processing.
Week 11-12	Server-side Programming with PHP.
Week 13-14	Database Connectivity with MySQL.
Week 15	hrs.)2Final Project and Portfolio Presentation (

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	No lab (Introduction to the lab requirements)
Week 2	No Lab (Introduction to the project requirements)



Week 3	Introduction to designing Tools
Week 4	Creating Your First Web Page
Week 5	Adding Links and Images to Web Pages
Week 6-7	Working with Tables and Forms in HTML
Week 8	HTML Page Layout using Divs and Semantic Tags
Week 9	CSS Styling Fundamentals
Week 10	Box Model, Positioning, and Layout Techniques
Week 11	No lab (Project Support)
Week 12	Form Validation using JavaScript
Week 13	PHP Form Handling and Data Processing
Week 14	Application Layer Protocols Connecting PHP with MySQL Database
Week 15	Final Project Presentation.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- HTML and CSS: The Complete Reference, (7th Edition) by Thomas A. Powell. - Learning PHP, MySQL & JavaScript: With jQuery, CSS & HTML5, (5th Edition) by Robin Nixon.	No
Recommended Texts	Modern HTML & CSS: From the Beginning (2022 Edition)" by Brad Traversy.	No
Websites	https://www.w3schools.com/html/ https://www.w3schools.com/css/default.asp https://www.w3schools.com/js/default.asp https://www.w3schools.com/php/default.asp https://www.w3schools.com/mysql/default.asp	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

Module Information

معلومات المادة الدراسية

Module Title	<u>Artificial Intelligence</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 3</u>				
ECTS Credits	<u>3</u>				
SWL (hr/sem)					
Module Level		3	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Sameera A. .Abdulkader		e-mail	purecomp.sameera.abdulkader@uodiyala.edu.iq	
Module Leader’s Acad. Title		Asst. Professor	Module Leader’s Qualification		Ph.D.
Module Tutor	Yousra Ahmed Fadil		e-mail	yousra.comp@uodiyala.edu.iq	
Peer Reviewer Name		Saad Q. Albawi	e-mail	saadalbawi@uodiyala.edu.iq	
Scientific Committee Approval Date		19/11/2024	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

96. To develop analytical and problem-solving skills through the application of AI algorithms and techniques for intelligent decision-making.
97. To gain a comprehensive understanding of fundamental concepts in machine learning, including supervised, unsupervised, and reinforcement learning paradigms.
98. To explore the structure, function, and training of artificial neural networks and understand their role in learning complex patterns and representations.
99. To evaluate AI models using appropriate performance metrics, and understand the importance of model generalization, bias-variance trade-off, and overfitting.
100. To understand the key components of intelligent systems including perception, reasoning, planning, and learning, and their integration in real-world applications.
101. To investigate advanced AI methods such as deep learning, natural language processing, and computer vision, and their practical implementations.
102. To examine ethical, social, and legal considerations in AI development and deployment, with a focus on responsible and explainable AI systems.

Module Learning Outcomes

مخرجات التعلم للمادة الدراسية

1. Recognize various types of AI data (structured, semi-structured, unstructured) and understand the role of data representation in intelligent systems.
2. Define and distinguish between different learning paradigms in AI, including supervised, unsupervised, and reinforcement learning, and explain their appropriate applications.
3. Identify key data preprocessing techniques and evaluate their impact on the performance and accuracy of AI models.
4. Explain the fundamental building blocks of artificial neural networks (neurons, weights, biases, activation functions) and analyze their roles in computational learning.
5. Describe the architecture and working of common neural network models, including feedforward and recurrent structures, and evaluate their suitability for different tasks.
6. Apply key machine learning principles—such as training, testing, validation, and model evaluation metrics (e.g., accuracy, precision, recall)—to real-world AI problems.
7. Explain advanced AI concepts such as genetic algorithms, fuzzy logic systems, and natural language processing, and analyze their relevance in building intelligent applications.

Indicative Contents

المحتويات الإرشادية

Indicative content includes the following.

Part A – Foundations of Artificial Intelligence

- Definitions and historical development of Artificial Intelligence
- Goals and real-world applications of AI across domains
- Key branches of AI: Machine Learning, Natural Language Processing (NLP), Computer Vision, and Robotics



	Overview of data types (structured, semi-structured, unstructured) and importance of data quality [15 hrs]
	Part B – Core Algorithms and Neural Architectures - Introduction to machine learning paradigms: supervised, unsupervised, and reinforcement learning - Data preprocessing techniques: normalization, encoding, and handling missing values - Architecture of neural networks: perceptrons, activation functions, layers, and forward/backward propagation - Application of learning laws (e.g., loss functions, optimization algorithms) in model training - Basic evaluation metrics and model validation techniques [24 hrs]
	Part C – Specialized AI Techniques and Emerging Topics - Introduction to Genetic Algorithms: selection, crossover, mutation, and evolutionary cycles - Fundamentals of Fuzzy Logic: fuzzy sets, membership functions, and applications in uncertain systems - Overview of Natural Language Processing (NLP): linguistic levels, common challenges, and core applications [6 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The primary instructional strategy for this module is to foster active student engagement through a combination of hands-on exercises, case studies, and practical implementations of AI techniques. Emphasis will be placed on
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enhancing students' **critical thinking, analytical reasoning, and problem-solving abilities** in the context of real-world AI applications.

This will be accomplished through interactive lectures, structured lab sessions, and assignment-based learning. Students will engage in tasks such as **training machine learning models, building neural network architectures, preprocessing real datasets, and analyzing algorithm performance**. Practical examples drawn from domains such as natural language processing, computer vision, and data mining will be used to reinforce theoretical knowledge and bridge the gap between concept and application.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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



Total assessment	100% (100 Marks)		
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Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Artificial Intelligence
Week 2	Data types and preprocessing: Fundamentals of Data and Data Types
Week 3	Introduction to Data
Week 4	Neural Networks: Introduction, Basic Terminologies
Week 5	The Perceptron and Activation Functions: Single-Layer Perceptron, Activation Functions
Week 6	Machine Learning: Supervised Machine Learning
Week 7	Unsupervised Machine Learning
Week 8	Genetic Algorithms: Fundamental Genetic Algorithm Cycle
Week 9	Crossover and Mutation Operators in Details
Week 10	Fuzzy Logic: Introduction, Core Concepts
Week 11	Fuzzy Sets and Membership Functions
Week 12	Natural Language Processing (NLP): Introduction, NLP Types: Symbolic NLP, Statistical NLP, Neural NLP
Week 13	NLP Processing, Applications of NLP
Week 14	Big Data: Introduction
Week 15	Big Data Storage and Management
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to Artificial Intelligence	
Recommended Texts	Machine Learning: The Basics	No
Websites	https://ethw.org/Category:Computational_and_artificial_intelligence?gad_source=1&gbraid=0AAAAADOXuoSI6zZYRydYIli-4cv4z0ra5&gclid=EAIaIQobChMIrdu3zvTzjAMVGIt0CR0ZUBeQEAAyAAEgKkivD_BwE	



Grading Scheme

مخطط الدرجات

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

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

Module Information

معلومات المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	<u>Digital Image Processing</u>			Module Delivery	
Module Type	<u>Core</u>			☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>CPE 312</u>				
ECTS Credits	<u>5</u>				
SWL (hr/sem)	<u>125</u>				
Module Level		3	Semester of Delivery		
Administering Department		Computer Eng.	College	College of Engineering	
Module Leader	Ali Jassim Abboud		e-mail	ali.j.abboud@uodiyala.edu.iq	
Module Leader’s Acad. Title		Assist. Professor	Module Leader’s Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		09/12/2024	Version Number	1.0	



Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CPE 303	Semester	5
Co-requisites module	None	Semester	-

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	103. To understand the basic types of images and applications of digital image processing. 104. To understand the operations of image enhancement, restoration and reconstruction. 105. The student learns how to use FFT and Wavelet to process images. 106. The student learns Morphological image processing operations. 107. The student learns the principles of image compression and segmentation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	70. Understand the tasks of image processing and their applications. 71. Learn and analyze image enhancement algorithms. 72. Learn and analyze image restoration algorithms. 73. Understand image color models. 74. Understand FFT and Wavelet Transforms. 75. Learn basic morphological operations. 76. Understand image compression algorithms. 77. Understand image segmentation algorithms.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction (3 hrs) • Basic image processing operations (3 hrs) • Image enhancement (9 hrs) • Image restoration (3 hrs) • Color image processing (3 hrs) • FFT and Wavelet Transforms (3 hrs) • Image morphological processing (6 hrs) • Image compression (6 hrs) • Image segmentation (6 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking
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skills. This will be achieved through classes, homework's and examples. Practical examples helps students to understand the course material.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

**Delivery Plan (Weekly Syllabus)**

المنهاج الاسبوعي النظري

	Material Covered
Week 1	- Fundamentals Steps in Image Processing. - Elements of Digital Image Processing Systems. - Image Sampling and Quantization.
Week 2	- Some basic relationships like Neighbors, Connectivity, and Distance Measures between pixels. - Translation, Scaling, Rotation, and Perspective Projection of image. - Linear and Non-Linear Operations. - Reading, Displaying, Writing Images - Data Classes, Image Types using - Converting Between data classes and Image Types
Week 3	- Some basic Gray Level Transformations, Histogram Processing - Enhancement Using Arithmetic and Logic operations - Combining Spatial Enhancement
Week 4	- Smoothing and Sharpening Spatial Filters - Intensity Transformation Function - Histogram Processing and Function Plotting
Week 5	- Introduction to Fourier transform and the frequency Domain - Computing and Visualizing the 2D DFT - Smoothing and Sharpening Frequency Domain Filters - Homomorphic Filtering
Week 6	- A model of The Image Degradation / Restoration Process - Noise Models - Restoration in the presence of Noise Only Spatial Filtering - Periodic Noise Reduction by Frequency Domain Filtering
Week 7	- Linear Position-Invariant Degradations - Estimation of Degradation Function - Inverse filtering, Wiener filtering, Geometric Mean Filter, Geometric Transformations
Week 8	- Color fundamentals and models - Basics of pseudo-color image processing - Basics of full-color image processing
Week 9	- Fourier Analysis – Shortcomings. - Wavelet Transforms, CWT, and DWT. - One Dimension (1D) DWT, Multi-Resolution 2D Wavelet Transforms. - Different Decomposition Schemes. - Statistical Properties of Wavelet subbands and Applications of DWT.
Week 10	- Morphological image processing - Erosion, dilation opening and closing - Hit-or-Miss Transformation - Boundary extraction and Region filling
Week 11	- Connected components. - Convex hull - Thinning and Thicking



	• Skeleton and Pruning
Week 12	• Image compression • Redundancy in images • Measuring image information • Fidelity criteria • Image compression models • Image formats and compression standards
Week 13	• Compression Methods • Huffman Coding. • Arithmetic Coding. • LZW Coding. • Bit-plane Coding. • Run Length Coding. • Symbol-based Coding
Week 14	• Image Segmentation • Detection of gray-level discontinuities (point, line, and edge) • Edge linking and boundary detection • Edge detection algorithms (prewit,sobel,canny,LoG). • Thresholding
Week 15	• Region-based segmentation • Segmentation by morphological watersheds • The use of motion in segmentation
Week 16	Preparatory week before the Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Basic Functions Used in Image Processing
Week 2	Visualization and plotting the results of experiments
Week 3	Reading, Displaying, Writing Images Data Classes, Image Types using Converting Between data classes and Image Types
Week 4	Gray Level Transformations, Histogram Processing and spatial enhancement
Week 5	Smoothing and Sharpening Spatial Filters Intensity Transformation Function Histogram Processing
Week 6	FFT Smoothing and Sharpening Frequency Domain Filters
Week 7	Basics of pseudo-color image processing Basics of full-color image processing
Week 8	Image noise models Image restoration



Week 9	DWT and their applications
Week 10	Morphological image processing Erosion, dilation opening and closing
Week 11	Hit-or-Miss Transformation Boundary extraction and Region filling Connected components. Convex hull Thining and Thicking Skeleton and Pruning
Week 12	Compression Methods Huffman Coding. Arithmetic Coding. LZW Coding.
Week 13	Bit-plane Coding. Run Length Coding. Symbol-based Coding
Week 14	sobel, canny, LoG). Edge detection algorithms (prewit,
Week 15	Image Segmentation Region-based segmentation Segmentation by morphological watersheds The use of motion in segmentation

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	R. C. Gonzalez and R. E. Woods., “<i>Digital Image Processing</i>”, third edition. ISBN: 0-13-168728-x, 978-0-13-168728-8, Pearson-Prentice-Hall, 2008. www.imageprocessingplace.com : (website) R. C. Gonzalez, R. E. Woods, S. L. Eddins, “<i>Digital Image Processing using Matlab</i>”, 2nd edition, ISBN: 0-13-008519-7, Pearson-Prentice-Hall, 2004	Yes
Recommended Texts	- Kenneth R. Castleman, <i>Digital Image Processing</i>, Pearson, 2006. - D.E. Dudgeon and RM. Mersereau, , <i>Multidimensional Digital Signal Processing</i>, Prentice Hall Professional Technical Reference, 1990. - William K. Pratt, , <i>Digital Image Processing</i> , John Wiley, New York, 2002 - Milan Sonka et al, <i>Image Processing, Analysis and Machine Vision</i>, Brookes/Cole, Vikas Publishing House, 2nd edition, 1999, - R.O. Duda and P.E. Hart, “<i>Pattern Classification and Scene Analysis</i>”. - A.K. Jain, “<i>Fundamentals of Digital Image Processing</i>”	yes



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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