نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة .كلكامش

الكلية/ المعهد: كلية الهندسة

القسم العلمي: قسم هندسة الحاسوب

اسم البرنامج الأكاديمي او المهني: بكالوريوس

اسم الشهادة النهائية: بكالوريوس في هندسة الحاسوب

النظام الدراسي: المقررات

تاريخ اعداد الوصف:

التوقيع :

اسم رئيس القسم:

التاريخ :

التوقيع :

اسم المعاون العلمي:

التاريخ :

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي:

التاريخ ١٢/ ٨/ ٢٠٢٥

التوقيع

مصادقة السيد العميد

1. رؤية البرنامج

رؤيتنا هي تعزيز بيئة يزدهر فيها التميز في مجال هندسة الحاسوب على المستويين المحلي والإقليمي، من خلال توفير بيئة تعليمية وبحثية مبتكرة تُسهم في تطوير المعرفة التقنية وتعزيز مهارات الإبداع والابتكار لدى الطلبة. كما يطمح القسم إلى إعداد مهندسين يمتلكون كفاءة عالية في مجالات البرمجة، الذكاء الاصطناعي، نظم المعلومات، وشبكات الحاسوب، بما يتوافق مع متطلبات سوق العمل ويساهم في خدمة المجتمع ودعم مسيرة التحول الرقمي والتنمية المستدامة حيث يعتبر هذا الجيل من المهندسين هم قادة المستقبل والذين سيقودون كل جوانب التكنولوجيا المتقدمة .

2. رسالة البرنامج

مهمتنا هي تمكين الطلاب في قسم هندسة الحاسوب من التعليم المفاهيم الاساسية في مجال التكنولوجيا من اجل تعزيز مهاراتهم في الجوانب العلمية والعملية التي تمكنهم من اجراء بحوث متقدمة وابتكار أفكار جديدة من اجل تعزيز احتياجات التطور التي يحتاجها سوق العمل .

3. اهداف البرنامج

أهداف قسم هندسة الحاسوب الاستراتيجية في كلية الهندسة / جامعة كلكامش. بعد اجتياز الطالب المراحل الدراسية الأربعة، ان يكون الخريج :

- توفير تعليم فعال وشامل بعد الطلاب لمهن ناجحة في مجال الهندسة
- أجراء أبحاث عالية التأثير تعمل على تطوير المعرفة وتلبية الاحتياجات المجتمعية الحرجة.
- تعزيز التنوع والمساواة والشمول داخل المجتمع الهندسي
- التعاون مع شركاء الصناعة وأصحاب المصلحة لأنشاء تعاون وفرص هادفة للطلاب وأعضاء هيئة التدريس.
- المساهمة في تطوير التقنيات والممارسات المستدامة التي تعود بالنفع على المجتمع والبيئة.
- تهيئة خريجين يمتلكون الامكانية العلمية والعملية في مجال هندسة الحاسوب .
- تهيئة كوادر هندسية مهنية ومتطورة قادرة على تصميم انظمة وبرامج الحاسوب و تحليلها و تطويرها .
- تعزيز التعليم المستمر والتطوير المهني لدى الخريجين
- تحفيز الخريجين للمشاركة في الجمعيات المهنية وخدمة المجتمع

4. الاعتماد البرامجي

في إطار سعي قسم هندسة الحاسوب في كلية الهندسة جامعة كلكامش فإن القسم في طور استكمال المتطلبات للحصول على الاعتماد البرامجي

5. المؤثرات الخارجية الأخرى

سوق العمل الزيارات العلمية والميدانية للدوائر الحكومية والشركات ذات العلاقة, المجلس الاستشاري الصناعي في كلية الهندسة

6. هيكلية البرنامج

هيكل البرنامج	عدد المقررات	وحدة دراسية	النسبة المئوية	ملاحظات *
متطلبات المؤسسة	9	18	%15.5	
متطلبات الكلية	10	20	%17.2	
متطلبات القسم	39	78	%67.2	
التدريب الصيفي				
أخرى				

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

7. وصف البرنامج :نظام المقررات

السنة / المستوى	رمز المقرر أو المساق	اسم المقرر أو المساق	الساعات المعتمدة	
			نظري	عملي
المرحلة الثالثة كورس اول	**COE31201**	الاحتمالية	**2**	
المرحلة الثالثة كورس اول	**COE31204**	هندسة البرمجيات	**2**	
المرحلة الثالثة كورس اول	**COE31203**	الإشارات والأنظمة	**2**	
المرحلة الثالثة كورس اول	**COE31205**	رسومات الحاسوب	**2**	2
المرحلة الثالثة كورس اول	**COE31202**	المعالجات الدقيقة 1	**2**	**2**
المرحلة الثالثة كورس اول	**COE31206**	أنظمة السيطرة	**2**	2
المرحلة الثالثة كورس اول	**COE31207**	أنظمة قواعد البيانات	**2**	**2**
المرحلة الثالثة كورس اول	**GU31**	اللغة الإنكليزية 3	**2**	

المرحلة الثالثة/ كورس ثاني	COE32201	تحليلات عددية	2	
المرحلة الثالثة/ كورس ثاني	COE32302	نظم قواعد البيانات	2	2
المرحلة الثالثة/ كورس ثاني	COE32203	معالجة الإشارة الرقمية	2	
المرحلة الثالثة/ كورس ثاني	COE32202	المعالجات الدقيقة 2	2	2
المرحلة الثالثة/ كورس ثاني	COE32204	شبكات الحاسوب	2	2
المرحلة الثالثة/ كورس الثاني	COE32205	واجهة المستخدم الرسومية	2	2
المرحلة الثالثة/ كورس الثاني	COE32207	أنظمة الموزعة	2	

1.مخرجات التعلم المتوقعة للبرنامج	
المعرفة	
مخرجات التعلم	**بيان نتائج التعلم**
اكتساب المعرفة الأساسية والتي تتضمن البرنامج توفير فهم عميق وشامل لجميع مفاهيم والمبادئ الأساسية لهندسة الحاسوب بما في ذلك المفاهيم الاساسية للرياضيات والبرمجة وهياكل البيانات والخوارزميات	– فهم مفاهيم ومبادئ الاساسية لهندسة الحاسوب مثل البرمجة وهياكل البيانات والخوارزميات – القدرة على تحليل المشاكل البرمجية وتطوير حلول باستخدام المفاهيم المكتسبة
2. فهم الإشارات الرقمية : يتضمن البرنامج دراسة الإشارات الرقمية وتحليلها وتطبيقاتها في مجالات مختلفة مثل معالجة الإشارات الرقمية والاتصالات الرقمية	– القدرة على تحليل الإشارات وفهم اليات تحويل الإشارات بين أنظمة التمثيل المختلفة – التمكن من تصميم وتنفيذ الخوارزميات الرقمية لمعالجة الإشارات والبيانات
3– معرفة مبادئ شبكات الحاسوب: يتناول البرنامج دراسة شبكات الحاسوب بدءا من مفاهيم الشبكات الأساسية وانتهاء بتصميم وإدارة الشبكات بمافي ذلك توصيل الأجهزة وتشخيص وحل المشكلات	– فهم جميع المفاهيم الأساسية لشبكات الحاسوب وبروتكولات الاتصال التي تستخدم في الشبكات وكذلك كيفية عمل حماية للشبكة – التمكن من تصميم وتكوين وإدارة الشبكات وحل المشكلات التقنية المتعلقة بها
4–لغات البرمجة : يتيح البرنامج للطلاب فرصة التعرف على مجموعة متنوعة من لغات البرمجة وفهم كيفية استخدامها	– اكتساب المهارات في استخدام لغات البرمجة المختلفة والتي تعتبر الأساسية في تطبيق البرامج العملية لبيئة العمل مثل , java, C++ > python ولغات تصميم الويب وغيرها

وتطبيقها في تطوير البرمجيات وحل المشاكل الهندسية	– القدرة على تطوير التطبيقات البرمجية وحل المشاكل التي ممكن يوجهها في البرمجة بطريقه سهله وسريعة
المهارات	
مخرجات التعلم	**نتائج التعلم**
تطوير مهارات صياغة والعمل على بناء تطبيقات برمجية متطورة يمكن الاستفادة منها في الحياة العملية وذلك من خلال استخدام لغات البرمجة المتطورة التي تخدم التطبيقات الحديثة	– يتمكن الطلاب من اكتساب مهارات تصميم وتطوير التطبيقات البرمجية بشكل مستقل مما يمكنهم من انتاج حلول برمجية مبتكرة لمختلف التحديات التقنية.
اكتساب المهارات الازمة لتشخيص وصيانة الاجهزة الحاسوبية بفعالية	– يكتسب الطلاب القدرة على تحليل وحل المشاكل التقنية في الاجهزة الحاسوبية بشكل فعال، مما يساهم في زيادة كفاءة وفاعلية الانظمة التقنية
تصميم وتكوين وصياغة الشبكات والانظمة الحاسوبية وربط الدوائر الكهربائية	– يكتسب الطلاب المعرفة والمهارات اللازمة لتصميم وادارة الشبكات الحاسوبية بشكل متقدم , مما يساعدهم في بناء بنية تحتية تقنية متطورة وأمنة
تطوير وتنفيذ حلول لمعالجة الاشارات الرقمية باستخدام اساليب متقدمة	يتمكن الطلاب من تطبيق مفاهيم وتقنيات معالجة الاشارات الرقمية في حل مجموعة متنوعة من المشاكل التقنية، مما يعزز قدرتهم على تطوير حلول مبتكرة وفعالة في هذا المجال
القيم	
مخرجات التعلم	**نتائج التعلم**
تعزيز الابداع والابتكار حيث يهدف البرنامج الى زرع روح الابداع والتحفيز على أيجاد حلول مبتكرة للتحديات المختلفة في مجال هندسة الحاسوب	زرع روح الابداع والابتكار لدى الطلاب وتنمية مهاراتهم في ايجاد حلو مبتكرة
تطوير مهارات العمل الجماعي حيث يسعى البرنامج الى تعزيز قدرة الطلاب على العمل كفرق جماعية فعالة مما يسهم في تحقيق مخرجات مميزة وفعالة	تطوير قدرات العمل الجماعي للطلاب مما يؤدي الى تحقيق مخرجات مميز
تحفيز المسؤولية الاجتماعية حيث يهدف البرنامج الى تنمية الشعور بالمسؤولية لدى الطلاب وتهيئتهم نفسيا لتحمل المسؤولية في مجتمع العمل والمجتمع بشكل عام	تعزيز المسؤولية الاجتماعية والتحمل المسؤولية في المجتمع والعمل
تعزيز قيم الحرص والمثابرة حيث يركز البرنامج على تنمية فهم الحرص والمثابرة لدى الطلاب مما يعزز ارادتهم للوصول	تعزيز قيم الحرص والمثابرة مما يساهم في تحقيق النجاح الاكاديمي والمهني

الى نتائج مرضية وتحقيق النجاح في مساراتهم الاكاديمية والمهنية	

1. استراتيجيات التعليم والتعلم
1. الشرح والتوضيح عبر المحاضرات حضوريا والكترونيا . 2. عرض المواد العلمية باستخدام أجهزة العرض المتنوعة 3. التعلم الذاتي من خلال الواجبات المنزلية والمشروعات الصغيرة 4. استخدام المختبرات في التعلم والتطبيق العملي 5. أنجاز مشاريع التخرج كجزء من تجربة التعلم 6. الاستفادة من الزيارات العلمية للمواقع ذات الاهتمام 7. حضور السمنارات العلمية التي تعقد في القسم 8. أتاحه فرص التدريب الصيفي لتطوير المهارات العلمية

2. طرائق التقييم
1-اختبارات الفهم القصيرة (كوز) 2-الواجبات المنزلية

3. الهيئة التدريسية						
أعضاء هيئة التدريس						
الرتبة العلمية	التخصص		المتطلبات/المهارات الخاصة (ان وجدت)		اعداد الهيئة التدريسية	
	عام	خاص			ملاك	محاضر
جعفر علي جعفر	هندسة الاتصالات	هندسة النظم الضوئية			ملاك	
حنين جمهور صبار	هندسة معلومات	هندسة شبكات			ملاك	
اية عبدالرحمن كاظم	هندسة الطاقة	هندسة الطاقة			ملاك	

حوراء احمد جاسم عريبي	هندسة المعلومات	هندسة المعلومات والاتصالات			ملاك	

التطوير المهني
توجيه أعضاء هيئة التدريس الجدد
1–تقديم توجيه شامل حول طبيعة العمل والأهداف والقيم الإيمانية للمؤسسة والقسم 2–توفير دورات تدريبية متخصصة تشمل أساليب التدريس المبتكرة وأفضل الممارسات الأكاديمية 3–توجيه الهيئة التدريسية حول سياسات وإجراءات المؤسسة والقسم, بما في ذلك الأخلاقيات البحثية ومعايير الجودة. 4–توفير فرص للتواصل مع الزملاء والمشاركة في نشاطات البحث والتطوير المهني. 5–متابعة أداء الهيئة التدريسية الجديدة وتقديم الدعم والتوجيه الإضافي حسب الحاجة
التطوير المهني لأعضاء هيئة التدريس
1. تقديم دورات تدريبية متخصصة في استراتيجيات التدريس الفعالة وتكنولوجيا التعليم الحديثة. 2. توفير ورش عمل لتبادل الخبرات والممارسات الأفضل في مجال التدريس وتطبيقها في الصف. 3. إجراء تقييم دوري لأداء الهيئة التدريسية ونتائج التعلم لتحسين العملية التعليمية. 4. تعزيز المشاركة في برامج التطوير المهني المستمرة مثل الندوات ودورات العمل والمؤتمرات الأكاديمية. 5. دعم البحث والنشر الأكاديمي لتطوير الكفاءة الأكاديمية لأعضاء هيئة التدريس. 6. توفير فرص للتواصل والتعاون مع الهيئة التدريسية في مجالات الاهتمام المشترك 7. تقديم برامج خاصة لتطوير مهارات الإدارة الأكاديمية والقيادية.

4. معيار القبول

يكون الالتحاق بالكلية عن طريق القبول المركزي بالنسبة للدراسة الصباحية:

- المعدل: لا يقل عن 61% (لخريجي الدراسة الاعدادية–علمي,تطبيقي,احيائي)
- المعدل: لا يقل عن 64%(لخريجي الدراسة المهنية–الحاسوب, تكنولوجيا معلومات, الحاسوب وتقنية المعلومات وصيانة الحاسوب ,شبكات الحاسوب, والهاتف المحمول ,والإدارة الالكترونية)
- أما بالنسبة إلى الدراسة المسائية فيكون القبول عن طريق التقديم المباشر:
- المعدل: لا يقل عن 60% (لخريجي الدراسة الاعدادية–علمي,تطبيقي,احيائي)

- المعدل: لا يقل عن 60%(لخريجي الدراسة المهنية–الحاسوب, تكنولوجيا معلومات, الحاسوب وتقنية المعلومات وصيانة الحاسوب ،شبكات الحاسوب, والهاتف المحمول ,والإدارة الالكترونية)
- العمر: غير محدد

5. أهم مصادر المعلومات عن البرنامج

1. مواقع الجامعات الالكترونية المحلية والدولية
2. ورش العمل المنظمة من قبل وزراه التعليم العالي ومعايير الجودة الخاصة بها
3. دليل المجلس العراقي لاعتماد التعليم الهندسي
4. IEEE Computer Engineering Body of Knowledge

6. خطة تطوير البرنامج

1. تحليل الاحتياجات: أجراء استطلاعات واستطلاعات لتحديد احتياجات سوق العمل وتوجيهات الصناعة واستقصاء أراء الطلاب والهيئة التدريسية بخصوص نقاط القوة والضعف في البرنامج الحالي
2. تحديث المناهج: تطوير مناهج تعليمية حديثة تتماشى مع التطورات التكنولوجية الحديثة واحتياجات سوق العمل بما في ذلك أضافة مقررات جديدة وتحديث المقررات القادمة.
3. تعزيز التفاعلية: ادماج وسائل تعليمية تفاعلية مثل المختبرات الافتراضية والمشاريع العلمية ورش العمل لتعزيز تجربة التعلم وتطبيق المفاهيم النظرية في مشاريع عملية.
4. التركيز على المهارات العلمية : تطوير برامج تدريبة تركز على التنمية المهارات العلمية للطلاب مثل البرمجة وتصميم الانظمة وادارة المشاريع بالإضافة الى تعزيز مهارات الاتصال والعمل الجماعي.
5. تعزيز البيئة التعليمة : تحسين بنية التحتية التقنية وتوفير الموارد الازمة وتعزي التفاعل بين الطلاب والهيئة التدريسية من خلال المنتديات الافتراضية والندوات والمحاضرات الجماعية
6. متابعة وتقييم أنشاء اليات لمتابعة وتقيم أداء البرنامج الدراسي وتحليل البيانات الطلاب ومدى تحقيقهم لأهداف التعلم مما يمكن من أتخاذ للتدابير اللازمة لتحسين البرنامج
7. التعاون مع الصناعة بناء شراكات والمؤسسات الصناعية لتوجيه وتطوير البرنامج الدراسي وتوفير فرص التدريب والتوظيف للطلاب.
8. التحديث المستمر : أجراء استعراض دوري وتحديثات للبرنامج الدراسي بناء على تغيرات السوق والتكنولوجيا واحتياجات الصناعة لضمان استمرارية توفير تعليم ذو جودة عالية ومتميزة

مخطط مهارات البرنامج

السنة / المستوى	رمز المقرر	اسم المقرر	اساسي أم اختياري	مخرجات التعلم المطلوبة من البرنامج											
				المعرفة				المهارات				القيم			
				أ1	أ2	أ3	أ4	ب1	ب2	ب3	ب4	ج1	ج2	ج3	ج4
المرحلة الثالثة كورس اول	COE31201	الاحتمالية	اساسي	●	●			●				●	●		
المرحلة الثالثة كورس اول	COE31202	هندسة البرمجيات	اساسي	●			●	●	●			●	●	●	●
المرحلة الثالثة كورس اول	COE31203	الإشارات والأنظمة	اساسي	●	●			●	●	●	●	●	●	●	
المرحلة الثالثة كورس اول	COE31205	رسومات الحاسوب	اساسي	●	●			●	●	●		●	●		
المرحلة الثالثة كورس اول	COE31202	المعالجات الدقيقة 1	اساسي	●	●			●	●	●		●	●		
المرحلة الثالثة كورس اول	COE31206	أنظمة السيطرة	اساسي	●	●			●	●	●		●	●		
المرحلة الثالثة كورس اول	COE31207	نظم قواعد البيانات	اساسي	●	●			●	●	●		●	●		
المرحلة الثالثة كورس اول	GU31	اللغة الانكليزية3		●	●			●	●	●		●	●		
المرحلة الثالثة/ كورس ثاني	COE32201	تحليلات عددية	اساسي	●	●			●				●			

المرحلة الثالثة/ كورس ثاني	COE32206	الأنظمة الموزعة	اساسي	•			•	•	•	•		•	•	•	•		•	•	•
المرحلة الثالثة/ كورس ثاني	COE32203	معالجة الإشارة الرقمية	اساسي	•	•			•	•	•	•	•	•	•	•		•	•	
المرحلة الثالثة/ كورس ثاني	COE32205	واجهة المستخدم الرسومية	اساسي	•		•	•	•	•	•		•	•		•	•			
المرحلة الثالثة/ كورس ثاني	**COE32205**	تطبيقات المعالجات الدقيقة	اساسي	•			•	•	•	•		•	•		•	•			
المرحلة الثالثة/ كورس ثاني	**COE32206**	شبكات الحاسوب	اساسي			•	•		•	•	•	•	•	•	•	•	•	•	•
المرحلة الثالثة/ كورس ثاني	COE32207	أنظمة السيطرة الرقمية	اساسي			•	•		•	•	•	•	•	•	•	•	•	•	•

نماذج وصف المقررات
لقسم هندسة الحاسوب
2025-2024

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Probability

1. Course Name: Probability
2. Course Code: COE31201
3. Semester / Year: Semester 1 \ 2024-2025
4. Description Preparation Date: 01/10/2024
5. Available Attendance Forms: Offline, In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours of study in the classroom / 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: - Email: - Ola.a.ahmed@gu.edu.iq

8. Course Objectives	
Course Objectives	The aim of this course is to know the definition and use of the principles of probability study all cases that are treated through the article. The focus will be on studying anot aspect of mathematics in an analytical and probabilistic manner that is easy to use in or courses and sciences. Students will learn some probability and statistical techniques identifying the discontinuous and continuous variables and how to deal with each of the the relation between the variables according to the correlation coefficient.

9. Teaching and Learning Strategies	
Strategy	The student will learn the basic and applied concepts of probability and statics with the following fundamentals: A1. The student acquires a general definition of probability and the possibility of apply it in other sciences, scientifically and humanly A2. Studying the methods and methods used in solving questionnaires and analyzing problems about principles of counting. A3. Enable the student to understand the content of probability and how it overlaps wit the rest of the sciences A4. Identify the odd and common marginal functions A5. Understanding the types of probability and how to differentiate between it. A6. Identifying the discontinuous and continuous variables and how to deal with each o them. A7. Studying the statistical measures, relation between them and how we applicate it w respect to real problems

	A8. Studying the statistical distributions with respect to types of variables and applicate the measures on it. A9. Studying the relation between x & y according to correlation coefficient of joint probability distribution. B. The skills goals special to the course of probability B1. The possibility of predicting life issues and their behavior in the future or in the pas B2. The possibility of using probabilistic measures to solve the probability distributions the samples and the population B3. The ability to relate vital issues to possibility and to find possible solutions to them, or hypothetical

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical	A1, B1, C1	Introduction and principles of probability and its applications, definition of sample, population and sample space	In class	In class activities
Week 2	2 Theoretical	A1, B1, C1	Counting principles, permutations and combinations	In class	In class activities and home duties
Week 3	2 Theoretical	A1, B1, C1	Probabilistic functions, types of probability variables	In class	In class activities
Week 4	2 Theoretical	A2, B2, C2	Probability Distributions, Tables and Charts	In class	In class activities
Week 5	2 Theoretical	A2, B2, C2	Measures of Central Tendency	In class	In class activities and home duties
Week 6	2 Theoretical	A2, B2, C2	Measures of central tendency and measures of dispersion	In class	In class activities and home duties
Week 7	2 Theoretical		The relation between measures of dispersion and measures of central tendency and their importance	In class	In class activities and home duties
Week 8	2 Theoretical	A3, B3, C3	Elementary probability and conditional probability	In class	Quiz 1
Week 9	2 Theoretical	A3, B3, C3	midterm exam	In class	Questions during the lecture
Week 10	2 Theoretical	A3, B3, C3	Finding the functions of probability, expectation and variance	In class	Home duties and questions during the lecture
Week 11	2 Theoretical	A3, B3, C3	Probability distributions of discrete variables	In class	Mid Term
Week 12	2 Theoretical	A4, B4, C4	Probability Distributions of Continuous Variables	In class	Quiz 2

Week 13	2 Theoretical	A4, B4, C4	Joint Probability Functions	In class	In class activities
Week 14	2 Theoretical	A4, B4, C4	Joint expectation, covariance, and correlation coefficient	In class	Assignment Presentation
Week 15	2 Theoretical	A4, B4, C4	Comprehensive semester exam	In class	In class activities
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports..... etc

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	Probability and statistics for engineering a scientists by: Walpole and Myers.
Main references (sources)	Applied Mathematics Journals, Schaum Series Probability and Statistics
Recommended books and references (scientific journals, reports...)	Research in research engines specialized in scientist research such as: • Google scholar • Science direct • IEEE.
Electronic References, Websites	Here's a summary of important URLs related to t book: https://www.coursera.org/learn/ probability

Software Engineering

1. Course Name: Software Engineering
2. Course Code: COE31204
3. Semester / Year: Semester 1 \ 2024-2025
4. Description Preparation Date: 01/10/2024
5. Available Attendance Forms: Offline, In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours of study in the classroom / 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: - Email: - lina.t.sultan@gu.edu.iq
8. Course Objectives

Course Objectives	This course provides a comprehensive exploration of fundamental concepts of soft engineering. this course, designed for engineering students, is given at the various pha of the software development process, including requirements gathering, system des implementation, testing, deployment, and maintenance. Software Requirement Engineering Learn techniques for eliciting, analyzing, documenting, and managing software requirements. Explore methods to ensure that requirements are complete, consistent, feasible. Software Design and Architecture Study principles and practices of design software systems and their architectures. Learn about software design modularization, coupling and cohesion, and trade-offs betweer different architect styles. Programming Principles and Practices Gain proficiency in programming language coding standards, and best practices for developing reliable and maintainable software Learn about code refactoring, code reviews, and code quality assurance techniques. Ove the course aims to equip students with a strong theoretical foundation and practical sk essential for success in various engineering disciplines

9. Teaching and Learning Strategies

Strategy	A.1 Understand the various phases of the software development process, including requirements gathering, system design, implementation, testing, deployment, and maintenance. A.2 Ability to Apply Software Development Processes: Learn techniques for eliciting, analyzing, documenting, and managing software requirements. A.3 Study principles and practices of designing software systems and their architecture A.4. Learn about code refactoring, code reviews, and code quality assurance techniques A.5.Understand testing techniques, strategies, and methodologies to validate software functionality, reliability, and performance. Learn about different types of testing, such a unit testing, integration testing, system testing, and acceptance testing. A.6 Understand the importance of documentation, version control, and change management in the software maintenance process. A.7 Learn about project planning, scheduling, resource allocation, risk management, an team coordination. A.8. Understand the principles and practices of managing software configuration including version control, release management, and software baselining. Learn about to and techniques for configuration management.

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical	A1, B1, C1	Software Development process:	In class	In class activities
Week 2	2 Theoretical	A1, B1, C1	• Feasibility and planning	In class	In class activities and home duties
Week 3	2 Theoretical	A1, B1, C1	• Requirements	In class	In class activities
Week 4	2 Theoretical	A2, B2, C2	• Design	In class	In class activities
Week 5	2 Theoretical	A2, B2, C2	• Implementation	In class	In class activities and home duties
Week 6	2 Theoretical	A2, B2, C2	• Acceptance and release	In class	In class activities and home duties
Week 7	2 Theoretical		Operation and maintenance	In class	In class activities and home duties
Week 8	2 Theoretical	A3, B3, C3	Software Processes:	In class	Quiz 1
Week 9	2 Theoretical	A3, B3, C3	1.Sequential The Waterfall Model,	In class	Questions during the lecture
Week 10	2 Theoretical	A3, B3, C3	2.Iterative Refinement (Evolutionary Development),	In class	Home duties and questions during the lecture
Week 11	2 Theoretical	A3, B3, C3	3.Phased Development	In class	Mid Term

Week 12	2 Theoretical	A4, B4, C4	Requirements Analysis and Specification	In class	Quiz 2
Week 13	2 Theoretical	A4, B4, C4	Requirements in Software Development, Requirements in the Waterfall Model, Requirements in Iterative Refinement, Goals During the Requirements Phase, Why are Requirements Important, The Requirements Process, Requirements Analysis, Requirements Documentation. Requirement specification.	In class	In class activities
Week 14	2 Theoretical	A4, B4, C4	Modeling Techniques for Requirements Analysis and Definition	In class	Assignment Presentation
Week 15	2 Theoretical	A4, B4, C4	UML modeling, Data-Flow Models, Entity-Relation Model	In class	In class activities
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .....etc

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	• Somerville, Software Engineering. 7th or 8 Edition.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Research in research engines specialized in scient research such as: • Google scholar • Science direct • IEEE.
Electronic References, Websites	Here's a summary of important URLs related to t book: https://www.coursera.org/learn/software engineering

Microprocessor

1. Course Name: Microprocessor
2. Course Code: COE31202
3. Semester / Year: Semester 1 \ 2024-2025
4. Description Preparation Date: 01/10/2024
5. Available Attendance Forms: Offline, In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours of study in the classroom / 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: - Email: - lina.t.sultan@gu.edu.iq

8. Course Objectives	
Course Objectives	a) To gain the practical concept of 8086 microprocessors, its architecture, operate and interfacing with other peripheral devices. b) To develop the skill of assembly language programming using instruction set. c) To be familiar with possible microprocessor-based design and operation for practical applications.

9. Teaching and Learning Strategies	
Strategy	The student will learn the basic and applied concepts of Computer Engineering with following fundamentals: A.1. Understand the fundamentals of microprocessor. A.2. Knowledge about the structure of 8086 microprocessor used in a wide variety disciplines in engineering. A.3. execute instructions quickly and efficiently. This involves optimizing instruct pipelines, designing efficient caching mechanisms, and employing sophisticated bra prediction techniques to minimize processing delays.. A.4. Introduction to the Assembly Language with 8086 microprocessor. A.5. Started with simple Instruction sets and apply on the 8086 assembly language A.6. Understand the concept of writing Integrated code on the 8086 Assem language. A.7. Effective memory management is crucial for optimizing performance resource utilization by apply on the 8086 assembly language. A8. Design and ensure reliable operation under diverse operating conditions environmental factors by flags, and memory when used 8086 assembly language.

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical		Introduction to the microprocessor and computer.	In class	In class activities
Week 2	2 Theoretical		Main structural component of a computer system	In class	In class activities and home duties
Week 3	2 Theoretical		Intel 8086	In class	In class activities
Week 4	2 Theoretical		microprocessor - Internal Architecture	In class	In class activities
Week 5	2 Theoretical		The 8086 Hardware Specifications. Pin-outs and the pin functions.	In class	In class activities and home duties
Week 6	2 Theoretical		Unsigned and signed numbers	In class	In class activities and home duties
Week 7	2 Theoretical			In class	Mid Term
Week 8	2 Theoretical		Mid-term Exam	In class	In class activities & Quiz
Week 9	2 Theoretical		Instruction Set and Programming - Data Movement Instructions.	In class	In class activities & Questions during the lecture
Week 10	2 Theoretical		Instruction Set and Programming – Arithmetic and Logical Instructions.	In class	In class activities & Questions during the lecture
Week 11	2 Theoretical		Instruction Set and Programming – shift and rotate instructions	In class	In class activities
Week 12	2 Theoretical		Assembly language examples	In class	In class activities
Week 13	2 Theoretical		The 8086/8088	In class	In class activities
Week 14	2 Theoretical		microprocessor Architecture and pin configuration Minimum mode: Bus timing. e-Ready and the wait state	In class	In class activities
Week 15	2 Theoretical		The 8086/8088	In class	In class activities
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ..... etc

12. Learning and Teaching Resources

Required textbooks (curricular books any)	• Douglas V Hall, Microprocessor a Interfacing: Programming and Hardware, 2 Edition, Tata McGraw-Hill Publishing Compa Limited, 7 West Patel Nagar, New Delhi.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	https://kader05cuet.wordpress.com/lecture-materials- 2/microprocessor-and interface sessional/
Electronic References, Websites	

Signals and Systems

1. Course Name: Signals and Systems	
2. Course Code: COE31203	
3. Semester / Year: Semester 1 \ 2024-2025	
4. Description Preparation Date: 01/10/2024	
5. Available Attendance Forms: Offline, In class	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours per week / 30 hours of study in the classroom / 2 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: - Email: - dunya.zeki@gu.edu.iq	
8. Course Objectives	
Course Objectives	The aim of this course is to develop an understanding of the basic ideas of the Signal Systems encountered in engineering. The focus will be on the methods for characterizing analyzing continuous-time signals and systems. Students will learn some transform techniques (Fourier transform) that are useful for the understanding of Dig communication systems, Feedback control systems, Satellite and mobile communicate Digital signal processing and Digital image processing.
9. Teaching and Learning Strategies	

Strategy	The student will learn the basic and applied concepts of Signals and Systems with the following fundamentals: A.1. Understand the fundamentals of signals and systems. A.2. Express the concepts of signals and systems and their different types which can be u in a wide variety of disciplines in engineering. A.3. Identify and report system properties such as causality, stability, linearity, and time invariance etc. A.4. Apply the convolution formula to determine the output of time systems. A.5. Understand and resolve the analog time signals in frequency domain using Fourier series and Fourier transforms. A.6. Understand the concept of Filter Analysis and design and its types (FIR & IIR) and applications. A.7. Understand the concept of FIR filter design and develop the ability to design filters using different windows. A.8. Understand the concept of IIR filter design and develop the ability to design filters using different methods. B. The skills goals special to the course of Signals and Systems B.1 Develop proficiency in analyzing signals, understanding their characteristics, and interpreting information embedded in different types of signals. B.2 Acquire skills in modeling engineering systems, translating real-world systems into mathematical representations for analysis and design. B.3 Master transform techniques, particularly Fourier transforms, to analyze signals in the frequency domain, providing insights into system behavior. B.4 Learn to design filters for various applications, such as signal processing and communication systems, considering specifications and constraints. B.5 Understand and apply time and frequency domain analysis methods to evaluate system performance and behavior. B.6 Develop skills in digital signal processing, covering aspects such as discrete-time sign analysis, filter design, and implementation. B.7. Apply signals and systems concepts to analyze and design communication systems, including modulation, demodulation, and channel coding. B.8. Analyze the effects of noise on signals and systems, addressing challenges related to noise in practical engineering scenarios. B.9. Relate signals and systems concepts to real-world applications in fields such as telecommunications, audio processing, image processing, and biomedical engineering. B.10. Comprehend how systems respond to different inputs, studying transient and stead state behavior.

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical	A1, B1, C1	Fundamental Concepts of Signals & Systems - Introduction	In class	In class activities
Week 2	2 Theoretical	A1, B1, C1	Signals and Their Classification	In class	In class activities and home duties
Week 3	2 Theoretical	A1, B1, C1	Operations on Signals	In class	In class activities

Week 4	2 Theoretical	A2, B2, C2	Systems and Classification of Systems - Interconnections of Systems	In class	In class activities
Week 5	2 Theoretical	A2, B2, C2	Linear Time Invariant Systems - Introduction	In class	In class activities and home duties
Week 6	2 Theoretical	A2, B2, C2	Properties of Continuous Time LTI System	In class	In class activities and home duties
Week 7	2 Theoretical		Mid-term Exam	In class	In class activities and home duties
Week 8	2 Theoretical	A3, B3, C3	Signal convolution method - integral formula	In class	Quiz 1
Week 9	2 Theoretical	A3, B3, C3	The Fourier Transform - Introduction	In class	Questions during the lecture
Week 10	2 Theoretical	A3, B3, C3	Laplace Transform -Review	In class	Home duties and questions during the lecture
Week 11	2 Theoretical	A3, B3, C3	Filter Analysis	In class	Mid Term
Week 12	2 Theoretical	A4, B4, C4	Filter Analysis and design (FIR & IIR)	In class	Quiz 2
Week 13	2 Theoretical	A4, B4, C4	FIR Filter Analysis and design	In class	In class activities
Week 14	2 Theoretical	A4, B4, C4	IIR Filter Analysis and design- Butterworth Analog Filters	In class	Assignment Presentation
Week 15	2 Theoretical	A4, B4, C4	IIR Filter Analysis and design- Cheby-Chev Analog Filters	In class	In class activities
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ..... etc

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	• Alan V. Oppenheim, Signals & Systems 2 Edition, Pearson Education, 2008. • Signals and Systems, Simon Haykin and Ba Van Veen, 2nd edition, Wiley 2005.
Main references (sources)	• "Distributed Systems: Principles and Paradigms" by Andrew S. Tanenbaum and Maarten Van Steen • "Real-Time Systems" by Jane W. S. Liu

Recommended books and references (scientific journals, reports...)	Research in research engines specialized in scientific research such as: • Google scholar • Science direct • IEEE.
Electronic References, Websites	Here's a summary of important URLs related to t book: https://www.coursera.org/learn/ signals and system fundamentals

ENGLISH LANGUAGE

1. Course Name: ENGLISH LANGUAGE
2. Course Code: GU31
3. Semester / Year: Semester 2 \ 2024-2025
4. Description Preparation Date: 01/10/2024
5. Available Attendance Forms: Offline, In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours of study in the classroom / 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: - Email: -
8. Course Objectives

Course Objectives	The main purpose of the course is to provide knowledge about the English language, improve communication skills in English, improve critical writing skills, increase literary skills, explain the principal types of grammar, make it capable to evaluate and analyses sentences. Student taking this course spend their time reading scientific essays, and both pieces of science. Student will be able to communicate in a Basic English medium with hi friends. Along with this, in this English course, various types of activities including team work and seminar are also added to its curriculum studies. In addition to that, students w respond to English activity with thoughtful formal and informal speaking .Students will explore the power of grammar through the study of the spoken word. Students will read silently at varying speeds depending on the purpose of reading; adopt different strategies for different types of text; recognize the organization of a text. This course, the student w does this course helps a lot in reading English, getting information about English, increase his speaking speed in English, and writing English. 1- To enable the learner to communicate effectively and appropriately in real-life situatio 2- To use English effectively for study purposes across the curriculum. 3- To develop and integrate the use of the two language skills, i.e., listening, speaking. 4- To develop interest in and appreciation of literature. 5- To revise and reinforce structures already learnt. 6- To basically translate from English to Arabic and vice versa

9. Teaching and Learning Strategies

Strategy	A. Cognitive goals The student will learn the basic and applied concepts of the following fundamentals: A1. Students will develop a foundational understanding of virtual memory once including demand paging, copy-on-write, and page replacement algorithms. A2. Learners will become familiar with different storage management techniques, such disl scheduling and RAID structures, and their application in various operating syst environments. A3. The course will equip students with problem-solving strategies for managing process and deadlocks, enhancing their ability to handle operating system challenges effectively. B. The skills goals special to the course of operating system: B1. Equip students with advanced knowledge and skills in operating system des emphasizing virtual memory, mass-storage systems, and file system implementation. B2. Enable students to devise accurate and effective solutions to complex operating syst issues with a particular focus on deadlocks, memory management, and storage strategies B3. Enhance the students' engineering acumen and broaden their understanding of operate system applications, including process synchronization, file system security, and mem allocation techniques

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical	A1, B1, C1	Grammer (1) (Naming tenses :present , past , future) , Auxiliary verbs	In class	In class activities
Week 2	2 Theoretical	A1, B1, C1	Everyday English (Everyday situations)	In class	In class activities and home duties
Week 3	2 Theoretical	A1, B1, C1	Grammer (2) :Present tenses(present simpl , present continuous (have and have got)	In class	In class activities
Week 4	2 Theoretical	A2, B2, C2	Everyday English (Making conversation)	In class	In class activities
Week 5	2 Theoretical	A2, B2, C2	Grammer(3) Past tenses (past simple , past continuous)	In class	In class activities and home duties
Week 6	2 Theoretical	A2, B2, C2	Vocabulary (Positive and negative adjectives)	In class	In class activities and home duties
Week 7	2 Theoretical		Everyday English (Giving opinion)	In class	In class activities and home duties
Week 8	2 Theoretical	A3, B3, C3	Everyday English (Polite Requests and offers	In class	Quiz 1
Week 9	2 Theoretical	A3, B3, C3	Everyday English (Polite Requests and offers	In class	Questions during the lecture

Week 10	2 Theoretical	A3, B3, C3	Grammer (4): Advice, obligation, and permission	In class	Home duties and questions during the lecture
Week 11	2 Theoretical	A3, B3, C3	Everyday English (Polite Requests and offers	In class	Mid Term
Week 12	2 Theoretical	A4, B4, C4	Grammer (5) : future forms , future possibilities	In class	Quiz 2
Week 13	2 Theoretical	A4, B4, C4	Vocabulary : Phrasal verb (literal , Idiomatic)	In class	In class activities
Week 14	2 Theoretical	A4, B4, C4	Everyday English making suggestions	In class	Assignment Presentation
Week 15	2 Theoretical	A4, B4, C4		In class	In class activities
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ..... etc

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	New Headway of Oxford / Intermediate / Student's Book Fourth edition
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Research in research engines specialized in scientifi research such as: • Google scholar • Science direct • IEEE.
Electronic References, Websites	

Database System

1. Course Name: Database System
2. Course Code: COE32207
3. Semester / Year: Semester 1 \ 2024-2025
4. Description Preparation Date: 2025-1-27
5. Available Attendance Forms: Offline, In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours of study in the classroom / 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: - Email: -

8. Course Objectives	
Course Objectives	The aim of teaching a computer graphics subject is multifaceted: to develop a str foundation in fundamental principles, algorithms, and techniques; enhance practical through hands-on experience with graphics software and programming languages; of creativity and innovation in designing graphics solutions; promote critical thinking problem-solving in complex graphics scenarios; prepare students for careers in induct like animation, gaming, and virtual reality; encourage research, innovation, and contribute to the field; and emphasize ethical considerations such as privacy, security, and b Ultimately, the goal is to empower students with the knowledge, skills, and ethical aware needed to excel in computer graphics and make impactful contributions to both industry academia.

9. Teaching and Learning Strategies	
Strategy	Understand the fundamental concepts of databases, including data models, schemas, query languages. Design normalized relational database schemas. Implement and manipulate databases using SQL (Structured Query Language). Analyze optimize database performance. Understand the principles of database security and integrity. Gain familiarity with emerging trends in database systems, such as NoSQL databases and data technologies.

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method

Week 1	2 Theoretical	A1, B1, C1	• Overview of Database Systems • Importance of Databases in Modern Computing • Evolution of Database Technology • Comparison of File- Based Systems vs. Database Systems • Role of Database Management Systems (DBMS)	In class	In class activities
Week 2	2 Theoretical	A1, B1, C1	• Introduction to the Relational Data Model • Entity-	In class	In class activities and home duties
			Relationship Modeling • Normalization • Introduction to SQL Data Definition Language (DDL) in SQL		
Week 3	2 Theoretical	A1, B1, C1	• Data Manipulation Language (DML) in SQL • Queries: Retrieval and Manipulation of Data SQL Joins and Aggregation	In class	In class activities
Week 4	2 Theoretical	A2, B2, C2	• Overview of Database Systems • Importance of Databases in Modern Computing • Evolution of Database Technology • Comparison of File- Based Systems vs. Database Systems • Role of Database Management Systems (DBMS)	In class	In class activities

Week 5	2 Theoretical	A2, B2, C2	• Introduction to the Relational Data Model • Entity-Relationship Modeling • Normalization • Introduction to SQL Data Definition Language (DDL) in SQL	In class	In class activities and home duties
Week 6	2 Theoretical	A2, B2, C2	• Data Manipulation Language (DML) in SQL • Queries: Retrieval and Manipulation of Data SQL Joins and Aggregation	In class	In class activities and home duties
Week 7	2 Theoretical		-Raster scan	In class	In class activities and home duties
Week 8	2 Theoretical	A3, B3, C3	• Principles of Relational Database Design • Functional Dependencies • Normalization (First Normal Form to Boyce- Codd Normal Form) • Entity-Relationship Diagrams Mapping E-R Diagrams to Relational Schemas	In class	Quiz 1
Week 9	2 Theoretical	A3, B3, C3	• Overview of Database Architecture • Physical Database Design • Transaction Management • Concurrency Control Database Security and Integrity	In class	Questions during the lecture

Week 10	2 Theoretical	A3, B3, C3	• Query Processing Phases • Cost-Based Opti mization Techniques • Indexing and its Impact on Query Performance Improving Query Performance: Query Tuning Strategies	In class	Home duties and questions during the lecture
Week 11	2 Theoretical	A3, B3, C3	• Object-Oriented and Object- Relational Databases • NoSQL Databases: Types and Use Cases • Big Data Technologies and Their Impact on Database Systems • Emerging Trends in Database Research and Industry • Implementation of a Database Project • Project Presentation and Evaluation • Review Sessions to Consolidate Learning	In class	Mid Term
			Preparation for Exams and Assignments		
Week 12	2 Theoretical	A4, B4, C4	• Principles of Relational Database Design • Functional Dependencies • Normalization (First Normal Form to Boyce- Codd Normal Form) • Entity-Relationship Diagrams Mapping E-R Diagrams to Relational Schemas	In class	Quiz 2
Week 13	2 Theoretical	A4, B4, C4	• Overview of Database Architecture • Physical Database Design • Transaction Management • Concurrency Control Database Security and Integrity	In class	In class activities

Week 14	2 Theoretical	A4, B4, C4	• Query Processing Phases • Cost-Based Opti mization Techniques • Indexing and its Impact on Query Performance Improving Query Performance: Query Tuning Strategies	In class	Assignment Presentation
Week 15	2 Theoretical	A4, B4, C4	• Object-Oriented and Object- Relational Databases • NoSQL Databases: Types and Use Cases • Big Data Technologies and Their Impact on Database Systems • Emerging Trends in Database Research and Industry • Implementation of a Database Project • Project Presentation and Evaluation • Review Sessions to	In class	In class activities
			Consolidate Learning Preparation for Exams and Assignments		
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	•braham Silberschatz, Henry F. Korth, and Sudarshan, Database System Concepts, Sixth Editi 2006
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Research in research engines specialized in scientific research such as: • Google scholar • Science direct • IEEE.
Electronic References, Websites	https://db-book.com/slides-dir/index.html

Control System

1. Course Name: Control System
2. Course Code: COE31206
3. Semester / Year: Semester 1 \ 2024-2025
4. Description Preparation Date: 01/10/2024
5. Available Attendance Forms: Offline, In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours of study in the classroom / 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: - Email: -

8. Course Objectives

Course Objectives	• Provides a background of control principles in various engineering applications • Use Basic mathematical tools such as Laplace transform, transfer function, bl diagram, signal flow graph, mathematical modeling of dynamic systems, time respond analysis, stability of linear system, root locus, and, frequency domain analysis are utilize • Design and implement Controllable and observable system. • Study the stability of linear systems.

9. Teaching and Learning Strategies

Strategy	The student will learn the basic and applied concepts of probability and statics with the following fundamentals: A1. The student acquires a general definition of probability and the possibility of applyi it in other sciences, scientifically and humanly A2. Studying the methods and methods used in solving questionnaires and analyzing problems about principles of counting. A3. Enable the student to understand the content of probability and how it overlaps wit the rest of the sciences A4. Identify the odd and common marginal functions A5. Understanding the types of probability and how to differentiate between it. A6. Identifying the discontinuous and continuous variables and how to deal with each o them. A7. Studying the statistical measures, relation between them and how we applicate it w respect to real problems

	A8. Studying the statistical distributions with respect to types of variables and applicate the measures on it. A9. Studying the relation between x & y according to correlation coefficient of joint probability distribution. B. The skills goals special to the course of probability B1. The possibility of predicting life issues and their behavior in the future or in the pas B2. The possibility of using probabilistic measures to solve the probability distributions the samples and the population B3. The ability to relate vital issues to possibility and to find possible solutions to them, or hypothetical

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical	A1, B1, C1	Introduction to control systems	In class	In class activities
Week 2	2 Theoretical	A1, B1, C1	Open and Close system	In class	In class activities and home duties
Week 3	2 Theoretical	A1, B1, C1	Transfer function concept and Block Diagram reduction	In class	In class activities
Week 4	2 Theoretical	A2, B2, C2	Feedback system	In class	In class activities
Week 5	2 Theoretical	A2, B2, C2	Study Linear systems and its Transfer Function (RLC circuit and AC motor)	In class	In class activities and home duties
Week 6	2 Theoretical	A2, B2, C2	Block Diagram Algebra	In class	In class activities and home duties
Week 7	2 Theoretical		Signal flow graphs and Mason's signal-flow Graph Models	In class	In class activities and home duties
Week 8	2 Theoretical	A3, B3, C3	Mid Exam	In class	Quiz 1
Week 9	2 Theoretical	A3, B3, C3	Stability of system & Transient Response stability	In class	Questions during the lecture
Week 10	2 Theoretical	A3, B3, C3	Steady State error	In class	Home duties and questions during the lecture
Week 11	2 Theoretical	A3, B3, C3	Routh's Hurwitz stability	In class	Mid Term
Week 12	2 Theoretical	A4, B4, C4	State Transition Matrix	In class	Quiz 2
Week 13	2 Theoretical	A4, B4, C4	Root Locus and zero-pole placement	In class	In class activities

Week 14	2 Theoretical	A4, B4, C4	PID Controller	In class	Assignment Presentation
Week 15	2 Theoretical	A4, B4, C4	Comprehensive semester exam	In class	In class activities
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ..... etc

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	• Richard C. Dorf and Robert H. Bishop ”Mode Control Systems”. • Katsuhiko Ogata “Modern cont engineering”, 5th edition.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Research in research engines specialized in scienti research such as: • Google scholar • Science direct • IEEE.
Electronic References, Websites	

Computer Graphics

1. Course Name: Computer Graphics	
2. Course Code: COE31205	
3. Semester / Year: Semester 1 \ 2024-2025	
4. Description Preparation Date: 01/10/2024	
5. Available Attendance Forms: Offline, In class	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours per week / 30 hours of study in the classroom / 2 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: - Email: - lina.t.sultan@gu.edu.iq	
8. Course Objectives	
Course Objectives	The aim of teaching a computer graphics subject is multifaceted: to develop a str foundation in fundamental principles, algorithms, and techniques; enhance practical skill through hands-on experience with graphics software and programming languages; of creativity and innovation in designing graphics solutions; promote critical thinking problem-solving in complex graphics scenarios; prepare students for careers in induct like animation, gaming, and virtual reality; encourage research, innovation, and contribute to the field; and emphasize ethical considerations such as privacy, security, and b Ultimately, the goal is to empower students with the knowledge, skills, and ethical aware needed to excel in computer graphics and make impactful contributions to both industry academia.
9. Teaching and Learning Strategies	

Strategy	A1. The Student learns basic and applied concepts of computer graphics. A2. The student learns how to use computer graphics in various fields, medical, arts others. A3. The student learns difference between interactive and non-interactive display device A4. The student understands and distinguishes between the vector graphic and graphic A5. The Student studies various techniques used in computer display devices. A6. The student applies algorithms for vector drawing. A7. The Student studies and applies techniques for transformation on 2D and 3D graphic A8. The student learns the windowing and clipping techniques A9. The Student learns to analysis composite transformation problem and designs a solute A10. The Student learns visual basic.net for manipulation generating graphic manipulating them. B. The skills goals special to the course. B1. Development of student skill in memorization and retrieval, understanding distinction between different technologies. B2. The student has a knowledge skill on calculating, analyzing and generating vectors, ci and various 2D, 3D graphics. B3. The student can find appropriate and correct solutions for complex real problem B4 Development of engineering and intellectual sense and expansion of student concepts the use of computer graphics in computer engineering. B5. Analysis and Design solution for real world graphic problem and games. B6 - Develop animation programs and graphical interface using VB. Net.

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical	A1, B1, C1	Introduction to computer graphic and its applications	In class	In class activities
Week 2	2 Theoretical	A1, B1, C1	-Interactive and non- interactive graphic system	In class	In class activities and home duties
Week 3	2 Theoretical	A1, B1, C1	-Vector graphic vs raster graphic	In class	In class activities
Week 4	2 Theoretical	A2, B2, C2	Graphic display system	In class	In class activities

Week 5	2 Theoretical	A2, B2, C2	-CRT	In class	In class activities and home duties
Week 6	2 Theoretical	A2, B2, C2	-Random scan	In class	In class activities and home duties
Week 7	2 Theoretical		-Raster scan	In class	In class activities and home duties
Week 8	2 Theoretical	A3, B3, C3	-direct storage tube	In class	Quiz 1
Week 9	2 Theoretical	A3, B3, C3	-PLASMA	In class	Questions during the lecture
Week 10	2 Theoretical	A3, B3, C3	LCD	In class	Home duties and questions during the lecture
Week 11	2 Theoretical	A3, B3, C3	Vector drawing	In class	Mid Term
Week 12	2 Theoretical	A4, B4, C4	Line drawing	In class	Quiz 2
Week 13	2 Theoretical	A4, B4, C4	DDA algorithm	In class	In class activities
Week 14	2 Theoretical	A4, B4, C4	Circle drawing	In class	Assignment Presentation
Week 15	2 Theoretical	A4, B4, C4	-Bresenham algorithm	In class	In class activities
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ..... etc

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	• Computer graphic C version ", Donald Hurn, Pauline Baker, 2ed ed.
Main references (sources)	Computer Graphics: principles and practice" Jhon Hughus, 3ed ed (2014).
Recommended books and references (scientific journals, reports...)	Research in research engines specialized in scientific research such as: • Google scholar • Science direct • IEEE.
Electronic References, Websites	http://www.cgbreak.com/news/articles/

Numerical Analysis

1. Course Name:
Numerical Analysis
2. Course Code:
COE32201
3. Semester / Year:
Stage 3 - Second Course
4. Description Preparation Date:
2025-1-27
5. Available Attendance Forms:
Weekly - Theoretical & practical
6. Number of Credit Hours (Total) / Number of Units (Total)
units20 hr \ 3
7. Course administrator's name (mention all, if more than one name)
Name: aya.a. kadhim Email: aya.a.kadhim@gu.edu.iq

8. Course Objectives	
Course Objectives	erall, numerical analysis in engineering aims to give dents and professionals the tools and knowledge they need to apply mathematical nciples effectively in their work, to develop and use nterpret the results correctly and numerical methods, and meaningfully.

9. Teaching and Learning Strategies	
Strategy	dent acquiring a general definition of numerical analysis and how to apply it in er sciences, studying the numerical methods used in the solutions of differential ations and linear and nonlinear systems, being able to deal with functions and their ivatives and integrals in an integrated analytical context, the ability to link vital ics to numerical analysis and find potential solutions for them, real or hypothetical

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	lerstand the principles of Numerical Analysis	rature review, errors , ts finding (Bisection / vton – Raphson) methods	1.Foundational Knowledge ctures & Reading) 2.Practical lication and Design(Labs, Simulations, Projects) 3. Active rning and Reinforcement 4.Blended Approach	• Quizzes • Assignments • In-class Participati
2		ly numerical methods	ts finding (Secant / Fixed point) methods		
3		Error Analysis	Curve Fitting		
4		Computational Tools	st square regression line		
5		lement Numerical Algorithms:	rpolation: Newton (wards , Backwards , divided differences)		
6		rpret and Evaluate Results	Interpolation		
7		del Real-world Engineering Problems	Interpolation		
8		ign and Conduct Experiments	Mid exam		
9			merical Differentiation		
10			nerical Solutions of ODE's		
11			nerical Solutions of Linear Systems		
12			uss – elimination , Gauss – Seidel		
13			nerical Solutions of Linear Systems		
14			Term exam + tutorial		
15			paratory week before the final Exam		

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

quired textbooks (curricular books, if any)	1-Advanced engineering mathematics by Erwin Krizge
Main references (sources)	1. Numerical methods by Babu Ram. 2. Applied mathematics journals, schaum series in numer analysis
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Digital Signal Processing

1. Course Name: Digital Signal Processing
2. Course Code: COE32203
3. Semester / Year: Semester 2 \ 2024-2025
4. Description Preparation Date: 27-1-205
5. Available Attendance Forms: Offline, In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours of study in the classroom / 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: - Email: - dunya.zeki@gu.edu.iq
8. Course Objectives

Course Objectives	1. A Digital Signal Processing (DSP) course aims to provide students with the knowledge and practical skills to analyze and manipulate digital signals. Focusing techniques and algorithms, the course covers applications in areas like audio processing telecommunications. Students learn to design digital filters, analyze signals in time frequency domains, and use DSP tools. The overarching goal is to equip students to apply concepts effectively in solving real-world problems and contributing to technology advancements.
9. Teaching and Learning Strategies	
Strategy	A. Cognitive goals The student will learn the basic and applied concepts of Digital Signal processing with following fundamentals:

	A.1. Understand the fundamentals of signal sampling. A.2. Express the concepts of Discrete signals and systems and their different types which be used in a wide variety of disciplines in engineering. A.3. Identify and report system properties such as causality, stability, linearity, and t invariance etc. A.4. Apply the convolution sum formulas to determine the output of discrete time system A.5. Understand and resolve the Discrete time signals in frequency domain using Fou series and Fourier transforms, and Fast Fourier Transform. A.6. Understand the concept of z-transform and its and develop the ability to analyze system in z- domain. A.7. Understand the concept of digital filter design and develop the ability to design felt using different methods. B. The skills goals special to the course B.1 Develop a solid foundation in the fundamental concepts of signal processing, include time and frequency domain analysis, sampling, and quantization. B.2 Acquire the ability to design, analyze, and implement digital signal processing algorithm for applications such as filtering, modulation, and spectral analysis. B.3 Enhance mathematical skills, particularly in areas such as linear algebra, calculus, complex analysis, which are foundational to DSP. B.4 Develop problem-solving skills and critical thinking to analyze and address challenge signal processing applications. B.5 Gain proficiency in programming languages commonly used in DSP, such as MATL Python, or C/C++, for implementing and simulating DSP algorithms. B.6 Learn to design and analyze digital filters, including understanding the characteristic different filter types and their applications in signal processing. B.7. Understand the frequency domain representation of signals and systems, including Fourier transform, Discrete Fourier Transform (DFT), and Fast Fourier Transform (FFT). B.8. Apply DSP skills to real-world engineering problems, such as audio and mi processing, communications, biomedical signal processing, and control systems. B.9. Gain an understanding of hardware considerations and constraints in implementing algorithms, including knowledge of digital signal processors (DSPs) and other hard platforms.

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical	A1, B1, C1	Fundamental Concepts of Discrete Signals and Systems - Introduction	In class	In class activities
Week 2	2 Theoretical	A1, B1, C1	Sampling of continuous-time signals: the sampling theorem, Aliasing, Nyquist rate.	In class	In class activities and home duties
Week 3	2 Theoretical	A1, B1, C1	Discrete time signal types and operations on Discrete time signals.	In class	In class activities
Week 4	2 Theoretical	A2, B2, C2	Discrete time system types and properties.	In class	In class activities
Week 5	2 Theoretical	A2, B2, C2	Discrete time System Impulse response Evaluation	In class	In class activities and home duties

Week 6	2 Theoretical	A2, B2, C2	Discrete time System convolution (Graphical method, Table method, mathematical method)	In class	In class activities and home duties
Week 7	2 Theoretical		Mid-term Exam	In class	In class activities and home duties
Week 8	2 Theoretical	A3, B3, C3	Introduction to Discrete Fourier Series and its properties	In class	Quiz 1
Week 9	2 Theoretical	A3, B3, C3	Introduction to Discrete Fourier Transform and its properties	In class	Questions during the lecture
Week 10	2 Theoretical	A3, B3, C3	Fast Fourier Transform (FFT)	In class	Home duties and questions during the lecture
Week 11	2 Theoretical	A3, B3, C3	Introduction to Z-transform and its properties.	In class	Mid Term
Week 12	2 Theoretical	A4, B4, C4	Z-plane poles and zeros	In class	Quiz 2
Week 13	2 Theoretical	A4, B4, C4	Digital FIR Filter Analysis and design	In class	In class activities
Week 14	2 Theoretical	A4, B4, C4	Digital IIR Filter Analysis and design - Butterworth Analog Filters	In class	Assignment Presentation
Week 15	2 Theoretical	A4, B4, C4	Digital IIR Filter Analysis and design - Cheby-Chev Analog Filters	In class	In class activities
Week 16	3 hrs.		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ..... etc

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	Digital Signal Processing: Principles, Algorithms, an Applications Author: John G. Proakis and Dimitris G. Manolakis Publisher: Pearson Publishing year: 2017
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Research in research engines specialized in scientific research such as: • Google scholar • Science direct • IEEE.

Electronic References, Websites	a summary of important URLs related to this book: • MIT Open Courseware - Digital Signal Processing • DSPRelated

Microprocessor Application

1. Course Name: Microprocessor Application
2. Course Code: COE32202
3. Semester / Year: Semester 2 \ 2024-2025
4. Description Preparation Date: 01/10/2024
5. Available Attendance Forms: Offline, In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours of study in the classroom / 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: - Email: - lina.t.sultan@gu.edu.iq
8. Course Objectives

Course Objectives	1- enabling the student to write a code in assembly language for interfacing 2- Enabling the student to connect and control the LED 3- Enabling the student to connect and control the 7-segment 4- Enabling the student to connect and control the stepper motor
9. Teaching and Learning Strategies	
Strategy	The student will learn the basic and applied concepts of Microprocessor application w the following fundamentals: A.1. enabling the student to write a code in assembly language for interfacing A.2. Enabling the student to connect and control the LED

	A.3. Enabling the student to connect and control the 7-segment A.4. Enabling the student to connect and control the stepper motor A.5. Enabling the student to connect and rotate the stepper motor A.6. Using Switches As Input To Control Mechanical Press A.7. Generating Sine Wave Using DAC

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical		Representing Binary Code With LED Array	In class	In class activities
Week 2	2 Theoretical		Representing BCD Code With LED Array	In class	In class activities and home duties
Week 3	2 Theoretical		Seven Segment Interfacing	In class	In class activities
Week 4	2 Theoretical		Square Traffic Light	In class	In class activities
Week 5	2 Theoretical		Light Detected Resistor (LDR).	In class	In class activities and home duties
Week 6	2 Theoretical		IC Tester	In class	In class activities and home duties
Week 7	2 Theoretical		Stepper Motor	In class	Mid Term
Week 8	2 Theoretical		Mid-course Exam	In class	In class activities & Quiz
Week 9	2 Theoretical		Rotate The Stepper Motor Bidirectional	In class	In class activities & Questions during the lecture
Week 10	2 Theoretical		Reading Switches Status And Output To Leds	In class	In class activities & Questions during the lecture
Week 11	2 Theoretical		Using Switches As Input To Control Mechanical Press	In class	In class activities
Week 12	2 Theoretical		Converting Analogue Input (Variable Pot) To Digital	In class	In class activities
Week 13	2 Theoretical		Generating Sine Wave Using DAC	In class	In class activities
Week 14	2 Theoretical		Motor Control, Temperature Control	In class	In class activities
Week 15	2 Theoretical		Representing Binary Code With LED Array	In class	In class activities
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ..... etc

12. Learning and Teaching Resources

Required textbooks (curricular books any)	• Barry B. Brey "The Intel Microprocess 8th Edition" • Triebel, Walter A. "The 8088 and 80 microprocessors: Programming, interface software hardware, and applications: include the 80286, 80386, 80486, and Pentium proces families". 4th ed. Pearson, 2003.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Here's a summary of important URLs related this book: https://www.coursera.org/learn/

Computer Networks

1. Course Name: Computer Networks
2. Course Code: COE32204
3. Semester / Year: Semester 2 \ 2024-2025
4. Description Preparation Date: 01/10/2024
5. Available Attendance Forms: Offline, In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours of study in the classroom / 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: - Email: -
8. Course Objectives

Course Objectives	The aim of this course is to develop an understanding of the basic ideas of computer network create a reliable, efficient, and secure infrastructure that enables seamless communicate resource sharing, and collaboration in today's interconnected world.

9. Teaching and Learning Strategies

Strategy	Cognitive goals The student will learn the basic and applied concepts of Software Engineering with the follow fundamentals: A.1. Understanding Network Concepts OSI model, TCP/IP protocol, routing, switching, subnetting. A.2. Analyzing Network Protocols: Learners should be able to analyze and evaluate differ network protocols, including their functions, advantages, and limitations. A.3. Identifying network problems, diagnosing the root causes, and implementing appropriate solutions. Critical thinking and analytical skills are crucial in this aspect. A.4. Understanding network topology, addressing schemes, subnetting, VLANs, and secure considerations. A.5. Understanding Network Security, including encryption, authentication, access con firewalls, intrusion detection/prevention systems, and best practices for securing networ against threats. A.6. Understanding factors bandwidth, latency, jitter, and packet loss. This involves identif performance bottlenecks and implementing strategies to improve network efficiency. A.7. Staying Updated with Emerging Technologies: As technology evolves, it's important students to stay updated with emerging network technologies such as Software-Defi Networking (SDN), Network Functions Virtualization (NFV), Internet of Things (IoT), and networks. A.8. Understand Symmetric _key Algorithms. B. The skills goals special to the course of Computer Networks B.1. proficient in configuring network devices such as routers, switches, firewalls, and ac points. This includes tasks such as setting IP addresses, configuring routing protocols, creat VLANs, and implementing security policies. B.2. Develop strong troubleshooting skills to diagnose and resolve network issues efficient B.3. Ability to capture and analyze network traffic using packet capture tools such Wireshark. B.4. Acquire skills in implementing various network security measures to protect agai unauthorized access, data breaches, and other cyber threats. B.5. Design network architectures that meet specific requirements and constraints. includes determining network topology, selecting appropriate hardware and soft components designing IP addressing schemes, and considering scalability and redundant requirements. B.6. Gain skills in designing, configuring, and securing wireless networks. This include understanding wireless standards, configuring access points, optimizing signal strength coverage, and implementing encryption and authentication mechanisms. B.7. Develop and manage network resources in virtualized and cloud environments. B.8. Develop skills in documenting network configurations, procedures, and policies. includes creating network diagrams, writing technical documentation, and generating report network performance and security. B.9. Articulate technical concepts clearly and work collaboratively to solve complex network problems.

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical	A1, B1, C1	Fundamental Concepts Computer	In class	In class activities
Week 2	2 Theoretical	A1, B1, C1	Networks - Introduction	In class	In class activities and home duties
Week 3	2 Theoretical	A1, B1, C1	PHYSICAL AND DATA LINK	In class	In class activities
Week 4	2 Theoretical	A2, B2, C2	Network Architecture, OSI Vs TCP	In class	In class activities
Week 5	2 Theoretical	A2, B2, C2	Network hardware architecture: topologies, devices.	In class	In class activities and home duties
Week 6	2 Theoretical	A2, B2, C2	Introduction to types of networks - Optical Networks,	In class	In class activities and home duties
Week 7	2 Theoretical		Sensor networks.	In class	In class activities and home duties
Week 8	2 Theoretical	A3, B3, C3	PHYSICAL AND DATA LINK	In class	Quiz 1
Week 9	2 Theoretical	A3, B3, C3	LAYERS: Basics for Data communications, Transmission Media	In class	Questions during the lecture
Week 10	2 Theoretical	A3, B3, C3	IEEE 802 standards and LAN technologies – Ethernet, token ring – hardware addressing - Network layer design issues - Routing Algorithms - Congestion Control Algorithms-	In class	Home duties and questions during the lecture
Week 11	2 Theoretical	A3, B3, C3	Internetworking	In class	Mid Term
Week 12	2 Theoretical	A4, B4, C4	TRANSPORT LAYER:	In class	Quiz 2
Week 13	2 Theoretical	A4, B4, C4	Transport services - Elements of transport Protocols - A simple transport	In class	In class activities
Week 14	2 Theoretical	A4, B4, C4	Protocols –UDP –TCP	In class	Assignment Presentation
Week 15	2 Theoretical	A4, B4, C4	- Performance issues.	In class	In class activities
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports..... etc

12. Learning and Teaching Resources	
Required textbooks (curricular boo if any)	Andrew S. Tanenbaum, "Computer Networks", Pears Fourth Edition, 2010. 2. James F. Kurose and Keith W. Ross, "Compu Networking: A Top- Down
Main references (sources)	• Approach Featuring the Internet", Pears Education, Fourth Edition 2011.
Recommended books and references (scientific journals, reports...)	Research in research engines specialized in scientific research such as: • Google scholar • Science direct • IEEE.
Electronic References, Websites	1. Computer_Networking_A_Top-Down_Approach, James F. Kurose University of Massachusetts, Amhe Keith W. Ross Polytechnic Institute of NYU 2. Computer Networking: Beginner's guide Mastering Computer Networking and the OSI Mo (Computer Networking Series Book 1) 3. Computer Networks 5th By Andrew S. Tanenba (International Economy Edition) Paperback – January 2010 4. https://www.netacad.com/ 5. https://earthlink.iepn.iq/admin

Digital Control Systems

1. Course Name: Digital Control Systems
2. Course Code: COE32207
3. Semester / Year: Semester 2 \ 2024-2025
4. Description Preparation Date: 01/10/2024
5. Available Attendance Forms: Offline, In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours of study in the classroom / 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: - Email: -
8. Course Objectives

Course Objectives	• Digital control systems refer to systems where the control and manipulation signals and data are done using digital techniques. These systems are widely used in vary industries including aerospace, automotive, robotics, industrial automation, and more. • The subject of digital control systems encompasses the study of the theory, analyze and design of such systems. It involves understanding concepts from control theory applying them in the digital domain.

9. Teaching and Learning Strategies

Strategy	A1. Introduction to Digital Control Systems A2. Understanding of Digital Control System Principles: Students will gain a s understanding of the fundamental principles of control systems, including concepts such feedback, stability, and system performance metrics. A3. Analysis of Continuous-time and Discrete-time Systems: Students will learn how analyze both continuous-time and discrete-time control systems. They will understand differences between the two and be able to convert between continuous-time and disc time representations. A4. Design and Implementation of Digital Controllers: Students will learn vary methods fo designing digital controllers, including techniques such as transfer function representation state-space representation, and frequency response methods. They will able to desig controllers that meet desired performance specifications. A5. Simulation and Modeling: Students will gain proficiency in using software tools simulations to model and analyze digital control systems. They will learn how to Simulation system behavior, perform stability analysis, and evaluate system performance. A6. System Identification: Students will learn techniques for system identification, why involve determining the mathematical models of control systems based on input-output d They will understand methods such as least squares estimation and parameter identification A7. Stability Analysis: Students will learn how to analyze the stability of digital con systems, including methods such as root locus, Nyquist stability criterion, Jury test and B plots They will be able to determine the stability of a system and design controllers achieve. A8. System Performance Evaluation: Students will learn how to evaluate the Perform of digital control systems, including criteria such as rise time, settling time, overshoot, steady-state error. They will be able to analyze and optimize system performance. B. The skills goals special to the course of Digital Control Systems B.1. Understand digital control systems and their basic concepts B.2. : Revision of Z-Transform B.3. : Implement Discrete State Space Model Representation & Stability Tests for Discr in-Time Systems B.4. : Understand linear systems and its Transfer Function DC motor

	B.5. : Solve closed-loop transfer function in Z-Transform model. B.6. : Learn Digital Implementation of analog system. B.7. : Design Digital PID Control system. B.8. : Modeling of Digital Control Systems (ADC model & ADC model) and ZOH. B.9. : Design of Sampled-Data Control Systems. B.10. : Understand the Jury Test. B.11. : Understand Nyquist. B.12. : Analysis Performance measures (overshoot, peak time, response time etc.). B.13. : Implement Stability conditions – Asymptotic stability. B.14. : Implement the Stability conditions – BIBO stability and Internal stability. B.15. : Assess controllability and observability to meet requirements.

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical	A1, B1, C1	Introduction to Digital Control	In class	In class activities
Week 2	2 Theoretical	A1, B1, C1	Revision of Z-Transform	In class	In class activities and home duties
Week 3	2 Theoretical	A1, B1, C1	Discrete State Space Model Representation & Stability Tests for Discrete-in-Time Systems	In class	In class activities
Week 4	2 Theoretical	A2, B2, C2	Linear systems and its Transfer Function DC motor	In class	In class activities
Week 5	2 Theoretical	A2, B2, C2	Closed-loop transfer function in Z-Transform model	In class	In class activities and home duties
Week 6	2 Theoretical	A2, B2, C2	Digital Implementation of analog system	In class	In class activities and home duties
Week 7	2 Theoretical		Digital PID Control system	In class	In class activities and home duties
Week 8	2 Theoretical	A3, B3, C3	Mid Exam	In class	Quiz 1
Week 9	2 Theoretical	A3, B3, C3	Modeling of Digital Control Systems (ADC model & ADC model) and ZOH	In class	Questions during the lecture
Week 10	2 Theoretical	A3, B3, C3	Design of Sampled-Data Control Systems	In class	Home duties and questions during the lecture
Week 11	2 Theoretical	A3, B3, C3	Jury Test	In class	Mid Term
Week 12	2 Theoretical	A4, B4, C4	Nyquist	In class	Quiz 2
Week 13	2 Theoretical	A4, B4, C4	Performance measures (overshoot, peak time, response time etc.)	In class	In class activities

Week 14	2 Theoretical	A4, B4, C4	Stability conditions – Asymptotic stability	In class	Assignment Presentation
Week 15	2 Theoretical	A4, B4, C4	Stability conditions – BIBO stability and Internal stability	In class	In class activities
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.....etc

12. Learning and Teaching Resources

Required textbooks (curricular boo if any)	• Ogata: Discrete-Time Control Systems. Pears 2nd Edition, 2015. • M. Sami Fadali: Digital Control Engineeri Analysis and Design, Elsevier, 2nd Edition, 2012.
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Research in research engines specialized in scientific research such as: • Google scholar • Science direct • IEEE.
Electronic References, Websites	

Graphical User Interface (GUI)

1. Course Name: Graphical User Interface (GUI)
2. Course Code: COE32205
3. Semester / Year: Semester 2 \ 2024-2025
4. Description Preparation Date: 01/10/2024
5. Available Attendance Forms: Offline, In class
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours of study in the classroom / 2 unit
7. Course administrator's name (mention all, if more than one name)
Name: - Email: -

8. Course Objectives	
Course Objectives	The aim of this course is to enable the students to learn the techniques of the graphical u interface (GUI) programming. The focus will be on building robust client-side windows-ba applications that are useful in engineering and other disciplines. Students will quickly le how to program in Visual Basic .Net to construct interactive and user-friendly applications that solve real-world problems.

9. Teaching and Learning Strategies	
Strategy	A. Cognitive goals: A1. Enabling the student to acquire and understand the theoretical and fundamental concept of the Graphical User Interface (GUI) programming. A2. Enabling the student to acquire knowledge about GUI design technologies. A3. Enabling the student to acquire practical skills in developing effective, efficient and u friendly windows-based GUI applications for different purposes. B. The skills goals special to the course. B1. The student will acquire GUI design skills. B2. The student will acquire GUI programming skills. B3. The student will acquire scripting and editing skills, and error detection and correctio C. Affective and value goals C1. Developing the student's thinking and design skills to create high level GUI application C2. Creating the confidence of the students to use GUI programming to solve problems. C3. Encourage the students to the cooperative and team work. C4. Encourage the students to become innovative through competition.

10. Course Structure

The week	Hours	Required learning outcomes	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2 Theoretical	A1, B1, C1	Computer Programming Terminology	In class	In class activities
Week 2	2 Theoretical	A1, B1, C1	The Visual Basic Programming Language	In class	In class activities and home duties
Week 3	2 Theoretical	A1, B1, C1	The Visual Studio IDE	In class	In class activities
Week 4	2 Theoretical	A2, B2, C2	Enter Code and Comments in the Code Editor Window	In class	In class activities
Week 5	2 Theoretical	A2, B2, C2	Planning a Windows Forms Application	In class	In class activities and home duties
Week 6	2 Theoretical	A2, B2, C2	Windows Standards (Guidelines) for Interfaces	In class	In class activities and home duties
Week 7	2 Theoretical		Access Keys	In class	In class activities and home duties
Week 8	2 Theoretical	A3, B3, C3	Tab Order	In class	Quiz 1
Week 9	2 Theoretical	A3, B3, C3	Label Control	In class	Questions during the lecture
Week 10	2 Theoretical	A3, B3, C3	Text Box	In class	Home duties and questions during the lecture
Week 11	2 Theoretical	A3, B3, C3	Variables	In class	Mid Term
Week 12	2 Theoretical	A4, B4, C4	Selecting an Appropriate Data Type	In class	Quiz 2
Week 13	2 Theoretical	A4, B4, C4	Selecting an Appropriate Name	In class	In class activities
Week 14	2 Theoretical	A4, B4, C4	TryParse Method	In class	Assignment Presentation
Week 15	2 Theoretical	A4, B4, C4	Arithmetic Expressions	In class	In class activities
Week 16	3 hrs		**Final Exam**		Final Exam

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ..... etc

12. Learning and Teaching Resources	
Required textbooks (curricular boo if any)	Programming with Microsoft Visual Basic 2017, 8 Edition by Diane Zak, Cengage Learning 2018.
Main references (sources)	Visual Basic 2012 How to Program, 6th Edition by P Deitel Harvey M. Deitel, Abbey Deitel, Pears Education 2013.• "Fundamentals Of Databa Systems", ramez elmasri, shamkant b. navathe, seventh edition, 2016, ISBN-13: 978-0-13-397077-7
Recommended books and references (scientific journals, reports...)	Research in research engines specialized in scientific research such as: • Google scholar • Science direct • IEEE.
Electronic References, Websites	Here's a summary of important URLs related to t VB.Net Programming Tutor https://www.tutorialspoint.com/vb.net/index.htm Linked learning https://www.linkedin.com/learning/