جامعة المشرق

كلية علوم الحاسوب وتقانة المعلومات

College of Computer Science and Information Technology

برنامج
بكالريوس العلوم (درجة الشرف) في هندسة البرمجيات

A Proposal for the Bachelor of Science (Honors)Program in Software Engineering

مارس 2019

جامعة المشرق
كلية علوم الحاسوب وتقانة المعلومات
مقترح برنامج بكالريوس العلوم(درجة الشرف) في هندسة البرمجيات
A Proposal forthe Bachelor of Science (Honors) Program in Software
Engineering

اسم البرنامج:

باللغة العربية:بكالريوس العلوم (درجة الشرف) في هندسة البرمجيات
باللغة الانجليزية: Bachelor of Science (Honours) in Software Engineering

الدرجة التي تمنح:

باللغة العربية:بكالريوس العلوم (درجة الشرف) في هندسة البرمجيات
باللغة الانجليزية: Bachelor of Science (Honours) in Software Engineering
تمنح الدرجة بعد اكمال (165) ساعة معتمدة

تكوين اللجنة:

1. **د. عمر حاج علي حاج الحسن ــ دكتوراة تقنية المعلومات ــ رئيس الجامعة**
2. **د. وفاء فيصل مختار ــ دكتوراة علوم الحاسوب ــ استاذ مساعد**
3. **د. اميرة كامل ابراهيم ــ دكتوراة علوم الحاسوب ــ عميد الكلية**

أسلوب عمل اللجنة

عقدت اللجنة عدد من الاجتماعات لمناقشة تطوير البرنامج، واستعانت بآراء عدد من ذوي الاختصاص في مجال الحاسوب والمجالات الأخرى ذات العلاقة من داخل وخارج الجامعة، كما التزمت اللجنة بالتقرير الصادر من لجنة دراسات الحاسوب(الكلية الانموذج) والمرجعية التالية:

1. ACM (Association for Computing Machinery)
2. QAA (The Quality Assurance Agency for Higher Education)
3. IEEE(Institute of Electrical and Electronics Engineers)

بالاضافة الى ذلك اطلعت اللجنة على عدد من البرامج المشابهة في جامعات أخرى عبر شبكة المعلومات العالمية (الإنترنت) على المستوى المحلي والإقليمي و العالمي*.استعانت اللجنة أيضا بموجهات كلية الحاسوب الأنموذج الصادر من لجنة دراسات الحاسوب بوزارة التعليم العالي البحث العلميفي مايو 2017.

المقدمة

هندسة البرمجيات كما تعرفه جمعية IEEE هو مجال يهتم بدورة تطوير وانشاء البرمجيات والتي تتضمن كل من تحليل المتطلبات،والتصميم والبناء، والاختبار والصيانة ،وادارة اقتصاديات هندسة البرمجيات. يعد تخصص هندسة البرمجيات تخصصاً حديثاً نسبياً، ويتمحور بشكل أساسي حول تطبيق مبادئ علوم الحاسوب والرياضيات وهندسة البرمجيات لتحقيق حلول برمجية عالية الجودة و فعالة من حيث التكلفة لمشاكل برمجية بأسلوب منهجي ومنضبط وفعال.

في بيئة تطوير البرمجيات، مهندسي البرمجيات يستطيعون العمل في جميع مجالات بناء البرمجيات بما فيها: تحليل المتطلبات، التصميم، و ضمان الجودة والبرمجة وصيانتها. هذا ما يجعل تأقلمهم أسهل للعمل في معظم المجالات المتعلقة بتطوير البرمجيات. كل الصناعات بتعدد شركاتها ومؤسساتها في العالم اليوم تعتمد على الأنظمة البرمجية، مما يزيد من الطلب على تخصص هندسة البرمجيات. الشركات التي ترتكز على البرمجيات، والتي لها التأثير الأكبر في العالم تميل لاستخدام مبادئ هندسة البرمجيات، خصوصا مع تقدم البرمجيات مؤخراً وزيادة تعقيدها .

ويهدف البرنامج لتزويد الدارسين بالمهارات والمعرفة اللازمة لتولي المناصب المهنية المناسبة في هذا المجال بعد التخرج والترقي للمناصب القيادية أو متابعة البحث العلمي أو الدراسات العليا فيه.

رؤية البرنامج

بناء الشخصية العلمية العالية المستوى والقادرة على الإنتاج المتميز للبرمجيات الحديثة والمتطور أكاديمياً وتسطيع المنافسة في مجال البرمجيات

أهداف البرنامج

1. إعداد دارسين أكفاء في مجال علوم الحاسوب وهندسة البرمجيات.
2. الإسهام في توطين المعرفة والتكنولوجيا في البلادفي مجال دراسات الحاسوب.
3. تقديم الاستشارات في مجال هندسة البرمجيات.
4. المساهمة في تنمية المجتمع من خلال البحوث، وخدمات الإرشاد، وتبادل المعارف التقنية.
5. الإسهام في تطويرالأسس العلمية والرياضية والنظرية في مجالهندسة البرمجيات.

شروط القبول للبرنامج

1. حسب شروط القبول لمؤسسات التعليم العالي.
2. النجاح في الشهادة الثانوية أو ما يعادلها المساق الأكاديمي العلمي.

مخرجات البرنامج:

سيكون خريج هذا البرنامج قادر على:
- تصميم نظام أو مكون لتلبية الحاجات المطلوبة لبناء البرمجيات الحديثة
- استخدم التقنيات والأدوات الحديثة والضرورية في هندسة البرمجيات
- تحديد وصياغة المشاكل المتعلقة بهندسة وبنية البرمجيات
- التدريس بالجامعات والمعاهد العليا
- تفهم المسؤولية المهنية والأخلاقية

الفرص الوظيفية:

ستتوفر لخريجي برنامج هندسة البرمجيات فرص وظيفية متنوعة في صناعة البرمجيات وتقنية المعلومات، وتشمل هذه الفرص:
- مطور برمجيات
- مهندس معمارية البرمجيات
- مصمم برمجيات
- محلل نظم برمجيات
- مهندس فحص برمجيات
- مهندس ضمان جودة البرمجيات
- مهندس صيانة برمجيات
- مدير مشروع برمجيات

مصوغات الترفيع لدرجة الشرف

عملت كلية الحاسوب وتقانة المعلومات بجامعة المشرق وعلى مدى السنوات الماضية على تخريج دارسين يحملون درجة البكالريوس (العام) في هندسة البرمجيات، وتتقدم أمانة الشؤون العلمية بجامعة المشرق بالتعاون مع عمادة كلية الحاسوب وتقانة المعلومات بهذا المقترح لبرنامج بكالريوس الشرف في هندسة البرمجيات. وتماشيا مع سياسات التطوير التي تتبناها وزارة التعليم والبحث العلمي بتطوير المناهج والذي تمت فيها إضافة بعض الموضوعات الحديثة في مجال هندسة البرمجيات بالاضافة لتكملة الساعات المعتمدة لمتطلبات البرنامج لتزويد الطالب بمجالات المعرفة الحديثة.

<u>المطلوبات الدراسية:</u>

- مقررات أساسية.
- مقررات إختيارية.

- سمنــــــارات.
- مشروع التخـرج.

طرق التدريس:

- محاضرات.
- تمارين عملية (بمعامل الحاسوب).
- سمنـــارات.

نظام الدراسة ومدتها

أ. **نظام الدراسة:** نظام الساعات المعتمدة المتبع في الجامعة والموضح في اللائحة الاكاديمية

ب. **مدة الدراسة:** 4 سنوات موزعة على ثمانية فصول دراسيةومدة كل فصل دراسي15أسبوعاً لا تشمل الامتحانات.

لغة التدريس:

اللغة العربية واللغة الإنجليزية

طريقة الترميز :

يتكون رمز المقرر من ثلاثة خانات كما مبين بالجدول رقم (أ) ، اما رموز مجالات المعرفة من ثلاثة خانات تدل على اسم المجال ف جدول رقم (ب)

جدول رقم (أ) طريقة ترميز المقررات :

الخانات	1	2	3	4	5	6	7
مدلول الرمز		رمز مجال المعرفة	السنة الدراسية	الفصل الدراسي	ترتيب المقرر ضمن المجال		
مثال		حسب	3	2	04		

اما مشروع التخصص فمنح الرمز (هبر 444 - SE 444) لخصوصيتة وتميزة عن بقية المقررات

جدول رقم (ب) رمز المجالات المعرفية :

الرقم	مجال المعرفة	الرمز باللغة العربية	الرمز باللغة الانجليزية
1	**مطلوبات الجامعة:**		
	▪ الثقافة الإسلامية	سلم	ISL
	▪ اللغة العربية	عرب	ARB
	▪ اللغة الإنجليزية	نجل	ENG
	▪ الدراسات السودانية	درس	SST
2	العلوم الرياضية والاحصاء	ريض	MAT
4	هندسة البرمجيات	هبر	SE

5	نظم المعلومات	نظم	IS
6	تقانة المعلومات	تقن	ITC
7	العلوم الإنسانية والإدارية والاقتصادية	انس	HUM
8	علوم الحاسوب	حسب	CS
10	بحث تخرج	هبر 444	SE 444

مجالات المعرفة في بكالريوس الشرف في هندسة البرمجيات

يحتوي البرنامج على عدد من مجالات المعرفة حسب خطة الكلية الانموذج الموضوعة بواسطة وزارة التعليم العالي، إذ يحتوي هذا البرنامج على 165 ساعة معتمدة موزعة وفقاً لمجالات المعرفة التي يتضمنها الجدول رقم (1)

النسبة	المقترح	الحد الأقصى	الحد الأدنى	مجال المعرفة	الرقم
	الساعات المعتمدة				
40.0	66	66	66	علوم الحاسوب وهندسة البرمجيات (المطلوبات الأساسية)	1
5.5	9	15	6	(المطلوبات الإختيارية)	2
12.1	20	20	20	مطلوبات الجامعة	3
14.6	24	27	18	العلوم الرياضية و الاحصاء	4
9.1	15	20	12	تقانة المعلومات	5
9.1	15	18	6	علوم حاسوب	6
3.0	5	9	6	نظم المعلومات	7
6.6	11	12	6	العلوم الإنسانية والإدارية والاقتصادية	8
100%	165	185	143	المجموع	

مجالات المعرفة في هندسة البرمجيات (المطلوبات الأساسية)

الجدول رقم (2) يوضح مجال المعرفة للمطلوبات الأساسية لهندسة البرمجيات(اجباري) :

الساعات المعتمدة	اسم المقرر	الرمز
3 (2, 0, 3)	مبادئ هندسة البرمجيات	01
3 (2, 0, 3)	التفاعل بين الإنسان والحاسوب	02
3 (2, 0, 3)	أساليب البرمجة 1	03
3 (2, 0, 3)	أساليب البرمجة 2	04
3 (2, 0, 3)	البرمجة الموجهة	05
3 (2, 0, 3)	هياكل البيانات والخوارزميات	06
3 (2, 0, 3)	الذكاء الإصطناعي	07

الساعات المعتمدة	اسم المقرر	الرمز
3 (2, 0, 3)	تحليل وتصميم الكينونات الموجه	08
3 (2, 0, 3)	تطبيقات الإنترنت	09
3 (2, 0, 3)	نظم قواعد البيانات	10
3 (2, 0, 3)	مفاهيم لغات البرمجة	11
3 (2, 0, 3)	هندسة متطلبات البرمجيات	12
3 (2, 0, 3)	تصميم معمارية البرمجيات	13
3 (2, 0, 3)	إدارة قواعد البيانات	14
3 (2, 0, 3)	فحص البرمجيات	15
3 (2, 0, 3)	تطوير التطبيقات البرمجية النقالة	16
3 (2, 0, 3)	الطرق الرشيقة	17
3 (2, 0, 3)	معمارية الخدمة الموجهة	18
3 (2, 0, 3)	خدمات الوب	19
3 (2, 0, 3)	ضمان جودة البرمجيات	20
6 (0,0, 12)	مشروع التخرج	21
66		22

مجالات المعرفة هندسة البرمجيات (المطلوبات الإختيارية)

الجدول رقم (3) يوضح مجال المعرفة للمطلوبات الإختيارية هندسة البرمجيات:

الساعات المعتمدة	اسم المقرر	الرمز
3 (2, 0, 3)	التطوير المعتمد على المكونات	01
3 (2, 0, 3)	تحقيق وتدقيق تطوير البرمجيات	02
3 (2, 0, 3)	قياس وإدارة مشاريع البرمجيات	03
3 (2, 0, 3)	تكاليف البرمجيات	04
3 (2, 0, 3)	موضوع مستحدث في هندسة البرمجيات	05

مجالات المعرفة لمطلوبات الجامعة

الجدول رقم (4) يوضح مجال المعرفة لمطلوبات الجامعة

الساعات المعتمدة	اسم المقرر	الرمز
3 (3, 0, 0)	الثقافة الإسلامية 1	01
3 (3, 0, 0)	اللغة العربية 1	02
3 (3, 0, 0)	اللغة الإنجليزية 1	03
3 (3, 0, 0)	الثقافة الإسلامية 2	04
3 (3, 0, 0)	اللغة العربية 2	05
3 (2, 2, 0)	لغة إنجليزية متخصصة ESP	06
2 (2, 0, 0)	الدراسات السودانية	07
20	**المجموع**	

مجالات المعرفة للعلوم الرياضية والإحصاء

الجدول رقم (5) يوضح مجال المعرفة للعلوم الرياضية والإحصاء

الساعات المعتمدة	اسم المقرر	الرمز
3 (2, 2, 0)	حسبان 1	01
3 (2, 0, 3)	الإحصاء والإحتمالات	02
3 (2, 2, 0)	الرياضيات المتقطعة	03
3 (2, 2, 0)	الجبر الخطي والهندسة التحليلية	04
3 (2, 2, 0)	بحوث عمليات	05
3 (2, 2, 0)	حسبان2	06
3 (2, 2, 0)	المعادلات التفاضلية	07
3 (2, 2, 0)	التحليل العددي	08
24	**المجموع**	

مجالات المعرفة في تقانة المعلومات

الجدول رقم (6) يوضح مجال المعرفة في هندسة البرمجيات

الساعات المعتمدة	اسم المقرر	الرمز
3 (2, 0, 3)	تقنيات الانترنت	01
3 (2, 0, 3)	شبكات الحاسوب	02
3 (2, 0, 3)	نظم التشغيل	03
3 (2, 0, 3)	النظم المفتوحة	04
3 (2, 0, 3)	تكنولوجيا الوسائط المتعددة	05
15	**المجموع**	

مجالات المعرفة في نظم المعلومات

الجدول رقم (7) يوضح مجال المعرفة في نظم المعلومات

الساعات المعتمدة	اسم المقرر	الرمز
2 (2, 0, 0)	مبادئ نظم المعلومات	01
3 (2, 2, 0)	تحليل و تصميم النظم	02
5	**المجموع**	

مجالات المعرفة في علوم الحاسوب

الجدول رقم (8) يوضح مجال المعرفة في علوم الحاسوب

الساعات المعتمدة	اسم المقرر	الرمز
3 (2, 0, 3)	مبادئ علوم الحاسوب	01
3 (2, 0, 3)	أساسيات البرمجة	02
3 (2, 2, 0)	أمن المعلومات	03
3 (2, 0, 3)	تحليل وتصميم الخوارزميات	04

الساعات المعتمدة	اسم المقرر	الرمز
3 (2, 0, 3)	تنقيب البيانات	05
15	**المجموع**	

مجالات المعرفة في العلوم الإنسانية والإدارية والإقتصادية

الجدول رقم (9) يوضح مجال المعرفة في العلوم الإنسانية والإدارية والإقتصادية

الساعات المعتمدة	اسم المقرر	الرمز
2 (2, 0, 0)	مبادئ الإدارة	01
3 (2, 2, 0)	مهارات اتصال	02
3 (2, 2, 0)	مناهج البحث	03
3 (2, 2, 0)	اخلاقيات المهنة	04
11	**المجموع**	

تقسيم الخطة حسب الفصول الدراسية

تم تقسييم الخطة لعدد ثمانية فصول دراسية كما موضح أدناه:

السنة الدراسية الأولى

الفصل الدراسي الثاني				الفصل الدراسي الأول			
س . م	إسم المقرر	الرمز		س . م	إسم المقرر	الرمز	
3 (3, 0, 0)	الثقافة الإسلامية 2	سلم1204 ISL 1204		3 (3, 0, 0)	الثقافة الإسلامية 1	سلم1101 ISL 1101	
3 (3, 0, 0)	اللغة العربية 2	عرب 1205 ARB 1205		3 (3, 0, 0)	اللغة العربية 1	عرب 1102 ARB 1102	
3 (2, 2, 0)	لغة إنجليزية متخصصة ESP	نجل1206 ENG 1206		3 (3, 0, 0)	اللغة الإنجليزية 1	نجل 1103 ENG 1103	
3 (2, 2, 0)	الرياضيات المتقطعة	ريض 1203 MAT1203		2 (2, 0, 0)	دراسات سودانية	درس 1107 SST 1107	
2 (2, 0, 0)	مبادئ نظم المعلومات	نظم 1201 IS 1201		3 (2, 2, 0)	حسبان 1	ريض 1101 MAT 1101	
3 (2, 0, 3)	أساسيات البرمجة	حسب 1202 CS 1202		3 (2, 0, 3)	مبادئ علوم الحاسوب	حسب 1101 CS 1101	
3 (2, 2, 0)	حسبان 2	ريض1206 MAT 1206		3 (2, 0, 3)	الإحصاء والإحتمالات	ريض 1102 MAT 1102	
20	**مجمـوع الساعـات المعتمـدة**			**20**	**مجمـوع الساعـات المعتمـدة**		

السنة الدراسية الثانية

الفصل الدراسي الرابع				الفصل الدراسي الثالث			
س . م	إسم المقرر	الرمز		س . م	إسم المقرر	الرمز	
3 (2, 2, 0)	المعادلات التفاضلية	ريض 2107 MAT2107		3 (2, 0, 3)	الجبر الخطي والهندسة التحليلية	ريض2104 2104 MAT	
3 (2, 0, 3)	تحليل وتصميم الكينونات الموجه	هبر 2208 SE 2208		3 (2, 0, 3)	تحليل و تصميم النظم	نظم 2102 IS 2102	
3 (2, 0, 3)	أساليب البرمجة 2	هبر2204 2204SE		3 (2, 0, 3)	أساليب البرمجة 1	هبر 2103 SE 2103	
3 (2, 0, 3)	إدارة قواعد البيانات	هبر 2214 SE 2214		3 (2, 2, 0)	نظم قواعد البيانات	هبر 2110 SE 2110	
3 (2, 0, 3)	هياكل البيانات والخوارزميات	هبر 2206 SE 2206		3 (2, 0, 3)	تقنيات الإنترنت	تقن2101 2101 ITC	
3 (2, 0, 3)	شبكات الحاسوب	تقن 2202 ITC 2202		3 (2, 0, 3)	مبادئ هندسة البرمجيات	هبر 2101 SE 2101	
3 (2, 0, 3)	نظم التشغيل	تقن 2204 ITC 2204		3 (2, 0, 3)	التفاعل بين الإنسان و الحاسوب	هبر 2102 SE 2102	
21	**مجمـوع الساعـات المعتمـدة**			**21**	**مجمـوع الساعـات المعتمـدة**		

السنة الدراسية الثالثة

	الفصل الدراسي السادس			الفصل الدراسي الخامس	
س . م	إسم المقرر	الرمز	س . م	إسم المقرر	الرمز
3 (2, 2, 0)	مهارات الإتصال	انس 3202 HUM 3202	2 (2, 0, 0)	مبادئ الإدارة	انس3101 HUM 3101
3 (2, 0, 3)	خدمات الوب	هبر 3219 SE 3219	3 (2, 0, 3)	معمارية الخدمة الموجهة	هبر3118 SE 3118
3 (2, 0, 3)	هندسة متطلبات البرمجيات	هبر 3212 SE 3212	3 (2, 0, 3)	البرمجة الموجهة	هبر 3105 SE 3105
3 (2, 0, 3)	التحليل العددي	ريض3208 MAT 3208	3 (2, 0, 3)	بحوث العمليات	ريض 3105 MAT 3105
3 (2, 0, 3)	أمن المعلومات	حسب 3203 CS 3203	3 (2, 0, 3)	تصميم معمارية البرمجيات	هبر 3113 SE 3113
3 (2, 0, 3)	تكنولوجيا الوسائط المتعددة	تفن 3106 SE 3106	3 (2, 0, 3)	تطبيقات الإنترنت	هبر 3109 SE 3109
3 (2, 0, 3)	مفاهيم لغات البرمحة	هبر 4111 SE 4111	3 (2, 0, 3)	ضمان جودة البرمجيات	SEهبر 4120 4120
3 (2, 0, 3)	النظم المفتوحة	تقن3205 ITC 3205	3 (2, 0, 3)	الذكاء الإصطناعي	هبر 3107 SE 3107
24	مجمـوع الساعـات المعتمـدة		**23**	مجمـوع الساعـات المعتمـدة	

السنة الدراسية الرابعة

	الفصل الدراسي الثامن			الفصل الدراسي السابع	
س . م	إسم المقرر	الرمز	س . م	إسم المقرر	الرمز
3 (2, 2, 0)	اخلاقيات المهنة	انس4204 HUM 4204	3 (2, 2, 0)	مناهج البحث	انس4103 HUM 4103
3 (2, 0, 3)	تنقيب البيانات	حسب 3204 CS 3204	3 (2, 0, 3)	تحليل وتصميم الخوارزميات	حسب 3204 CS 3204
3 (2, 0, 3)	الطرق الرشيقة	هبر3117 SE 3117	3 (2, 0, 3)	تطوير التطبيقات البرمجية النقالة	هبر4216 SE 4216
3 (2, 0, 3)	مقرر إختياري 3	هبر 4223 SE 4223	3 (2, 0, 3)	مقرر إختياري 1	هبر 4121 SE 4121
6 (0,0,12)	مشروع التخرج	هبر 4444 SE 4444	3 (2, 0, 3)	مقرر إختياري 2	هبر 4122 SE 4122
18	مجمـوع الساعـات المعتمـدة		**15**	مجمـوع الساعـات المعتمـدة	

توصيف المقررات

أولاً مطلوبات الجامعة

عنوان المقرر : ثقافة إسلامية 1 3(2,2,0)

المتطلب السابق : -

وصف المقرر:

يتطرق المقرر لدراسة ومعرفة جملة الأصول ومجموعة الحقائق الإيمانية أو العقديَّة التي جاء بهاالشرع ودعا العباد إلى الإيمان بها إيماناً يقيناً لا شك فيه والجزم بصحتها والإيمان بها. كما يتطرق المقرر أيضاً الى معرفة أن العقيدة الإسلامية التي تمثِّل الأساس الذي تُبنى عليه العبادات والأخلاق.كما يقوم الطلاب بكتابة بحوث تتضمن ما كان مقرراً عليهم في أصول العقيدة والإيمان

اهداف المقرر:

- معرفة أن العقيدة الإسلامية تمثِّل الأساس الذي تُبنى عليه العبادات والأخلاق وتقدم به النظم .
- معرفة أن أعمال الإنسان مهما كانت لاقيمة لها إذا لم تقم على قاعدة الإيمان .
- إدراك أن الإيمان بالله تعالى هو أصل العقيدة وأساسها وعليه تبنى كل أصول الإيمان .
- بيان لماذا قُدم ذكر الملائكة في الكتاب والسنة على ذكر الكتاب و النبيين.
- ذكر الكتب التي ورد ذكرها من الكتاب والسنة.
- إدراك أنَّ الله سبحانه وتعالى أرسل الرسل وبعث فيهم الأنبياء ليهدوا الناس إلى الحق وما يحقق لهم السعادة في الدنيا والآخرة، لئلا يكون للناس على الله حجة بعد الرسل.

مفردات المقرر:

- التعريف بالمفاهيم والمصطلحات
  - الثقافة، العلم، الحضارة، المدنية، العقيدة الإسلامية
- دراسة الأصول الأساسية للعقيدة .
- دراسة أركان الإيمان الأساسية
  - الايمان بالله
  - الايمان بالرسل
  - الايمان بالكتب السماوية

طريقة التقييم :

- كتابة البحوث والإختبارات 30%
- الإمتحان النهائي 70%

المراجع :

1. عزمي طه ، قرعوش السيد ، "الثقافة الإسلامية"، 2014 .
2. احمد المومني، الثقافة الإسلامية: دراسات ومفاهيم حديثة، 2010

عنوان المقرر :ثقافة إسلامية 2 (0,2,2)3

المتطلب السابق : ثقافة إسلامية 1

وصف المقرر:

يقوم المقرر بدراسة علوم القرآن: نزوله و جمعه، و تفسيره و التعريف بالحديث و علومه، باعتبارهما المصدران الرئيسان اللذان يرجع إليهما المسلم في كل شأن يتعلق بالعقيدة و الشريعة و الأخلاق و السلوك . كما يقوم الطلاب بكتابة بحوث تتضمن ما كان مقرراً عليهم في علوم القرآن والسنة

اهداف المقرر:

- التعريف بعلوم القرآن المختلفة من تفسير و أسباب نزول و إعراب و بلاغة.
- التبصير بالسنة الشريفة و علومها و جمعها و الإحتجاجبها.
- التعريف بكيف كان نزول القرآن.
- بيان كيف سلك المفسرون في تفسير القرآن حتى اكتملت علومه.
- بيان بكيف دونت السنة الشريفة.
- توضيح كيف أصبحت السنة علوما محددة – يعرف منها الحديث الصحيح، من الضعيف.

مفردات المقرر:

المواضيع النظرية:
- مقدمة في علوم القرآن.
- أصول التفسير: تفسير سورتي الأعراف و التوبة.
- الحديث و علومه
  ○ الحديث الضعيف
  ○ الحديث الصحيح

طريقة التقييم :

- كتابة البحوث والإختبارات 30%
- الإمتحان النهائي 70%

المراجع :

1. عزمي طه ، قرعوش السيد ، "الثقافة الإسلامية"، 2014 .
2. احمد المومني، الثقافة الإسلامية: دراسات ومفاهيم حديثة، 2010

عنوان المقرر : لغة عربية 1 3(2,2,0)

المتطلب السابق : -

وصف المقرر:

يتضمن المقرر موضوعات تتعلق بإتقان المهارات الأساسية في اللغة العربية محادثة و كتابة و تدريب الطالب علي إتقان النطق الصحيح. كما يتطرق إلى معالجة المشكلات التي يعاني منها الطلاب في الكتابة الإنشائية والأخطاء الإملائية ومعرفة صفات الأصوات و مخارجها

اهداف المقرر:

- التدريب علي الرسم الإملائي للهمزة والألف اللينة والتاء المربوطة.
- الوقوف علي عناصر الاتصال اللغوي والتدريب عليها.
- إلمام الطالب بأسس الكتابة الإنشائية ،إختيار الكلمة و بناء الجملة والفقرة.
- التدريب علي استخدام الروابط والصيغ الأسلوبية.

مفردات المقرر:

- اللغة: تعريفها و أهميتها و أنواعها .
- بناء الجملة وتحليلها، الكتابة الإنشائية.
- المفردات النحويةـ أنواعها واستعمالهما ومعانيها (الجارة والعاطفة)
- الصيغ والروابط الأسلوبية.
- الأسلوب صفاته وخصائصه.
- المعاجم وطرق استعمالها

طريقة التقييم :

- كتابة البحوث والإختبارات 30%
- الإمتحان النهائي 70%

المراجع :

1. د.عباس محجوب مجمود، د. عبد النبي محمد علي ، "المهارات اللغوية"، الخرطوم: جامعة السودان المفتوحة،2006
2. أحمد الشايب، " الأسلوب: دراسة بلاغية تحليلية لاصول الاساليب الادبية"، مكتبه النهضة المصرية1956 .

عنوان المقرر : لغة عربية 2 (2,2,0)3
المتطلب السابق : لغة عربية 1

وصف المقرر:

يركز المقرر على دراسة التقارير و الرسائل الإدارية وغيرها وكذلك علم المصطلحات والتعريب و التلخيص أهدافه ومراحله

اهداف المقرر:

- إتقان المهارات الأساسية في الكتابة الإجرائية.
- تنمية مهارة عرض المعلومات و حسن التعبير.

مفردات المقرر:

- أدب التخاطب الشفوي(المحاضرة والندوة والخطابة).
- الأدب ودوره في الحياة العسكرية، وعلاقته بالهندسة.
- اللغة العلمية خصائصها وصفاتها.
- نماذج لشعر الجهاد في السودان المعاصر.
- الأخطاء اللغوية أنواعها وأسبابها وطرق علاجها.

طريقة التقييم :

- كتابة البحوث والإختبارات 30%
- الإمتحان النهائي 70%

المراجع :

1. د.عباس محجوب مجمود، د. عبد النبي محمد علي ، "المهارات اللغوية"، الخرطوم: جامعة السودان المفتوحة،2006
2. الدكتور عبدالله خضر حمد، " اتجاهات النقد العربي القديم، 2017
3. محمد القاسمي، قضايا النقد الأدبي المعاصر، دار يافا العلمية للنشر والتوزيع، 2010.

Course Title: English I 3(2,2,0)
Prerequisite: -

Course Description:

This course focus on the standards of English reading, writing, and conversational skills

Course Objectives:

- To know the Importance of learning English language
- Improve the standard of English comprehension, and communicative skill
- To make use of Technical English needed for the computing courses.

Course Contents:

- The Importance of learning English language
- Reading Effectively
- Using The Dictionary
- Writing Skills, Note Taking, Preparing and Taking Exams

Course Assessment

- Tests, homework and reports. (30%)
- Final • Examinations (70%).

References

1. English Language Course. (1) Study Skills, Mashreq University
1. Murat KAPLAN, English Grammar For University Students: Foreign Language Study, 2017

Course Title: English for Special Purposes 3(2,2,0)
Prerequisite: English I

Course Description:

This course focuses on the vocabulary and style of "Sci-tech" English for academic and professional purposes. Depending on the interest of the students, topics may relate to computer science, engineering, and others. Course materials include selections from textbooks, news articles, televised science programs and radio news features. Significant attention will also be paid to improve overall English skills.

Course Objectives:

- Introducing and learning the technical terms for information technology
- To explain and translate standard acronyms in information technology reports
- To gain the ability to write an academic scientific report

Course Contents:

- Academic writing, e.g. voice, interaction with sources, academic conventions, avoiding plagiarism, presenting an argument
- Effective approaches to research and writing processes for different purposes
- Effective use of information and communication technology (ICT) tools for information handling and the presentation of assignment tasks

Course Assessment

- Tests, homework and reports. (30%)
- Final •   Examinations (70%).

References

1.   English Language Course. (2) Study Skills, Mashreq University
2.   Murat KAPLAN, English Grammar For University Students: Foreign Language Study, 2017

عنوان المقرر دراسات سودانية   (2,0,0)2

المتطلب السابق: -

وصف المقرر:

يركز المقرر على اجلاء الحقائق الجغرافية ، الأساسية عن السودان التي تدفعه للنهوض بدوره وكذلك التعريف بالمعالم الأساسية في تاريخ السودان

اهداف المقرر:

- التعريف بخصائص المجتمع السوداني و مكوناته
- التبصير بالأخلاق والقيم الفاضلة الموروثة
- تقوية الإحساس الوطني ودعم التماسك الاجتماعي في السودان

مفردات المقرر:

- تكوين وتطور الدولة السودانية.
- الحضارات القديمة.
- دراسه الملاحم و البطولات الوطنية .
- الشخصية السودانية ومكوناتها والأخلاق والقيم والعادات والتقاليد السودانية.
- مكونات الثقافة السودانية ومظاهر الثقافة السودانية ودورها في تعزيز الهوية الوطنية.
- علاقة السودان الخارجية -الدور الاقليمى-الدور العالمي.
- زيارات علميه لمواقع الآثار والحضارات في السودان.

طريقة التقييم :

- كتابة البحوث والإختبارات 30%
- الإمتحان النهائي 70%

المراجع :

1.   د. فدوي عبد الرحمن علي طه، "السودان في عهد الحكم الثنائي"، 1899-1956.
2.   حسن نجيله, ملامح من المجتمع السوداني، دار عزة، 2005

Course Title: Calculus I 3(2,2,0)
Pre- requisite: -

Course Description:

This course in calculus is intended to develop practical skills in differential and integral calculus. As well, it is intended to illustrate various applications of calculus to technical problems. The rules of differentiation will be introduced, and methods of differentiating various algebraic and transcendental functions will be developed.

Course Objectives:

1. Differentiate any algebraic or transcendental function.
2. Apply differentiation to determine roots of equations by Newton's method to determine maxima and minima of functions and determine power series.
3. Integrate any algebraic or transcendental function either by algebraic methods, by the use of tables, or by numerical methods.
4. Apply integration to determine volumes, areas, and averages
5. Solve differential equations by integration, by standard form procedures, by numerical methods or by Laplace transforms.

Course Contents:

- Definition of derivative as slope or the rate of change
- Rules of differentiation
- Derivatives of trigonometric, inverse trigonometric, logarithmic, exponential functions
- Implicit differentiation
- Definition of integral as area or inverse derivative
- Methods of algebraic integration
- Tables of integrals
- Geometrical and physical applications of derivatives.

Course Assessment

- • Coursework   30%
- • Examination70%

References

1. Varberg, Dale E., Edwin Joseph Purcell, and Steven E. Rigdon. *Calculus with differential equations*. Pearson/Prentice Hall, 2007.
2. Fitzpatrick, Patrick. *Advanced calculus*. Vol. 5. American Mathematical Soc., 2009.

Course Title: Calculus II 3(2,2,0)

Pre- requisite: Calculus I

Course Description:

This course is an introduction to integral calculus. It develops the concept of the integral and its applications. Other topics include techniques of integration, improper integrals, sequences and series of numbers, Taylor series, polar coordinates, parametric equations, and separable differential equations.

Course Objectives:

- Recognize and apply the Fundamental Theorem of Calculus
- Integrate any algebraic or transcendental function either by algebraic methods, by the use of tables.
- Apply integration to determine volumes, areas, and averages
- Evaluate integrals involving exponential functions to any base
- Evaluate integrals involving basic trigonometric functions and integrals
- Choose an appropriate method and apply the techniques to find anti derivatives and evaluate definite integrals

Course Contents:

- Introduction to the Integral
- Techniques of Integration
- Applications of Integration
- Definition of integral as area or inverse derivative
- Several variables
- Differentiation of several variables

Course Assessment

- • COURSEWORK   30%
- • EXAMINATION   70%

References

1. Varberg, Dale E., Edwin Joseph Purcell, and Steven E. Rigdon. *Calculus with differential equations*. Pearson/Prentice Hall, 2007.
2. Fitzpatrick, Patrick. Advanced calculus. Vol. 5. American Mathematical Soc., 2009.

Course Title: Probability & Statistics 4(2,2,2)

Pre- requisite: -

Course Description

Statistical literacy is an essential skill that enables people to understand and make sensible decisions based on the analysis of numerical information. Data and numerical arguments exist not only in all areas of academic inquiry but also in everyday life.

Course Objectives

- Describe the fundamental principles including the laws and theorems arising
- Identify and apply the laws and formulas that result directly from the definitions;
- Find regression equations for data collected; use regression equations to make predictions.
- Set up probability models for a range of random phenomena, both discrete and continuous and apply the notions of conditional probability.
- Use a statistical package, both for numerical work and to help analyses data

Course contents

- Date representation
- Measures of central tendency
- Measure of dispersion
- Simple probability theory
- Probability distributions
- Sampling
- Statistical supposal tests
- Analysis of variance
- Coefficient of variation
- Regression and correlation

Course Assessment

- • Coursework   30%
- • Examination70%

References

1.Ian F. Blake, An Introduction to Applied Probability, Krieger , 1987
2.Murray Spiegel, John Schiller, R. Srinivasan, Schaum's Outline of Probability and Statistics, Schaum, 2000

Course Title: Discrete Mathematic 3(2,2,0)
Prerequisite: -

Course Description:

This course studies the mathematical elements of computer science including propositional logic, predicate logic, sets, functions and relations, combinatorics, mathematical induction, recursion, algorithms, matrices, graphs, trees, and Boolean logic.

Course Objectives

- Use formal logic proofs and/or informal but rigorous logical reasoning to, for example, predict the behavior of software or to solve problems such as puzzles.
- Illustrate by example the basic terminology of graph theory, and some of the properties and special cases of each.
- Demonstrate different traversal methods for trees and graphs.
- Model problems in computer science using graphs and trees.

Course contents

- Basic Logic
- Sets
- Basics Of Counting
- Functions
- Relations
- Graphs And Trees

Course Assessment

- Coursework   30%
- Examination   70%

Reference:

Kenneth H. Rosen, Discrete Mathematics and Its Applications, McGraw-Hill Higher Education, 2012

David Makinson, Sets, Logic and Maths for Computing, Springer, 2012

Course Name:Linear Algebra 3(2,2,0)
Pre- requisite:-

Course Description:
A first course in linear algebra and analytical geometry involving vectors also serves as an introduction to the development of logical structure, deductive reasoning and mathematics as a language. For students the tools of linear algebra and analytical geometry will be as fundamental in their professional work as the tools of calculus.

Course Objectives

- To develop abstract and critical reasoning by studying logical proofs and the axiomatic method as applied to linear algebra.
- Define a vector and perform basic vector operations (addition, scalar multiplication,   length of a vector).
- Solve equations involving complex numbers.
- Give a geometrical proof of triangle inequality.
- Give geometrical applications of the dot product of 3-dimensional vectors.
- Perform basic matrix operations.
- Use Gaussian Elimination to solve systems of linear equations.
- Solve a system of equations by making use of determinant.

Course contents

- Algebraic definition of a vector .Geometric interpretation of a vector. The norm of a vector. Unit vectors.
- Geometric proof of the Triangle Inequality.
- Roots of polynomials and de Moivre's theorem.
- Introduction of a matrix as an array of numbers. Gaussian Elimination and augmented matrices.
- Recursive definition of the determinant. Evaluation of determinants. Properties of the determinant.
- Effect of elementary row (and column) operations on the determinant of a matrix. Determinant of a triangular matrix.
- The adjoint matrix. The inverse of a matrix in terms of its determinant and its adjoint matrix.
- The solution of a system of linear equations using the determinant. Cramer's Rule.

Course Assessment
- Coursework   30%
- Examination   70%

References
1. J. Straus, Linear Algebra with Applications, Prentice Hall, 2006
2. Martin Anthony, Michele Harvey, Linear Algebra, Concepts and Methods, Cambridge University Press, 2012

Course Name: Operation Research 3(2,2,0)
Pre- requisite: Linear Algebra

Course Description:
Operations research helps in solving peoblems in diffenert environments that needs dicisions. The module conver topics that include: linear programming, Transportation, Assignment, and CPM/ MSPT techniques. Analytic techniques and computer packages will be used to solve problems facing business managers in decision environments.

Course Objectives

- introduce students to use quantitive methods and techniques for effective decisions–making; model formulation and applications that are used in solving business decision problems.
- Identify and develop operational research models from the verbal description of the real system.
- Understand the mathematical tools that are needed to solve optimisation problems.
- Use mathematical software to solve the proposed models.

Course contents

1. Introduction to Operations Research (OR)
2. Introduction to Foundation mathematics and statistics
3. Linear Programming (LP), LP and allocation of resources, LP definition, Linearity requirement
4. Maximization Then Minimization problems.
5. Graphical LP Minimization solution, Introduction, Simplex method definition, formulating the Simplex model.
6. Linear Programming – Simplex Method for Maximizing

Course Assessment
- Coursework   30%
- Examination   70%

References
1. Wayne L, Operations Research: Applications and Algorithms, Winston Publisher, 2004
2. Bernard W. Taylor III, Introduction to Management Science 9th Edition, Pearson, 2007

Course Name: Differential Equations 3(2,2,0)

Pre- requisite:Calculus 1&2

Course Description:

The course will demonstrate the usefulness of ordinary differential equations for modeling physical and other phenomena. Complementary mathematical approaches for their solution will be presented, including analytical methods, graphical analysis and numerical techniques.

Course Objectives

1. Understand and apply mathematical concepts and reasoning,
2. Analyze and interpret various types of data.
3. Formulate differential equation
4. Solve different types of differential equation by various methods
5. Develop methods to solve differential equations

Course contents

- first order equations
- mathematical models
- linear equations of second order
- the Laplace transform
- linear systems of arbitrary order and matrices
- nonlinear systems and phase plane analysis
- numerical methods

Course Assessment

- Coursework   30%
- Examination   70%

References

1. J. Polking, A. Boggess, and D. Arnold: *Differential Equations* (2nd edition). Prentice Hall, 2006
2. James Brannan, William Boyce Differential Equations with Boundary Value Problems, 2nd edition, Willey, 2010

Course Name: Numerical Methods 3(2,2,0)

Pre- requisite:Calculus 1&2- Differential Equations

Course Description:

This course is an introduction to the numerical analysis. The primary objective of the course is to develop the basic understanding of numerical algorithms and skills to implement algorithms to solve mathematical problems on the computer.

Course Objectives

- Develop an understanding of the core ideas and concepts of Numerical Methods.
- Recognize the power of abstraction and generalization, and to carry out investigative mathematical work with independent judgment.
- Apply rigorous, analytic, highly numerate approach to analyze and solve problems using Numerical Methods
- Apply standard numerical techniques
- Using computer programming to solve problems

Course contents

- Series expansions: from calculus to computation
- Integrals as sums and derivatives as differences
    - Solution of systems of equations(Gauss Elimination method)
    - Solution of differential equation(Euler, Frung Kutta)
- Interpolation, spines, and a second look at numerical calculus
- Numerical methods for ODE, initial-value problems
- Root finding, Newton's method, boundary-value problems
- Fourier transform, Fourier series, Shannon sampling theory
- Interpolation
- Simpson's method
- Least-squares approximation

Course Assessment

- Coursework   30%
- Examination   70%

References

1. Richard L. Burden, J. Douglas Faires, Numerical Analysis, Thomson, 2005
2. F. B. Hildebrand , Introduction to Numerical Analysis: Second Edition, Dover Publications, 1987

Course Title: Introduction to Software Engineering 3(2,0,3)

Prerequisite: Introduction to Computer Science

Course Description

Software engineering is the branch of computer science that creates practical, cost-effective solutions to computing and information processing problems, preferentially by applying scientific knowledge, developing software systems in the service of mankind.

Course Objectives:

- Gain the knowledge of Software process models and software project management
- Introduce the Software development phases: requirements and analysis, design and construction, testing, deployment, operations, and maintenance
- Be familiar with Modern software development and management platforms, tools, and services
- Discuss software development in an analytic manner.

Course Contents:

- Introduction to System and Software Engineering
- Introduction; Software Lifecycle
- Introduction to Software Development Processes
- Introduction to Software Requirements
- Introduction to Requirements Engineering Process
- Software Processes.
- Project Management.

Course Assessments:

- Coursework   30%
- Examination   70%

References:

1. Ian Sommerville 2016, Software Engineering, 10th ed, Prentice
2. Roger Pressman 2014, Software Engineering-A Practitioner's Approach, 8th edition, McGraw-Hill.

Course Title: Human Computer Interaction 3(2,0,3)

Pre- requisite: Programming Fundamentals

Course Description:

HCI is an interdisciplinary field that integrates theories and methodologies from computer science, psychology, design, and many other areas. Course readings will span current theory and practice in interface specification, design and evaluation.

Course Objectives

- Describe and apply core theories, models and methodologies from the field of HCI.
- Design Web pages using HTML to demonstrate the different graphical user interfaces guidelines.
- Compare user-centered development to traditional software engineering methods.
- Discuss evaluation criteria: task time/completion, time to learn, retention, errors, and user satisfaction.
- Design, implement and evaluate effective and usable graphical computer interfaces.

Course contents:

- Foundations of Human–Computer Interaction
  - Human Capabilities, The Computer, The Interaction, Paradigms
- The Design Process
  - Interaction Design Basics
  - HCI in the Software Process
  - Design Rules
  - Universal Design
- Implementation Support
- Evaluation and User Support
- Users Models
- Task Models and Dialogs

Course Assessment:

- Coursework   30%
- Examination   70%

References:

1. Sharp, Rogers and Preece, Interaction Design: Beyond Human Computer Interaction, 2015.
2. Cooper, Reimann, Cronin, & Noessel, The Essentials of Interaction Design, Fourth Edition by (2014).

Course title: Programming Methods I

Pre-requisite: Programming Fundamentals

Course Description:

In this continuation of programming concepts, students are introduced to the programming tools required to solve a more advanced set of problems. Students further develop their knowledge of the principles of object-oriented design and programming, including the use of interfaces and inheritance, and learn the fundamentals of sorting data and data structures.

Course Objectives:

- Work with procedural and object-oriented aspects.
- Develop sound techniques on designing, developing, and documenting well-structured programs using proper software engineering principles.
- Continue to apply problem solving skills and provide a foundation for advanced programming courses using an OOP (object-oriented programming) methodology.
- Implement basic common programming data structures (for use in further programming courses).
- Develop a GUI interface and related processing for an application.

Course Contents:

- Introduction
- Data and Expressions
- Using Classes and Objects
- Conditionals and Loops
- Writing Classes
- Arrays
- Recursion

Course Assessment

- Coursework   30%
- Examination   70%

References

1. Chase, J, Lewis, J, and DePasquale, P. *Java Foundations: Introduction to Program Design & Data Structures* . 4th edition. Pearson, (2017).
2. Liang, Daniel, "Introduction to Java Programming (Brief Version), Se", Addison Wesley, (2009)

Course title: Programming Methods II

Pre-requisite: Programming Methods I

Course Description:

This course of study builds on the skills gained by students in Java Fundamentals or Java Foundations to help advance Java programming skills. Students will design object-oriented applications with Java and will create Java programs using hands-on, engaging activities.

Course Objectives:

- Write, compile and execute Java programs
- Build robust applications using Java's object-oriented features
- Create robust applications using Java class libraries
- Develop platform-independent GUIs
- Read and write data using Java streams
- Develop a GUI interface and related processing for an application.

Course Contents:

- Object-oriented software construction
- JDBC
- Java Memory and the JVM
- Exceptions
- Recursion
- Event driven programming

Course Assessment

- Coursework 30%
- Examination 70%

References

3. Chase, J, Lewis, J, and DePasquale, P. *Java Foundations: Introduction to Program Design & Data Structures* . 4th edition. Pearson, (2017).
4. Liang, Daniel, "Introduction to Java Programming (Brief Version), Se", Addison Wesley, (2009)

Course Title: Object Oriented Programming3(2,0,3)

Prerequisite: Programming Method 2

Course Description:

This course is to equip students with advanced design and programming techniques in the object-oriented programming paradigms, including objects, classes, methods, parameter passing, information hiding, inheritance and polymorphism are introduced and their implementations using Java.

Course Objectives:

1. To acquire skills needed for developing high quality object-oriented programs
2. To be able to use of object-oriented design notations and support tools such as UML for modeling problem solutions and software systems,
3. To be proficient in object-oriented programming environments.

Course Contents:

1. Classes and Objects in Java
2. Object Design and Programming with Java
   a. Abstraction
   b. Inheritance
3. Polymorphism
4. Java Exception Handling
5. Java Collections API
6. GUI framework Design by abstraction

Course Assessment

- Coursework   30%
- Examination   70%

References

1. Horstman, Cay. Big Java Early Objects 6th Edition. New York: John Wiley & Sons.
2. Xiaoping Jia's Object-Oriented Software Development Using Java, 2 nd edition, Addison Wesley, 2002.

Course title: Data structures and Algorithms 3(2.0.3)

Pre requisite: Programming Fundamentals

Course Description:

This course covers analysis and design of fundamental data structures and engages learners to use data structures as tools to algorithmically design efficient computer programs that will cope with the complexity of actual applications. The course focuses on basic and essential topics in data structures, including array-based lists, linked lists, queues, priority queues, trees, heaps..

Course Objectives:

- Write programs that use each of the following data structures: arrays, records, strings, linked lists, stacks, queues, and hash tables Illustrate by example the basic terminology of graph theory and trees
- Identify the properties and structural patterns in data structures.
- Apply abstract data types to the design of data structures.
- Write code in pseudocode and high-level programming languages for the implementation of various data structures and algorithms.

Course content

- Review of elementary programming concepts
- Fundamental data structures:
    - Stacks; queues; linked lists; hash tables; trees; graphs
- Fundamental computing algorithms:
    - simple searching and sorting algorithms (linear and binary search, selection and insertion sort);
    - hash tables, including collision-avoidance strategies;
    - binary search trees;
    - representations of graphs; depth - and breadth-first traversals

Course Assessment

- Coursework   30%
- Examination   70%

References

1. Weiss, Mark A. *Data structures & algorithm analysis in C++*. Pearson Education, 2012.
2. Shaffer, Clifford A. *A practical introduction to data structures and algorithm analysis*. Upper Saddle River, NJ: Prentice Hall, 1997.

Course Title: Artificial intelligence 3(2,0,3)

Prerequisite: -

Course Description:

Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviors on a computer. The ultimate goal of AI is to make a computer that can learn, plan, and solve problems autonomously.

Course Objectives:

- Explain what constitutes "Artificial" Intelligence
- Identify systems with Artificial Intelligence.
- Explain how Artificial Intelligence enables capabilities that are beyond conventional technology
- Use classical Artificial Intelligence techniques, such as search algorithms,
- Apply Artificial Intelligence techniques for problem solving.

Course Contents:

- Introduction to AI
- Problem formulation
- Knowledge representation
  - Propositional logic, First order predicate logic
  - Semantic networks, Frames
  - Production rules
- Search techniques
- Production system
- Machine learning
- Information retrieval and extraction

Course Assessment

- Coursework   30%
- Examination   70%

References

1. S. Russell and P. Norvig. Artificial Intelligence: A Modern Approach. 3rd edition. Prentice Hall, 2009.
2. Philip C, Jackson Jr, Introduction to Artificial Intelligence, Dover Publication, NY, 1974

Course Title: Object-Oriented Analysis and Design 3(2,0,3)

Prerequisite: System Analysis and Design

Course Description:

Object oriented analysis and design is a course that presents an introduction to the design and construction of software systems using techniques that view a system as a set of objects that work together to realize the system's functionality.

Course Objectives:

- Create, Critique and Refine customer Use Cases.
- Transform Use Cases into Object Oriented software Realizations through OO Analysis and OO Design.
- Document requirements, analysis, and design models in the Unified Modeling Language (UML) notation.
- Apply techniques of state machines and design patterns to designs.

Course Contents:

- Introduction to OOAD
- Requirements Elicitation
- Capturing Functional Requirements with Use Cases
- Writing Use Case Scenarios
- Use Case Diagrams and Documentation
- Finding Candidate Classes
- Static Analysis and Design Modeling
- Dynamic Analysis and Design Modeling
- State Modeling
- Design Patterns
- Object Constraint Language
- Persistence

Course Assessment

- Coursework   30%
- Examination   70%

References

1. Design Patterns Explained: A New Perspective on Object Oriented Design (Second Edition) Alan Shalloway and James R. Trott
2. Design Patterns: Elements of Reusable Object-Oriented Software Erich Gamma, Richard Helm, Ralph Johnson and John Vissides ISBN 0-201-63361-2

Course title: Internet Technologies   3(2,0,3)

Pre requisite: -

Course Description:

Internet Techologies is a comprehensive study of the Internet and the World Wide Web.   This course will equip the students with the necessary knowledge to design and implement internet applications. It emphasizes on the specific technologies of these applications and how to employ them in building effective and efficient applications.

Course Objective:

- Develop an understanding of the technological foundations of the Internet and core Internet protocols (TCP/IP, SMTP, FTP, Telnet, ICMP, RSS, and HTTP);
- Understand client/server relationships in the context of the Internet and intranets;
- Identify important Internet content and graphics formats and understand the access issues they present users and the software they require;
- Develop a framework for evaluating web resources and designs;
- Develop advanced web publishing and design skills using the Hypertext Markup Language (HTML);

Course content

- The basic principles of WWW sites planning and creation
- The basics of sites creation using language HTML
- Cascading Style Sheets (CSS) for supplying stylistic information to web pages.
- Client-side programming
- Server-side programming
- Dynamic Web pages creation
- Languages for description and data representation
- Database access through the web
- Separating Programming and Presentation

Assessment

- Coursework   30%
- Examination   70%

References

1. Ian S. Graham The HTML Sourcebook Fifth edition A complete Guide to HTML, Wiley Computer Publishing, John Wiley & Sons, Inc.

2. Deitel P.J. and Deitel H.M. 2013, Internet & World Wide Web How to Program , Pearson Prentice Hall

Course Title: Database Systems   3(2,0,3)
Pre requisite:

Course Description:

   The course introduces the concepts and techniques of database systems .Topics covers database modeling concept and database physical design

Course Objectives:

- Explain the characteristics, goals, functions, models, components, applications, and social impact of database systems.
- Describe the main concepts of relational data model.
- Demonstrate queries in the relational algebra and relational calculus.
- Explain and demonstrate the concepts of entity integrity constraint and referential integrity constraint
- Prepare a relational schema from a conceptual model developed using the entity relationship model
- Explain the concepts of Physical database design

Course Contents:

1. Database systems:
2. components of database systems;
   1. DBMS functions; database architecture and data independence
3. Data modeling:
   1. Data modeling; conceptual models; relational data model
4. Relational databases:
   1. Mapping conceptual schema to a relational schema; entity and referential integrity; relational algebra and relational calculus

Course Assessment

- •   Coursework   30%
- •   Examination   70%

References

1. Ramez A. Elmasri and ShamkantNavathe 2016, Fundamentals of Database Systems, 7th ed, Addison Wesley
2. Thomas Connolly and Carolyn Begg, Addison Wesley 2015, Database Systems a Practical Approach to Design, Implementation, and Management. 6th ed,

Course Title: Programming Languages Concepts 3(2,0,3)
Pre requisite:

Course Description:

The purpose of this course is to study fundamentals concepts in programming languages and major tools and techniques to implement them.

Course Objectives:

- Learn new programming paradigms and languages
- Describe programming language syntax formally and semantics informally.
- Identify appropriate programming languages to use to address the specific needs of a stated problem.
- Explain and apply basic constructs and concepts used in common programming languages.

Course Contents:

- Formal aspects of syntax and semantics
- Naming, scoping, and binding
- Scanning, parsing, semantic analysis, and code generation
- Control flow, subroutines, exception handling, and concurrency
- Type systems, data structures, data abstraction, and storage management
- Imperative, functional, logic-based, and object-oriented programming paradigms
- Programming environments and tools

Course Assessment

- Coursework   30%
- Examination   70%

References

1. P. Sestoft, Programming Language Concepts , Second edition. Springer, 2017
2. David Padua, Programming Language Pragmatics, Fourth Edition, Morgan Kaufmann Publishers, 2017

Course Title: Software Requirements Engineering3(2,0,3)

Prerequisite: Introduction to Software Engineering

Course Description:

Requirements Engineering (RE) provides the basis for successful software development, and is increasingly recognized by practitioners as one of the most important stages in the software development life cycle.

Course Objectives:

- Identify and analyse stakeholders and their needs,
- Apply the core principles of RE
- Elicit and specify requirements using industry standards,
- Apply corresponding reference structures (frameworks),
- Create models of requirements using a variety of notations and techniques, including domain and usage models,

Course Contents:

1. An introduction to concepts, methods, and tools for the creation of large-scale software systems.
2. Methods, tools, notations, and validation techniques to analyze, specify, prototype, and maintain software requirements.
3. Introduction to object-oriented requirements modeling, including use case modeling, static modeling, and dynamic modeling using the Unified Modeling Language (UML) notation.
4. Concepts and methods for the design of large-scale software systems.
5. Fundamental design concepts and design modeling using UML notation.

Course Assessment

- Coursework   30%
- Examination   70%

References

1. Requirements Engineering for Software and Systems, Second Edition, Phillip A. Laplante
2. Software Requirements Engineering, Sidney C. Bailin

Course Title: Software Design and Architecture 3(2,0,3)
Prerequisite: Introduction to Software Engineering

Course Description:

The software architecture of a program or computing system is the structure or structures of the system, which comprise software components, the externally visible properties of those components, and the relationships between them.

Course Objectives:

- describe the essential elements of software architecture
- discuss the issues related to architecting a large-scale software system
- describe and understand different software architectures views and styles
- documenting a software architectures
- describe, understand, and be able to use the AADL (Architecture Analysis & Design Language)
- working as part of a team, develop, analyze and critique an architecture of a software system

Course Contents:

- Introduction to software architectural views and styles
- Architectural Styles
  - C&C Style
  - Allocation Style
  - Module Style
- Documenting Interfaces
- Documenting Beavior
- Documenting architectural through views
- Reviewing architecture documents
- Architecture Analysis Languages (ADLs)

Course Assessment

- Coursework   30%
- Examination   70%

References

1. Clements, P., et al., Documenting Software Architectures: Views and Beyond, 2nd Edition, Addison- Wesley, 2010.
2. Len Bass, et al., Software Architecture in Practice, Addison-Wesley, 2003.

Course Title: Database Systems Administration 3(2,0,3)
Pre requisite: Database Systems

Course Description:

The aim of this course is to introduce students to the basic database management administration concepts and practice on the Oracle environment

Course Objectives

1. Installing Oracle Software
2. Creating an Oracle Database Using DBCA
3. Managing Database instances and ASM instances
4. Managing and controlling database network environment
5. Define and devise transaction management, concurrency control, crash recovery components

Course Contents:

1. Oracle Database Architecture
2. Database installation and creation. (use DBCA)
3. Managing Database instances and ASM instances
4. Oracle Network environment
5. Database storage structures
6. User security
7. Concurrency control
8. Database auditing
9. Database maintenance

Course Assessment:

- Coursework   30%
- Examination   70%

References:

6. Data Base Systems, Design, Implementation and Management , Rob, Coronel, Thomson Course Technology
7. Student Guides for Oracle Database Administration. Year/Edition: 2010 Aug

Course Title: Software Quality Assurance 2(2,0,3)

Prerequisite: Software Design and Architecture

Course Description:

The course looks at software quality control and assurance processes and practices, as well as support disciplines such as software project management, software configuration management and release management.

Course Objectives:

- Give Reasons for SQA failures and factors critical to success of SQA in IS development.
- Learn truly agile test planning techniques that prevent showstoppers.
- Designing tests that spot numerous ordinarily-overlooked defects in less time.
- Applying risk analysis, reusable test ware, and metrics to perform more thorough testing in less time.
- Measuring system quality and SQA/Testing effectiveness.

Course Contents:

1. Quality assurance concepts
1. Quality in the project manager's triangle
2. Quality assurance vs. quality control
3. System/software processes
4. Active static testing
5. Test planning value

Course Assessment

- Coursework   30%
- Examination   70%

References

- Software Testing and Quality Assurance: Theory and Practice, Kshirasagar Naik and Priyadarshi Tripathy
- Software Quality Assurance, Alain April and Claude Yvon Laporte

Course Title: Web Applications 3(2,0,3)

Pre requisite: Internet Technologies

Course Description:

This course cover conceptual and practical knowledge, and skills required to develop web applications.

Course Objective:

- Equip students with the necessary knowledge to design and implement internet applications.
- Emphasizes on the specific technologies of these applications and how to employ them in building effective and efficient applications.
- Familiarize the students with technical characteristics of the Internet protocols.

Course Objectives

- Perform analysis modeling and design modeling for web applications.
- Identify candidate tools and technologies for developing web applications.
- Develop user-interfaces for web applications.
- Develop design a complete client/server, database-intensive web-base application by using web2.0 techniques taught throughout this course web applications

Course content

- Web Essentials: Clients, Servers, and Communication
- HyperText Markup Language (HTML) for authoring web pages.
- Cascading Style Sheets (CSS) for supplying stylistic information to web pages.
- Database access through the web
- Host Objects: Browsers and the DOM
- Server-Side Programming
- PHP
- Web services

Course Assessment

- Coursework   30%
- Examination   70%

References

1. Jeffrey C. Jackson, Web Technologies: A Computer Science Perspective
2. Deitel P.J. and Deitel H.M. 2013, Internet & World Wide Web How to Program , Pearson Prentice Hall

Course Title: Web Services 3(2,0,3)

Pre requisite: -

Course Description:

Web services is a standardized way or medium to propagate communication between the client and server applications on the World Wide Web. This course will give a detailed insight into various components of web services like SOAP, WSDL, REST, and how they operate

Course Objective:

- To provide students with an opportunity to implement a network based application modeled in terms of a "Service Oriented Architecture.
- To provide students with a hands on experience with the full range of technologies that support service oriented approaches.
- To provide students with an opportunity to reflect on the differences between traditional client server, SOA, and Web service approaches to systems.

Course content

- Introduction to Web Services
- Services, descriptions, and messaging
- Coordination, Orchestration, and Choreography
- Advanced Messaging, Metadata, and Security
- Service Orientation Principles
- Application and Business Layers
- Service Orientated Analysis
- WS-BPEL
- WS-* Extensions

Course Assessment

- Coursework 30%
- Examination 70%

References

1. Service Design Patterns: Fundamental Design Solutions for SOAP/WSDL and RESTful Web Services, Robert Daigneau Publisher: Addison-Wesley Professional; 1 edition (November 4, 2011)

Course Title: Service Oriented Architecture 3(2,0,3)

Pre requisite: -

Course Description:

This course focuses on service-oriented architectural model and the service-orientation design paradigm. It will describe Service Oriented Architecture (SOA) concepts and principles, as well as quality considerations for developing modern software systems from a technical and organizational perspective.

Course Objective:

- Understand the main concepts and principles of SOA
- Understand and apply patterns for service design from the provider and requester perspectives
- Represent the design of the systems by means of the Unified Modelling Language (UML)
- To understand SOA challenges mainly regarding governance, testing and maintenance.

Course content

- Introduction to Service Oriented Computing, SOA Paradigm and service design principles
- Introduction to SOA Development LifeCycle
- Introduction to the main stages of SOA development and their associated challenges.
- SOA Planning and Service Analysis and Identification
- Pattern-Based Service Design
- Assessment of Challanges of SOA Development
- Main challenges of SOA

Course Assessment

- • Coursework 30%
- • Examination 70%

References

1. Web Services & SOA Principles and Technology, Second Edition, Michael P. Papazoglou.
2. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India.
3. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education.

Course Title: Agile Methods 3(2,0,3)

Pre requisite: Introduction to Software Engineering

Course Description:

The agile methods course will address what agile methods are, how they are implemented (correctly), and their impact on software engineering.

Course Objective:

- apply critical thinking in analyzing a software engineering method.
- analyze the tradeoffs in selecting a software engineering method.
- understand the practices and philosophies of agile methods.
- understand and apply Scrum.
- understand and apply Extreme Programming. 6. Ability to tailor an agile method to the needs of the project

Course content

- Agile Manifesto and Principles
- Scrum Overview
- Extreme Programming Overview
- XP Corollary Practices
- Agile Management Practices
- Agile Engineering Practices
- Tailoring and Improving Agile Methods
- Challenges in Adopting Agile Methods
- Tradeoffs for Software Engineering Methods
- Agile Methods and Software Process Frameworks

Course Assessment

- Coursework 30%
- Examination 70%

References

1. K. Beck and C. Andres, Extreme Programming Explained: Embrace Change, 2nd Edition, 2004.
2. B.W. Boehm and R. Turner, Balancing Agility and Discipline: A Guide for the Perplexed, 2004.

Course Title: Software Mobile Applications Developments 3(2,0,3)

Pre requisite: Introduction to Software Engineering

Course Description:

The agile methods course will address what agile methods are, how they are implemented (correctly), and their impact on software engineering.

Course Objective:

- Explain mobile devices, including their capabilities and limitations.
- Use current mobile platforms and their architectures.
- Develop mobile applications on a popular mobile platform.
- Evaluate development with another mobile platform

Course content

- Introduction to Mobile Computing
- Factors in Developing Mobile Applications
    - a. Mobile Software Engineering b. Frameworks and Tools c. Generic UI Development d. Android User
- Android Intents and Services
- Characteristics of Mobile Applications
- Synchronization and Replication of Mobile Data
- Correct Communications Model
- Android Networking and Web

Course Assessment

- Coursework   30%
- Examination   70%

References

1. Wei-Meng Lee, Beginning Android™ 4 Application Development, 2012 by John Wiley & Sons, Inc.,
2. Bill Phillips, Chris Stewart, Brian Hardy, and Kristin Marsicano, Android Programming: The Big Nerd Ranch Guide, Big Nerd Ranch LLC, 3rd edition, 2017

Course Title: Software Testing 3(2,0,3)

Pre requisite: Introduction to Software Engineering

Course Description:

This course will review the traditional software testing techniques that are applicable to any software product, as well as learn techniques for the paradigm of test-driven development.

Course Objective:

- Plan and apply the appropriate level of testing.
- Design specific and measurable test cases
- Use problem reporting techniques, metrics, and testing status reports
- Select and apply testing models, processes and practices
- Apply principles and practices of test-driven development

- ## Course content
  - Softwre Testing Life Cycle - (STLC)
  - Core Testing Concepts
  - Basics of testing
    - o Black box testing
    - o White box testing
  - Static techniques of Testing
  - Test-Driven Development
  - Functional Testing
  - Non-Functional Testing
  - Testing Best Practices

Course Assessment

- Coursework   30%
- Examination   70%

References

1. John Watkins, Simon Mills, Testing IT: An Off-the-Shelf Software Testing Process, 2nd edition, 2011, Cambridge University Press,
2. James Whittaker, Jason Arbon, Jeff Carollo, How Google Tests Software, 2012, Addison-Wesley,
3. Jez Humble, David Farley, Continuous Delivery: Reliable Software Releases through Build, Test, and Deployment Automation, 2010, Addison-Wesley,

Course Title :Introduction to Computer Science 3(2,0,3)
Pre-requisite: -

Course Description:

This module covers essential concepts of computer science at an introductory level. Students are introduced to the history and evolution of computing and to the impact of information technology on the society.

Course Objectives:

- Understand and distinguish the main historical milestones in the evolution of computer science
- Understand the impact of computer science in society in the past and in the future
- Understand and describe how computers perform basic operations
- Understand and describe simple problem-solving strategies and how these can be implemented through computers
- Understand general principles of networking, Internet and World WideWeb

Course Contents:

- Components of computing systems
- Introduction to modern computer systems
- Components of modern computers
- Basics of computer architecture
- Introduction to operating systems
- Introduction to problem solving, algorithms and programming
- Introduction to networks, Internet and World Wide Web
- Social aspects of computers and information technology

Course Assessment

- •   Coursework   30%
- •   Examination   70%

References

1.   Gilbert Brands, Introduction to Computer Science: A Textbook for beginners in Informatics, Createspace Independent Publishing Platform, United States (2013)
2.   Glenn Brookshear, Dennis Brylow, Computer Science: An Overview (What's New in Computer Science), Pearson; 13 edition (March 23, 2018).

Course title:Programming Fundamentals

Pre-requisite: Introduction to Computer Science

Course Description:

This course introduces the fundamental concepts of structured programming, and provides a comprehensive introduction to programming for computer science and technology majors. Topics include software development methodology, data types, control structures, functions, arrays, and the mechanics of running, testing, and debugging

Course Objectives:

- Describe how data are represented, manipulated, and stored in a computer.
- Categorize different programming languages and their uses.
- Understand and use the fundamental concepts of data types, structured programming, algorithmic design, and user interface design.
- Demonstrate a fundamental understanding of software development methodologies, including modular design, pseudo code, flowcharting, structure charts, data types, control structures, functions, and arrays.
- Develop projects that utilize logical algorithms from specifications and requirements statements.

Course Contents:

- Data representation, manipulation, and storage in a computer.
- Programming languages and their uses.
- Basic elements of C++ including variables and I/O statements
- Code arithmetic computations
- Compound conditions
- Program logic with pseudo code
- Top-down design of algorithms and structured programming.

Course Assessment

- Coursework   30%
- Examination   70%

References
1. Zak, Diane. Introduction to Programming with C++. Cengage Learning, 2013.
2. Kirch-Prinz, Ulla, and Peter Prinz. A complete guide to programming in C++. Jones & Bartlett Learning, 2002.

Course Title: Information Security3(2,0,3)

Pre requisite: -

Course Description:

This course provides an understanding of encryption principles and practices with an emphasis on applying those practices to better secure organizational communications.

Course Objectives

- Explain the three components of the NIST Cyber security Framework
- Apply the NIST Risk Management Framework (RMF) to tiered risk management
- Demonstrate proficiency in assessing enterprise security
- Demonstrate proficiency in assessing enterprise security risk and formulating technical recommendations
- Demonstrate proficiency in assessing tactical or systems security risk

Course Contents:

1. Basic Terms and Definitions.
2. Security Attacks, Mechanisms, and Services.
3. SYMMETRIC CRYPTOGRAPHY
   a. Classic Encryption Techniques (Substitution, Transposition, and Product).
   b. Steganograghy.
   c. Block Ciphers and Data Encryption Standard (DES).
   d. Block Ciphers Design Principles.
   e. Block Ciphers Modes of Operations.
4. Key Distribution and Confidentiality in Sym. Cry
5. PUBLIC-KEY CRYPTOGRAPHY/Encryption
   a. Principles and Concepts.
   b. The RSA Algorithm.
   c. Key Management

Course Assessment:

- Coursework   30%
- Examination   70%

References:

1. Jersey.Stalling, Cryptography and Network Security 3rd ed., Prentice Hall, Inc New 2007.:
2. Stalling, W. Network Security Essentials, applications and standards, Prentice Hall, Inc 2011

Course Title: Design and Analysis of Algorithms 3(2,0,3)

Pre requisite: Data Structure, Discrete Mathematics

Course Description:

Algorithms are the core of most technologies used in contemporary computers. Practical applications of algorithms are ubiquitous.

Course Objectives:

- Describe the major modern algorithms and selected techniques that are essential to today's computers.
- Decide on the suitability of a specific algorithm design technique for a given problem.
- Apply the algorithms and design techniques to solve problems, and mathematically evaluate the quality of the solutions

Course Contents:

1. Mathematical Foundations
2. Growth of Functions
3. Summations and Recurrences
4. Fundamental techniques for designing and analyzing algorithms,
5. asymptotic analysis;
6. divide-and-conquer algorithms,
7. greedy algorithms,

Course Assessment

- •   Coursework   30%
- •   Examination   70%

References

1. Cormen, T. H., Leiserson, C. E., Rivest, R. L., & Stein, C. (2009). *Introduction to Algorithms* (3rd ed.). MIT Press.

Course Title: Data Mining 3(2,0,3)

Pre requisite: -

Course Description:

Data Mining studies algorithms and computational paradigms that allow computers to find patterns and regularities in databases, perform prediction and forecasting, and generally improve their performance through interaction with data. It is currently regarded as the key element of a more general process called Knowledge Discovery that deals with extracting useful knowledge from raw data.

Course Objectives:

- To introduce students to the basic concepts and techniques of Data Mining.
- To develop skills of using recent data mining software for solving practical problems.
- Recall important pattern discovery concepts, methods, and applications
- Learn multiple distance or similarity measures for cluster analysis
- Building classification models and test the model

Course Contents:

- Introduction to Data Mining
    - Related technologies - Machine Learning, DBMS, OLAP, Statistics
    - Stages of the Data Mining Process
    - Data Mining Goals
    - Knowledge Representation Methods
- Data Warehouse and OLAP
- Data preprocessing
    - Data cleaning
    - Data transformation
    - Data reduction
    - Discretization and generating concept hierarchies
- Data preprocessing
- Data mining algorithms
- Advanced techniques, Data Mining software and applications
    - Text mining
    - Web mining

Course Assessment

- Coursework   30%
- Examination   70%

References

1. Han, J., Kamber, M., & Pei, J. (2011). Data mining: Concepts and techniques (3rd ed.). Waltham: Morgan Kaufmann
2. Witten, Frank, and Hall, Data Mining: Practical Machine Learning Tools and Techniques, 3rd Edition, 2011

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خامسا: مفررات تقانة المعلومات

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Course Title: Internet Technologies 3(2,0,3)
Pre requisite:

Course Description:

This course cover conceptual and practical knowledge, and skills required to develop web applications.

Course Objective:

- Understand the major areas and challenges of web programming. Distinguish web-related technologies.
- Use advanced topics in HTML5, CSS3, JavaScript
- Use a server-side scripting language, PHP
- Use a relational DBMS, MySQL
- Use PHP to access a MySQL database.
- Design and implement typical static web pages and interactive web applications.

Course content

- Advanced Topics in HTML, CSS3, JavaScript
- Dynamic Web Applications
    - 3-tier architecture for web applications
- Server-Side Scripting using PHP
    - Control statements, Strings and numbers, Arrays, Functions
- JavaScript and XML

Assessment
- Coursework   30%
- Examination   70%

References
3. Jeffrey C. Jackson, Web Technologies: A Computer Science Perspective
4. Deitel P.J. and Deitel H.M. 2013, Internet & World Wide Web How to Program , Pearson Prentice Hall

Course Title: Operating Sytems 3(2,0,3)

Pre requisite: Introduction to Computer Science

Course Description:

The purpose of this course is to provide students basic knowledge of operating systems, difference between the kernel and user modes, concepts of application program interfaces, methods and implementations of interrupts.

Course Objective:

- Explain the objectives and functions of modern operating systems.
- Describe how computing resources are used by application software and managed by system software.
- Describe reasons for using interrupts, dispatching, and context switching to support concurrency in an operating system.
- Evaluate the trade-offs in terms of memory size (main memory, cache memory, auxiliary memory) and processor speed.

Course content

- Introduction to Operating Systems, Computer System
- Structures, Operating System Structures
- Process Management
    - Processes and Threads, CPU Scheduling
    - Process Synchronization
- Storage Management
    - Deadlocks
    - Memory Management and Virtual Memory
- I/O Systems
- File Systems Implementation, I/O subsystems

Assessment

- Coursework   30%
- Examination   70%

References

1. Silberschatz and Galvin, "Operating System Concepts", Addison-Wesley Inc, 7th Edition (Sixth and Fifth editions are fine as well).
2. Andrew S.Tanenbaum,"Modern operating systems", Prentice Hall, second edition, 2001.
3. Stalling, "Operating system, internals and design principles", Prentice Hall, fourth edition, 2001..

Course Title : Free and Open Source Systems 3(2,2,0)

Pre requisite: Operating Systems

Course Description:

The course takes students through the history and current status of the FOSS world, and starts them exploring it, by connecting their personal experiences with corresponding FOSS projects. Students will experience finding and using Open Source Software projects. They also learn how to initiate a new project, or join and extend an existing project.

Course Objectives

- Able to recognize the benefits and features of Open Source Technology.
- Can identify the licensing of open source systems and make decisions on their use, based on an understanding of the legal, economical and technical issues.
- Can find open source projects related to a given development problem.
- Can install from source code an open source project and start using it.
- Can choose the correct license, development model, and development community for open source projects, and can initiate a new project or join an existing project.

Course Contents:

- Overview of Open Source System,
- Open source tools,
- Open source components,
- Open source methodology,
- Open Source Software Development Models,
- The FOSS Philosophy, Social and Cultural Impacts

Assessment:

- Coursework   30%
- Examination   70%

References:

1. Producing Open Source Software" by Karl Foge
2. Keith Haviland, DindGray ,"Unix system programming :A programming guide to software development",2nd edition.

Course title: Computer Networks 3(2,0,3)

Prerequisite: Introduction to Computer Science

Course Description:

This course highlight the principles and practice of computer networking, with emphasis on the Internet

Course Objective:

- Be familiar with importance of networking terms
- Know how do computer networks and internets operate,
- Describe various network topologies protocols and topologies
- Identify and use network transmission media;
- Explain the OSI/TCP model; and distinguish between LANs WANs,
- Knowing networks HUB,Switch,Router,
- identify and use IP addressing.

Course content

- Introduction and network tools.
- Transmission media and Asynchronous communication.
- Long distance communication and extending LANs
- Hardware and IP addresses
- LAN Topologies and Technology
- NICs and Ethernet networks.
- Internetworking, WAN Technologies and Routers.
- Long distance digital connection technologies.
- Network ownership, services, paradigm, and performance.
- IP datagram and datagram forwarding
- CMP and ARP Protocols.
- TCP: Reliable Transport Services

Course Assessment

- Coursework   30%
- Examination   70%

References:

1. Doglas E. Commer, Computer Networks and Internets: with Internet Applications, 2008.
2. M. P. Clark, "Network and Telecommunications", Wiley (2nd ed)
3. J. Dunlop & D. G. Smith, "Telecommunications Engineering", Chapman & Hall (3rd edition)

Course Title: Multimedia Technology 3(2,0,3)

Pre requisite: -

Course Description:

This course will explain the technologies underlying digital images, videos and audio contents, including various compression techniques and standards, and the issues to deliver multimedia content over the Internet.

Course Objective:

- formulate a working definition of interactive multimedia;
- demonstrate competence in using the authoring program HyperStudio;
- demonstrate the use of animation, digitized sound, video control, and scanned images;

Course content

1. Introduction to Multimedia Studies
2. Data Representation
3. Basic Compression Techniques
4. Video and Audio Data Compression Techniques
5. Internet Resources
6. Multimedia Networks and QoS Support
7. Multimedia Applications
8. Topics in Multimedia Technologies

Course Assessment

- • Coursework   30%
- • Examination   70%

References

1. Ze-Nian Li & Mark S. Drew. (2004). *Fundamentals of Multimedia.*. Upper Saddle River, NJ: Pearson Education

Course Title: Introduction to Information Systems (2,0,0)

Pre requisite: -

Course Description:

This course is designed to provide students with a foundational understanding of Information Systems (IS) as they apply to the computer industry.

Course Objectives:

- Describe the role of information systems in an organization,
- Understand and evaluate the components of an information system,
- Describe the role of databases and data warehouses in an organization,
- Understand the principles of networking underlying modern information systems,
- Identify appropriate technologies to support electronic commerce, decision making, and other organizational activities.
- Analyze organizational structures and information flow in an organization,

Course Contents:

- Introduction
    - Strategic role of IS for contemporary organizations.
- Organizational View.
    - Information-data-knowledge
- Management View
- Evolution of IT. Components
- System vulnerability.
- Business process management.
- Systems development life cycle (SDLC)

Course Assessment:

- Coursework   30%
- Examination   70%

References:

1. Information Systems Technology, Ross A. Malaga, ©2005 Prentice Hall.
2. Information Systems for Business by Belanger, France, Craig Van Slyke and Robert E Crossler. 2 nd Edition

Course Title: Systems analysis and design 1 3(2,2,0)
Pre requisite: Fundamentals of Information Systems

Course Description:

System analysis and design deal with planning the development of information systems through understanding and specifying in detail what a system should do and how the components of the system should be implemented and work together.

Course Objectives:

- Gather data to analyse and specify the requirements of a system.
- Design system components and environments.
- Build general and detailed models that assist programmers in implementing a system.
- Design a database for storing data and a user interface for data input and output, as well as controls to protect the system and its data.

Course Contents:

- An Introduction to Systems Development
- Approaches to Systems Development and Project Management
- Systems Analysis Activities
- Systems Planning Phase
- Lifecycle methodology,
- Systems Analysis Phase
- Data modeling,
- Traditional and structured tools for development

Course Assessment:

- • Coursework   30%
- • Examination   70%

References:

1. kendall&kendall،"system analysis and design sixth edition" , US ,2005
2. teffenyA.Hoffer , joey F.geory"modern systems analysis and design "

سابعا : مجالات المعرفة في العلوم الإنسانية والإدارية والإقتصادية

عنوان المقرر : مبادئ الإدارة (2,0,0)2
المقرر السابق : -

وصف المقرر:

يتضمن المقرر موضوعات ذات صلة بمفاهيم الإدارة ، الموارد البشرية ، تقنيات وطرق الإدارة المختلفة ، وعلاقة الإدارة بتقانة المعلومات .

اهداف المقرر:

- تزويد الطلاب بالمفاهيم الاساسية للادارة وتنمية استعداداتهم لتفهم الادارة.
- معرفة الطلاب للوظائف المختلفة للادارة.
- تعريف الطالب بالمنشئات وانواعها ووظائفها.

مفردات المقرر:

1. مفهوم الادارة واهميتها.
2. تطور الفكر الاداري.
3. البيئة الادارية.
4. وظائف الادارة.
5. الادارة بالاهداف.
6. ادارة الوقت.
7. اتخاز القرارات الادارية.
8. نظم ادارية مقارنة.
9. تعريف المنشئات وانواعها ووظائفها.
10. مفهوم نظم المعلومات الادارية.
11. مفهوم ادارة الجودة الشاملة

طريقة التقييم :
التمارين والإختبارات النظرية 30%
الإمتحان النهائي 70%

المراجع :
1. جاري ديسلر "اساسيات الادارة " دار المريخ ،الرياض،1992 م.
2. محمد عبد الله عبد الرحيم "اساسيلت الادارة والتنظيم "،الشركة العربية للنشر والتوزيع ،القاهرة ،1992 م.
3. Knoontzo.,Donnellweihtich "management "MCGrow ,hill ,US ,1980.
4. المغربي ،كامل وآخرون "اساسيات في الادارة"،الطبعة الاولى ،دار الفكر للطباعة ،الاردن ،1990 م.

عنوان المقرر : مهارات الإتصال(2,2,0)3
المقرر السابق : -

وصف المقرر:

يتضمن المقرر مبادى ومفهوم مهارات الاتصال وتقنياتها المختلفة .

اهداف المقرر:

- أن يطور الدارس قدراته الاتصالية والتواصلية
- أن يكون قادرا من التعامل بفاعلية مع الآخرين في مكان العمل والمجتمع
- أن يكون ناجحا في صياغة العلمية

مفردات المقرر:

- مفهوم عملية الاتصال وعناصره ،
- أنواع الاتصالات ، مهارات الاتصال مع الآخرين ،
- معالجة البيانات والمعلومات ،
- إعداد التقارير المتخصصة ، كتابة الرسائل بأنواعها ،
- إتقان فن الإلقاء (العرض والتقدير) ،إدارة الوقت ،
- بنا فريق العمل الناجح ، المقابلة والمعاينة والتفاوض ،
- مهارات حل المشكلات وتطور الذات ، تنمية التفكير الايجابي الرأسي والأفقي

طريقة التقييم :

التمارين والإختبارات النظرية 30%
الإمتحان النهائي 70%

المراجع :

1. د. شريف حموي ،"مهارات الاتصال" ، دار يافا العالمية 2003
2. د.محمد جهاد ،د.دلالهلارت ،"مهارات الاتصال الإنساني" 2008
3. توماس .ل.كويك، "بناء فريق عمل ناجح" ، 1999

Course TitleResearch Methodology3(2,2,0)
Pre requisite:

Course Description:

The aim of the course is to give students the tools to conceptualize their thesis in terms of research questions and design methodology, data collection and qualitative analysis.

Course Objectives:

- To formulate viable research questions.
- Principles of theory/model building and case selection
- To distinguish probabilistic from deterministic explanations
- The role of the comparison in controlling for variations
- The benefits and drawbacks of different methodologies

Course Contents:

- The goals of social science inquiry
- Elements of research design
- Choosing a methodology
- The comparative method
- Longitudinal analysis
- Data collection and analysis (research design)
- Methods of data collection
- Analyzing qualitative data

Course Assessment

- • Coursework   50%
- • Examination   50%

References

1. Kothari, C.R., Research Methodology –Methods and techniques, New Age International.
2. Donald R. Cooper and Pamela S. Schindler, Research methods, 9th Edition, Tata McGraw Hill, 2006.

Course Title: Proffessional Ethics 3(2,2,0)

Pre requisite:

Course Description:

This course is intended to give students a chance to reflect on the humanitarian, social, and professional impact of computer technology by focusing on ethical issues faced by and brought about by computing professionals, including those related to networking and the internet, intellectual property, privacy, security, reliability, and liability.

Course Contents:
- Introduction to Computer Ethics
- Introduction to Cyber Ethics
- Ethical Concepts and Ethical Theories
- computer crimes
- Professional Ethics
- privacy and copyright issue
- industrial espionage
- security control
- computer disasters
- introduction to law
- Contract law

Course Objectives:

Course Assessment:

- Coursework   30%
- Examination   70%

References

1. Sarah Hutchinson , Stacy c.sawyer ,"Computers and information systems" ,fifth edition, us ,2005
2. Rrepublic of sudan , ministry of justice , "information offence" , Act 2007
3. N. D. kapoor , "Element of merchantile law" , third edition ,delhi , India , 199