اللائحة الداخلية الجديدة

لكلية الحاسبات والمعلومات

جامعة الزقازيق

أولاً : الأهداف والأقسام والدرجات

مادة (1)

تهدف الكلية إلى تحقيق الأغراض الآتية :

1- إعداد المتخصصين في علوم الحاسبات و المعلومات و الشبكات و الوسائط المتعددة وبحوث العمليات ودعم القرار والمؤهلين بالأسس النظرية و منهجيات التطبيق بما يمكنهم من المنافسة العالمية في تطوير تقنيات الحاسبات و المعلومات .

2- إجراء الدراسات و البحوث العلمية و التطبيقية في مجال الحاسبات و المعلومات التي لها أثر مباشر على التنمية المتكاملة في المجتمع .

3- تقديم الأستشارات و المساعدات العلمية و الفنية للهيئات و الجهات التي تستخدم تقنيات الحاسبات و المعلومات و تهتم بصناعة و دعم اتخاذ القرار من خلال إنشاء وحدات ذات طابع خاص .

4- إعادة تأهيل خريجي الكليات المختلفة طبقا لحاجة سوق العمل في المجالات الحديثة للحاسبات و المعلومات و الشبكات و الوسائط المتعددة و ذلك بعقد دبلومات تطبيقية في المجالات المختلفة ذات العلاقة .

5- تعميق الوعي بإستخدام تقنيات الحاسبات و المعلومات في قطاعات و مؤسسات الدولة و رفع كفاءة إستخدامها عن طريق الدورات التدريبية المهنية المتخصصة.

6- الاشتراك مع الجهات المتخصصة لتطوير و تعريب برمجيات النظم و التطبيقات المختلفة .

7- تنظيم الندوات وعقد المؤتمرات العلمية فى مجال علوم الحاسبات والمعلومات بهدف تعميق المفاهيم و الأرتقاء بالمستوى العلمي بين الكوادر المتخصصة .

8- عقد الاتفاقيات العلمية مع الهيئات و المؤسسات المناظرة على المستوى المحلى و الإقليمي و العالمي بهدف تبادل الخبرات وإجراء البحوث المتعلقة بتخصصات الحاسبات و المعلومات .

9- إنشاء وحدات بحثية متخصصة في الفروع المختلفة لعلوم الحاسبات و المعلومات.

10- توفير و تدعيم وسائل النشر و البحث العلمي في شتى مجالات التخصص .

مادة(2)

تتكون الكلية من الأقسام العلمية التالية :

(1) قسم علوم الحاسب (Computer Science)

يدخل في اختصاصه تدريس وإجراء البحوث المتعلقة بالموضوعات و التخصصات العلمية التالية :

(أساسيات و مفاهيم علوم الحاسب ـ أساسيات لغات البرمجةـ البرمجة الهيكلية ـ البرمجة الشيئية ـ البرمجة المنطقيـة ـ نظرية و تصميم المترجمات ـ تحليل و تصميم الخوارزميات ـ اللغات الصورية و نظرية الآليات ـ نظم التشغيل ـ بناء و تنظيم الحاسبات ـ هياكل البيانـات وتنظيم الملفات ـ المعالجـة على التوازي والحاسبات الموزعـة ـ طرق إتصال الإنسان بالحاسب ـ الذكاء الأصطناعي ـ الشبكات العصبية ـ الخوارزميـات التطوريـة ـ معالجـة اللغـات الطبيعيـة ـ الترجمـة الآلية ـ نظم التعليم بالحاسب ـ المعلوماتية الحيوية ـ نظم التعليم الذكية ـ تعريب الحاسبات ـ برمجة التطبيقيات)

(2) قسم نظم المعلومات (Information Systems)

يدخل في اختصاصه تدريس وإجراء البحوث المتعلقة بالموضوعات والتخصصات العلمية التالية :

(نظم المعلومات ـ تحليل و تصميم النظم ـ تخزين وإسترجاع المعلومات ـ نظم قواعد البيانات ـ إستخلاص البيانات ـ قواعد البيانات الموزعة ـ نظم المعلومات الذكية ـ نظم معلومات الوسائط المتعددة ـ النظم الخبيرة ـ النظم المبنيـة على المعرفة ـ هندسة المعرفة ـ نظم دعم القرار ـ نظم المعلومـات الإداريـة ـ هندسة البرمجيات ـ نظم ميكنـة العمل المكتبي ـ نظم ميكنة المكتبات ـ نظم معلومـات إدارة الأزمـات ـ إقتصاديات نظم المعلومـات ـ نظم معلومات المؤسسات الإفتراضية و الشركات الرقمية ـ التجارة الإلكترونية ـ نظم معلومات الإنترنت ـ نظم المعلومات الإستراتيجية ـ إدارة مراكـز المعلومـات ـ مـستودعات البيانـات ـ منهجيـات تطـوير نظـم المعلومـات ـ نظـم أمـان المعلومات ـ هندسة النظم ـ نظم المعلومات الجغرافية ـ الإستشعار عن بعد ـ تحليل الصور الجوية ـ نظم تحديد المواقع الأرضية بإستخدام الأقمار الصناعية ـ قواعد البيانات الجغرافية ـ الكارتوجرافيا الرقمية والتجسيد المرئى ـ تقنيات جمع البيانات الجغرافية ـ التحليل والنمذجة الجغرافية ـ برمجة نظم المعلومات الجغرافية والإستشعار عن بعد ـ نظم المعلومات الجغرافية المحمولـة ـ تخطيط وإدارة نظم المعلومات الجغرافية ـ تطبيقـات نظم المعـلومات في كافة المجالات: الإدارية, المحاسبية, الطبية, الزراعية, العسكرية, الجغرافيةـ الخ....)

(3) قسم تكنولوجيا المعلومات (Information Technology)

يدخل في اختصاصه تدريس وإجراء البحوث المتعلقة بالموضوعات والتخصصات العلمية التالية :

(شبكات الحاسب و إداراتها ـ امـن الـشبكات ـ برمجـة الـشبكات ـ تراسـل البيانـات ـ تكنولوجيـا الإتصالات ـ معالجة الإشارات الرقمية و الضوئية ـ التعرف على الكلام و توليده ـ معالجة الصور ـ نظـم الرسـم بالحاسـب ـ الرسـوم المتحركـة ـ الواقـع الإفتراضـي ـ الوسـائط المتعـددة ـ تكنولوجيـا

الإنترنت و برمجتها ـ ضـغط البيانات ـ معماريات الحاسب – النظم الرقمية– فيزيـاء الإلكترونيـات ـ المعالجات الدقيقة و تطبيقاتها – النظم المدمجة – الإنسان الآلي و الرؤية بالحاسب).

(4) قسم دعم القرار (Decision Support)

يدخل في إختصاصه تدريس وإجراء البحوث المتعلقة بالمقررات والتخصصات التالية :

(أساسيات و مفاهيم و نظريات اتخاذ القرار ـ بحوث العمليـات ومنهجيـة دعم القـرار ـ البرمجـة الخطية و غير الخطية ـ البرمجة العشوائية و الديناميكية ـ نظرية الشبكات و تخطيط المشروعات ـ نظم صفوف الانتظار ـ البرمجة متعددة الأهداف والمعايير ـ أدوات و أساليب دعم القـرار ـ نظم مراقبة المخزون و الإنتاج ـ إدارة المشروعات ـ إدارة الأزمات و المخاطر ـ تطبيقات بحوث العمليات و دعم القرار – تطبيقات الحسابات الذكية في بحوث العمليات ودعم القرار – أساسيات و مفاهيم علم الإدارة – إدارة اللوجيستيات – النماذج الكمية في علم الإدارة والإقتصاد – الإقتصاد الهندسى ـ الإدارة الاستراتيجية ـ نظرية المباريات ـ النمذجة و المحاكاة – إدارة الموارد البشرية والسلوك التنظيمي ـ النماذج التطبيقية لبحوث العمليات في كافة المجالات الإقتصادية, السياسية, الإجتماعية, العسكرية, ... الخ).

ويجوز أن تنشأ بالكلية أقسام أخرى وفقاً لقانـــون تنظيــم الجامعــــات

مادة(3)

أولاً: تمنح جامعة الزقازيق بناء على طلب مجلس الكلية الدرجات العلمية و الدبلومات الآتية :

(1) درجة بكالوريوس الحاسبات و المعلومات في إحدى التخصصات التالية :

1- علوم الحاسب .

2- نظم المعلومات .

3- نظم المعلومات الجغرافية والإستشعار عن بعد .

4- تكنولوجيا المعلومات

5- دعم القرار .

(1مكرر) درجة البكالوريوس فى احدى التخصصات التالية بنظام الساعات المعتمدة:

1- إدارة تقنية المعلومات وجميع التفاصيل الخاصة بهذا البرنامج مبينه بالملحق رقم 4

2- هندسة البرمجيات وجميع التفاصيل الخاصة بهذا البرنامج مبينه بالملحق رقم 5

3- نظم المعلومات الجغرافية والاستشعار عن بعد وجميع التفاصيل الخاصة بهذا البرنامج مبينه بالملحق رقم 6

(2) درجة ماجستير الحاسبات و المعلومات في إحدى التخصصات التالية :

1- علوم الحاسب .

2- نظم المعلومات .

3- نظم المعلومات الجغرافية والإستشعار عن بعد .

4- تكنولوجيا المعلومات .

5- دعم القرار .

(3) درجة دكتوراة الفلسفة في الحاسبات و المعلومات في احدي التخصصات التالية :

1- علوم الحاسب .

2- نظم المعلومات .

3- نظم المعلومات الجغرافية والإستشعار عن بعد .

4- تكنولوجيا المعلومات .

5- دعم القرار .

(4) دبلومات الدارسات العليا التخصصية في الحاسبات و المعلومات في التخصصات التالية :

أولاً : دبلومات علوم الحاسب

1- دبلوم علوم الحاسب .

ثانياً : دبلومات نظم المعلومات

1- دبلوم نظم المعلومات.

2- دبلوم التجارة الإلكترونية .

3- دبلوم نظم المعلومات الجغرافية و الإستشعار عن بعد .

ثالثاً : دبلومات تكنولوجيا المعلومات

1- دبلوم تكنولوجيا المعلومات .

رابعاً : دبلومات دعم إتخاذ القرار

1- دبلوم بحوث العمليات و دعم القرار.

2- دبلوم إدارة وجدولة المشروعات.

3- دبلوم إدارة المخاطر والأزمات.

(5) دبلوم الدراسات العليا العام في الحاسبات و المعلومات (لغير المتخصصين في الحاسبات و المعلومات).

(6) الدبلوم المهنى التخصصي في تكنولوجيا المعلومات و الحاسبات بنظام الساعات المعتمدة وجميع التفاصيل الخاصة بهذا البرنامج مبينه بالملحق رقم 7

على أن يوضح التخصص العام في الشهادة ، ويضاف لذلك موضوع الرسالة في حالة الماجستير و دكتوراة الفلسفة.

ثانياً: يجوز أن تنظم الكلية برامج الدراسات العليا المؤهلة للدرجات العلمية و الدبلومات المشار إليها في هذه المادة بالمشاركة مع الكليات المناظرة بالجامعات الأخرى الخاضعة لقانون تنظيم الجامعات المصرية أوبالمشاركة مع الجامعات الأجنبية .

ثالثاً : يجوز أن تمنح الجامعة بناء على طلب مجلس الكلية هذه الدرجات العلمية و الدبلومات في تخصصات أخرى وفقاً لأحكام قانون تنظيم الجامعات .

رابعاً : للكلية الحق فى تحصيل مقابل خدمات من الطلبة الدارسين فى التخصصات التى تحتاج الى تطبيقات عملية مكثفة وذلك بناءا على اقتراح مجالس الاقسام المختصة وموافقة مجلس الكلية ومجلس الجامعة.

ثانياً : مرحلة البكالوريوس

مادة(4)

قواعد القبول :

1- يتم قبول الطلاب للدراسة بالكلية بناء على القواعد التي يحددها مكتب تنسيق القبول بالجامعات كل عام من بين الطلاب الحاصلين على الثانوية العامة أو ما يعادلها على أن يكون قد درس مقرر الفيزياء و مقرر رياضة (2) .

2- يجوز أن يعفى الطالب المحول للكلية من كلية جامعية أو معهد علمي مناظر معترف به من أداء الإمتحان في بعض المقررات الدراسية بعد إجراء مقاصة بمعرفة الأقسام المختصة و إعتمادها من مجلس الكلية إذا ثبت انه أدى بنجاح إمتحانات تعادلها في الكلية أو المعهد المنقول منه و يكون الإعفاء بقرار من رئيس الجامعة بعد موافقة مجلس شئون التعليم و الطلاب بناء على إقتراح مجلس الكلية بعد أخذ رأى مجالس الأقسام المختصة .

مادة (5)

نظام الدراسة :

1- النظام الدراسي المتبع هو النظام الفصلي الذي يقسم فيه العام إلى فصلين دراسيين متتالين .

2- الدراسة باللغة الإنجليزية في كل المقررات التخصصيه بجميع الفرق الدراسية .

3- مدة الدراسة لنيل درجة البكالوريوس أربع سنوات دراسية مقسمة على ثمانية فصول دراسية بالإضافة إلى التدريب الصيفي الذي يحدده مجلس الكلية .

4- مدة الفصل الدراسي 15 أسبوعا يتبعها إمتحان تحريري لكل فصل دراسي على حده .

5- يدرس الطالب في الفرقة الأولى و الثانية و الثالثة دراسة موحدة يتبعها دراسة لمدة عام للسنة النهائية في أحد الأقسام العلمية التخصصية الموضحة في المادة (2) و ذلك طبقا لما هو وارد في جدول خطة و مقررات الدراسة المتبعة في هذه اللائحة .

6- يضع مجلس الكلية القواعد المنظمة لقبول الطلاب فى التخصصات المختلفة .

7- يقوم طلاب الفرقة النهائية باعداد مشروع ممتد على الفصلين الدراسيين و تحدد مجالس الأقسام المختصة موضوعه و يقوم مجلس الكلية بناء على إقتراح مجالس الأقسام المختصة بتشكيل لجان لمناقشة المشاريع شفهيا و تقييمها على أن تتم المناقشة و التقييم للمشروع على مرحلتين أولاهما مع بداية الفصل الدراسى الثانية والثانية فى خلال فترة يحددها مجلس الكلية بعد امتحان نهاية الفصل الدراسى الثانى بمدة لا تزيد عن شهر .

8- يكلف الطلاب المنقولون الى الفرقة الثانية و الثالثة بحضور فترة تدريب صيفي خلال الأجازة الصيفية لمدة شهر على الأقل داخل الكلية . كما يكلف الطلاب المنقولون الى الفرقة النهائية بحضور فترة تدريب خلال الأجازة الصيفية لمدة شهر على الأقل في إحدى الجهات المتصلة بتخصصهم . على أن تقوم الأقسام العلمية المختصة و بموافقة مجلس الكلية بتحديد نظام و محتوى التدريب وأماكن التدريب و نظام توزيع الطلاب و نظام المتابعة على أن يتم تقييم الطلاب شفهيا فى نهاية فترة التدريب . و لا تمنح شهادة التخرج إلا للطلاب الذين أتموا التدريب العملى بنجاح .

9- يعامل الطالب الذى يؤدى امتحان أى مقرر من الخارج على مجموع درجتى التحريرى والعملى / الشفهى فقط, أو تضاف له آخر درجة أعمال فصل حصل عليها قبل أدائه الامتحان من الخارج إذا كان ذلك فى مصلحته.

مادة(6)

نظام الامتحانات :

1- تعقد إمتحانات النقل وإمتحانات البكالوريوس فى نهاية كل فصل دراسى فى المقررات التى درسها الطالب فى فرقته طبقا للجداول الواردة فى الملحق رقم (1) من هذه اللائحة و تكون الأمتحانات تحريرية و شفهية في جميع المقررات بالإضافة إلى الأمتحانات العملية في المقررات التي بها تطبيقا عمليا و يعتبر الطالب راسبا إذا لم يؤدى الأمتحان التحريرى و كذلك يعتبر راسبا فى المشروع إذا لم يحضر المناقشة أو قررت اللجنة رسوبه.

2- يحرم الطالب من أداء الإمتحان التحريرى لأى مقرر ما لم يكن مستوفيا للحد الأدنى لنسبة الحضور و هى 75% من عدد المحاضرات النظرية و الدروس العملية و يكون ذلك بقرار من مجلس الكلية بناء على طلب مجلس القسم المختص و يعتبر الطالب راسبا فى المقررات التى حرم من التقدم للإمتحان بها .

3- يعتبر الطالب ناجحا إذا نجح فى جميع مقررات فرقته بإستثناء المواد التى لا تحتسب ضمن مواد الرسوب .

4- ينقل الطالب من الفرقة المقيد بها إلى الفرقة التى تليها إذا كان راسبا فيما لا يزيد عن مقررين من مقررات فرقته أو من مقررات الفرق الأدنى فرقته بإستثناء المواد التى لا تحتسب ضمن مواد الرسوب .

5- إذا تضمن الامتحان في أحد المقررات أمتحانا تحريريا و آخر عمليا أو شفهيا فإن درجة الطالب في هذا المقرر هى مجموع درجات الأمتحان التحريرى و العملى و الشفهى بالإضافة إلى الأعمال الفصليه بشرط حصول الطالب على الأقل على 30% من درجة الأمتحان التحريري أما إذا لم يحصل على 30% فإن درجته فى المادة هى درجة الإمتحان التحريري فقط و يعتبر الطالب الغائب فى الامتحان التحريرى غائبا و لا ترصد له درجة فيه .

6- تعقد إمتحانات الدور الثانى فى شهر سبتمبر من كل عام لطلبة الفرقة الرابعة الراسبين فيما لا يزيد عن مقررين بخلاف المواد التى لا تحتسب ضمن مواد الرسوب .

7- يؤدى الطالب الأمتحان فيما رسب فيه من مقررات مع طلاب الفرقة التى تدرس بها هذه المقررات و فى حالة حصول الطالب على 65% فاكثر من الدرجة تخفض درجته الى الحد الأقصى لتقدير مقبول .

8- اذا كان الطالب متغيبا عن إمتحان المادة بعذر يقبله مجلس الكلية فيحتسب له التقدير و الدرجة التى يحصل عليها فى الإمتحان كما هى .

مادة(7):

يقدر نجاح الطالب فى المقررات وفى التقدير العام لمرحلة البكالوريوس بإحدى التقديرات الآتية :

ممتــــاز	:	من 85% فاكثر من مجموع الدرجات .
جيد جداً	:	من 75% الى اقل من 85% من مجموع الدرجات .
جيـــــد	:	من 65% الى اقل من 75% من مجموع الدرجات .
مقبـــول	:	من 50% الى اقل من 65% من مجموع الدرجات .

أما رسوب الطالب فيقدر بإحدى التقديرين الآتيين :

| ضعــــيف | : | من 30% الى اقل من 50% من مجموع الدرجات . |
| ضعيف جدا | : | اقل من 30% من مجموع الدرجات . |

ويحسب التقدير العام للطلاب فى مرحلة البكالوريوس على أساس المجموع التراكمى للدرجات التى حصلوا عليها فى كل السنوات الدراسية كما يتم ترتيبهم وفقا لهذا المجموع . ويمنح الطالب مرتبة الشرف إذا كان ترتيبه النهائى ممتازا أو جيد جدا على ألا يقل تقديره العام فى أى فرقة من فرق الدراسة عن جيد جدا و يشترط لحصول الطالب على مرتبة الشرف ألا يكون قد رسب فى أى أمتحان تقدم له فى أى فرقة .

مادة(8)

1- تبين الجداول الواردة فى ملحق(1) من هذه اللائحة المقررات الدراسية و عدد الساعات الدراسية المخصصة للمحاضرات و التمارين و المعامل وعدد ساعات الأمتحان التحريري و العملى و الشفهى المخصصة و توزيع الدرجات لكل مقرر موزعة على الفصلين الدراسيين .

2- تحدد مجالس الأقسام المختصة الموضوعات التى تدرس فى كل مقرر و يصدر بإعتمادها قرار من مجلس الكلية . كما يقوم عميد الكلية بالإشراف على المقررات التى ليس لها أقسام علمية بالكلية . وتقوم الأقسام العلمية بمراجعة المحتوى العلمى للمقررات الدراسية بصفة مستمرة لتطويره سواء بالحذف أو بالاضافة أو التغيير تمشيا مع التطور العالمى لهذه المقررات.

مادة(9)

يجوز لمجلس الكلية بعد موافقة مجلس القسم المختص أن يقبل خريجى كليات الحاسبات والمعلومات الحاصلين على البكالوريوس فى الحاسبات و المعلومات فى إحدى التخصصات بالكلية و ذلك للحصول على درجة البكالوريوس فى الحاسبات و المعلومات فى تخصص أخر و في هذه الحالة يلتزم الطالب بدراسة جميع مقررات الفرقة الرابعة للتخصص الذى يرغب دراسته حتى ولو كان قد درس بعضها على أن يتحمل الطالب المصاريف الدراسيه الفعليه التى يتم تحديدها بمعرفة مجلس الكليه وموافقة مجلس الجامعه .

مادة(10)
أحكام انتقالية :

1- تطبق الأحكام الواردة بهذه اللائحة إعتبارا من العام الجامعى التالى لإقرارها على الطلاب المقيدين بالفرقة الأولى و يتم التطبيق تدريجيا بعد ذلك, و يستمر باقى الطلاب الملتحقين بالكلية فى السنوات الأعلى على إقرار هذه اللائحة فى الدراسة طبقا للائحة التي قبلوا في ظلها حتى يتم تخرجهم .

2- تعرض الحالات التى قد تظهرأو لم يرد بشأنها نص فى هذه اللائحة على مجلس الكلية لإتخاذ قرار بشأنها .

ثالثاً : الدراسات العليا

مادة(11)

تمهيد :

1- تقوم مجالس الأقسام العلمية بالكلية بوضع خطتها البحثية لخمس سنوات متزامنة مع خطة البعثات الخارجية و يجب أن ترتبط الخطة مع الصناعة و القطاعات الإنتاجية و الخدمية للمناطق و المحافظات المحيطة بالجامعة ومع خطط التنمية الشاملة للدولة و المشاكل البيئية ومع سد إحتياجات القسم من أعضاء هيئة التدريس و تعرض خطط الأقسام على مجلس الكلية لإقرارها.

2- تقوم مجالس الأقسام العلمية بتحديد ما يلزم لإستكمال البنية الأساسية للبحث العلمي بها و تشمل المعدات و الأجهزة و الأدوات وما يلزمها من عناصر فنية مدربة و تقوم الكلية و الجامعة بتوفير التمويل اللازم في حدود الميزانية المتاحة ويتابع مجلس القسم ومجلس الكلية تنفيذ هذه الخطط.

3- تكون موضوعات رسائل درجات الماجستير و دكتوراة الفلسفة من خطط الأقسام البحثية.

4- تتكون الخطط البحثية للكلية من الخطط البحثية للأقسام ويراعى محاولة التنسيق مع كليات الحاسبات و المعلومات الأخرى بما يخدم الصناعة و خطط التنمية.

5- ترتبط الخطط الدراسية لدبلومات الدراسات العليا و مقررات الماجستير و دكتوراة الفلسفة الموضوعة و المستحدثة بنوعيات الصناعة و خطط التنمية و متطلبات البيئة و المناطق المحيطة بما يدعم الربط بين الكلية و المجتمع و يشجع العاملين بها على الإلتحاق بالدراسات العليا بالكلية كذلك يفضل أن تشتمل مقررات الدبلوم على حلقات النقاش و مشروع تطبيقي وأن يتم وضع مقررات إختيارية و التوسع فيها.

أولاً : دبلوم الدراسات العليا

مادة (12)

تمنح جامعة الزقازيق بناءا على طلب مجلس كلية الحاسبات والمعلومات درجة دبلوم الدراسات العليا في الحاسبات والمعلومات في إحدى التخصصات المبينة في المادة رقم (3) على أن يوضح التخصص في الشهادة.

مادة (13)

قواعد القبول:

1- يتم الإعلان عن الدبلوم داخليا و خارجيا بإحدى الجرائد الرسمية في النصف الأول من شهر أغسطس و تقبل طلبات قيد الطلاب حتى منتصف شهر سبتمبر من كل عام، و تبدأ الدراسة في الأسبوع الأول من شهر أكتوبر.

2- يشترط لقيد الطالب لدبلوم الدراسات العليا ما يلي:

أ ـ التفرغ بما لا يقل عن يومين أسبوعيا وذلك بموجب موافقة صريحة من جهة العمل التي ينتمي لها الدارس.

ب- الدبلومات التخصصية:

أن يكون حاصلاً على إحدى الدرجات العلمية التالية:

1- درجة البكالوريوس في الحاسبات و المعلومات في مجال التخصص من إحدى كليات الحاسبات والمعلومات بالجامعات المصرية أو على درجة معادلة لها من معهد علمي آخر معترف به من المجلس الأعلى للجامعات.

2- درجة البكالوريوس في مجال الحاسبات و المعلومات من إحدى الجامعات المصرية أو على درجة معادلة لها من معهد علمي آخر معترف به من المجلس الأعلى للجامعات. ويتم تقييم المواد والساعات التي درسها في مرحلة البكالوريوس ومدى مطابقتها لمجال التخصص من قبل مجلس القسم المختص و يعتمدها مجلس الكلية.

جـ- الدبلومات العامة:

أن يكون حاصلا على درجة البكالوريوس من إحدى الجامعات المصرية أو على درجة معادلة لها من معهد علمي آخر معترف به من المجلس الأعلى للجامعات.

مادة (14)

نظام الدراسة:

أ- الدبلومات التخصصيه:

1- مدة الدراسة لنيل دبلوم الدراسات العليا التخصصية هي فصلين دراسيين.

2- يقوم الطلاب بإعداد مشروع للتخرج على مدار الفصلين الدراسيين وتحدد مجالس الأقسام المختصة موضوعه ويقوم مجلس الكلية بناء على إقتراح الأقسام المختصة بتشكيل لجان مناقشة وتقييم المشاريع شفهيا .

3- تبين الجداول الواردة في ملحق(2) من هذه اللائحة المقررات الدراسية الخاصة بكل دبلوم.

ب- الدبلومه العامه:

1- مدة الدراسة لنيل دبلوم الدراسات العليا العامة في الحاسبات والمعلومات اربعة فصول دراسية

2- يقوم طلاب الفرقة الثانية بإعداد مشروع ممتد على فصلين دراسيين و تحدد مجالس الأقسام المختصة موضوعه ويقوم مجلس الكلية بناء على إقتراح مجالس الأقسام المختصة بتشكيل لجان مناقشة و تقييم المشاريع شفهيا.

3- تبين الجداول الواردة في ملحق (2) من هذه اللائحة المقررات الدراسية الخاصة بالدبلوم و توزيعها على الفصول الدراسية الأربعة.

مادة (15)

نظام الإمتحانات:

1- تعقد إمتحانات دبلوم الدراسات العليا بعد إنتهاء كل فصل دراسي في المقررات التي درسها الطالب طبقا للجداول الواردة في ملحق (2) من هذه اللائحة و تكون الإمتحانات تحريرية وشفهية في جميع المقررات عدا المشروع الذي تقدر درجاته من قبل اللجنة المختصة بناءاً على المناقشة الشفهية.

2- يعتبر الطالب ناجحا إذا نجح في جميع مواد فرقته.

3- يعتبر الطالب راسبا إذا لم يؤد الإمتحان التحريري وكذلك يعتبر راسبا في المشروع إذا لم يحضر المناقشة أو قررت اللجنة رسوبه.

4- يحرم الطالب من أداء الإمتحان التحريري لأي مقرر ما لم يكن مستوفيا للحد الأدنى لنسبة الحضور و هي 75% من عدد المحاضرات ويكون ذلك بقرار من مجلس الكلية بناءاً على طلب مجلس القسم المختص و يعتبر الطالب راسباً في المقررات التي حرم من التقدم للإمتحان بها.

5- يعقد خلال النصف الأول من شهر نوفمبر من كل عام إمتحان دور ثان لطلاب الفرقتين الأولى والثانية الراسبين في أي عدد من المقررات.

6- في حالة رسوب الطالب في أي من مقررات الدور الثاني يبقى للإعادة في فرقته على أن يؤدي الإمتحان في العام الذي يليه في المواد التي رسب فيها فقط.

7- لا تزيد درجة النجاح التي تحتسب للطالب في حالة نجاحه في أي مقرر سبق وأن رسب فيه عن الحد الأقصى لتقدير مقبول.

8- إذا كان الطالب متغيبا عن إمتحان المادة بعذر يقبله مجلس الكلية فيحتسب له التقدير و الدرجة التي يحصل عليها في الإمتحان كما هي.

9- يلغى قيد الطالب نهائيا في حالة رسوبه عامين متتاليين إلا إذا كان رسوبه نتيجة تغيبه عن الإمتحانات بعذر يقبله مجلس الكلية فلا تحتسب له أعوام التغيب بعذر ضمن أعوام الرسوب.

مادة (16)

تحسب تقديرات النجاح فى المقررات الدراسية والتقدير العام كالآتى:-

ممتاز   :   للحاصل على 90% فأكثر   من مجموع الدرجات.

جيد جدا   :   للحاصل على 80% إلى أقل من 90% من مجموع الدرجات.

جيد   :   للحاصل على 70% إلى أقل من 80% من مجموع الدرجات.

مقبول   :   للحاصل على 60% إلى أقل من 70% من مجموع الدرجات.

ويكون راسبا من يحصل على أقل من 60% من المجموع الكلى للدرجات.

ويتحدد التقدير العام لنجاح الطالب فى الدبلوم من مجموع درجات المواد الكلية التى درسها للحصول على الدبلوم.

مادة (17)

لا يقيد الطالب بالفرقة الواحدة لأكثر من سنتين.

ثانياً: درجة الماجستير

مادة (18)

تمنح جامعة الزقازيق بناء على طلب مجلس كلية الحاسبات والمعلومات درجة ماجستير الحاسبات والمعلومات في إحدى التخصصات المعلنة في مادة (3). على أن يبين في شهادة التخرج التخصص العام لفرع الدراسة وعنوان الرسالة.

مادة (19)

يشترط لتسجيل الطالب لدرجة الماجستير ما يلي:-

أ- أن يكون الطالب حاصلا على درجة البكالوريوس في الحاسبات والمعلومات بتقدير عام جيد على الأقل من إحدى كليات الحاسبات والمعلومات بالجامعات المصرية.

ب- يجوز تسجيل الطالب لدرجة الماجستير إذا كان حاصلا على درجة البكالوريوس في الحاسبات والمعلومات من إحدى كليات الحاسبات والمعلومات او المعاهد العلمية الموجودة خارج مصر بعد معادلتها من قبل المجلس الأعلى للجامعات.

ج- يجوز تسجيل الطالب لدرجة الماجستير إذا كان حاصلا على دبلوم الدراسات العليا التخصصية في الحاسبات والمعلومات من إحدى كليات الحاسبات المصرية بتقدير عام جيد علي الأقل, علي أن يكون القيد في التخصص المماثل للدبلوم الحاصل عليه الطالب.

د - أن يتفرغ الطالب للدراسة يومين دراسيين أسبوعيا ولمدة سنتين دراسيتين علي الأقل وذلك بموافقة جهة العمل.

ر - أن يستوفى الطالب الشروط الإضافية التي قد يضيفها القسم المختص للقبول.

مادة (20) :

يشترط لنيل درجه الماجستير أن يتابع الطالب الدراسة و البحث لمده سنتين دراسيتين علي الأقل وفقا للنظام الاتي :

(1) أن ينجح في الإمتحان الذي يعقد فى نهايه كل فصل دراسى من فصلى الدراسة للسنة الأولي وذلك في المقررات الدراسية التي تخدم موضوع البحث ويحددها مجلس القسم ويعتمدها مجلس

الكليه بناء على إقتراح المشرف من بين المقررات الدراسية المبينة في الملحق رقم (2) بواقع أربعة مقررات دراسية في كل فصل دراسي ومدة الدراسة في كل مقرر اربعة ساعات اسبوعيا.

(2) تعقد إمتحانات مقررات درجة الماجستير في نهاية كل فصل دراسي وفي حالة رسوب الطالب عامين يتم إلغاء تسجيله.

(3) يكون الإمتحان تحريريا فى جميع المقررات ويعتبر الطالب راسبا إذا لم يؤدى الامتحان التحريري

(4) تعلن نتائج كل فصل دراسى على حده ويكون التقدير العام للفصلين معا فى نهاية العام الدراسي

(5) يعقد خلال شهر نوفمبر من كل عام إمتحان دور ثان للطلاب الذين تخلفوا فيما لا يزيد عن مقرر واحد فقط وإذا تكرر رسوبهم إمتحنوا مع طلاب الفصل الدراسى الذى يدرس فيه هذا المقرر

(6) النهايه العظمى لدرجات الإمتحان التحريري النهائي في كل مقرر مائة درجه ومدة الإمتحان ثلاث ساعات

(7) يكون تقدير الطالب فى مادة التخلف بعد النجاح فيها مقبولا ما لم يكن متخلفا بعذر مقبول فيحصل على تقديره الفعلى

(8) يجرى الطالب بحثا فى الموضوع الذى يحدد مجاله فى استمارة القيد ويقدم رساله لنتائج هذا البحث بعد سنتين على الاقل من نجاحه في المواد الدراسيه تعرض على لجنة الحكم والمناقشه لتقويمها

مادة (21) :

يقدر نجاح الطالب فى المقررات الدراسيه والتقدير العام باحدى التقديرات الاتيه :

ممتاز	:	للحاصل على 90% فاكثر	من مجموع الدرجات .
جيد جدا	:	للحاصل على 80% الى اقل من 90%	من مجموع الدرجات.
جيد	:	للحاصل على 70% الى اقل من 80%	من مجموع الدرجات .
مقبول	:	للحاصل على 60% الى اقل من 70%	من مجموع الدرجات .

ويكون راسبا من يحصل على اقل من 60% من المجموع الكلى للدرجات .

ثالثاً : درجة دكتوراه الفلسفة

مادة (22):

تمنح جامعة الزقازيق بناء على طلب مجلس كلية الحاسبات والمعلومات درجة دكتوراه الفلسفة في الحاسبات والمعلومات في إحدى التخصصات المعلنة في ماده (3) على أن يبين في الشهادة التخصص العام لفرع الدراسة وعنوان الرساله.

مادة (23):

يشترط لقيد الطالب للحصول على درجة دكتوراه الفلسفه :

(1) أن يكون حاصلا على درجة الماجستير فى الحاسبات والمعلومات من إحدى كليات الحاسبات المصرية.

(2) يجوز تسجيل الطالب لدرجة دكتوراه الفلسفة إذا كان حاصلا على درجة الماجستير في الحاسبات والمعلومات من إحدى كليات الحاسبات والمعلومات او المعاهد العلمية الموجودة خارج مصر بعد معادلتها من قبل المجلس الأعلى للجامعات.

(3) أن يتفرغ للدراسه يومين إسبوعيا لمدة سنتين دراسيتين على الأقل بعد موافقة جهة العمل.

مادة (24):

يشترط لنيل الطالب درجة دكتوراه الفلسفة الآتى :

(1) أن ينجح الطالب في الإمتحان الذي يعقد في نهاية كل فصل دراسي من الفصلين الدراسيين للسنة الأولي للتسجيل وذلك في المقررات الدراسية التى تخدم موضوع البحث ويحددها مجلس القسم ويعتمدها مجلس الكلية بناء على إقتراح المشرفين من بين المقررات الدراسية في ملحق رقم (2) بواقع مقررين دراسيين في كل فصل دراسى ومدة الدراسة في كل مقرر أربعة ساعات أسبوعيا وعلى أن لا تكون هذه المقررات من بين المقررات التى درست في مرحلة الماجستير.

(2) تعقد إمتحانات مقررات درجة الدكتوراه في نهاية كل فصل دراسي وفي حالة رسوب الطالب عامين يتم الغاء تسجيله.

(3) يكون الإمتحان تحريريا في جميع المقررات ويعتبر الطالب راسبا إذا لم يؤد الإمتحان التحريري.

(4) تعلن نتائج كل فصل على حده ويكون التقدير العام للفصلين معا في نهاية العام.

(5) رسوب الطالب في أي مقرر يعتبر رسوب في جميع المقررات مالم يمكن رسوبه بعذر مقبول من مجلس الكلية.

(6) أن يجتاز الطالب الإمتحان الشامل والذى يعقد بعد الإنتهاء من المقررات الدراسية ويشكل له لجنه يقترحها مجلس القسم ويوافق عليها مجلس الكلية من خمس أساتذه أوأساتذه مساعدين من ضمنهم المشرف على أن يكون منهم إثنين على الأقل من خارج الكلية .

ولمجلس الكليه بعد أخذ رأي القسم وإقتراح اللجنه أن يعطى للطالب فرصة واحدة أخرى لإجتياز الإمتحان الشامل.

(7) أن يقوم بإجراء بحث علمي مبتكر يمثل إضافة جديدة فى المجال المحدد له وذلك فى حدود سنتين على الأقل من تاريخ إجتياز الإمتحان الشامل .

(8) أن يتقدم برساله بعد سنتين على الأقل من تاريخ إجتياز الإمتحان الشامل يتضمنها نتائج بحثه وتقبلها لجنة الحكم بعد مناقشتها علنا .

مادة (25):

يمنح الطالب درجة دكتوراه الفلسفة في التخصص على أن يوضح بالشهادة التخصص العام لموضوع الرسالة وعنوان الرسالة .

مادة (26):

يلغى قيد الطالب لدرجة دكتوراه الفلسفة في أي من الحالات الآتيه :

(1) إذا لم ينجح فى الإمتحان الشامل المذكور فى المادة (24) .

(2) إذا لم يتقدم بالرسالة خلال خمس سنوات من تاريخ قيده مع مراعاة حالات وقف القيد ويجوز أن يسمح له بسنه إستثنائيه بناء على تقرير المشرف الرئيسى الذى يقره مجلس القسم ومجلس الكلية وبإعتماد مجلس الدراسات بالجامعة.

(3) إذا تقدم المشرف أو المشرفون بطلب مسبب بإلغاء قيد الطالب و يقبله مجلس القسم ويعتمده مجلس الكليه وذلك بعد إخطار الطالب

(4) إذا رفضت لجنة الحكم الرسالة رفضا مطلقا

(5) إذا تقدم الطالب بطلب لإلغاء قيده

رابعاً : الدورات التدريبية

مادة (27) :

يجوز لمجلس الكليه وبأخذ رأى مجالس الأقسام المختصة أن تنظم دورات تدريبية ودراسات تخصصية لخدمة البيئة ويحدد مجلس الكليه قواعد تنظم هذه الدورات .

ملحق رقـم (1)

المقررات الدراسية لمرحلة البكالوريوس

النظام الكودى للمقررات الدراسية

يتكون كود أى مقرر (Course-code) من مجموعة من الأحرف أقصى اليسار تمثل الرمز الكودى للتخصص أو القسم كما هو موضح بالجدول التالى:

Group/Dept.	Code	التخصص أو القسم
- **Computer science**	**CS**	**علوم الحاسب**
- **Information systems**	**IS**	**نظم المعلومات**
- **Geographic Information systems**	**GIS**	**نظم المعلومات الجغرافية**
- **Information technology**	**IT**	**تكنولوجيا المعلومات**
- **Decision Support**	**DS**	**دعم القرار**
- **Electronic Commerce**	**EC**	**التجارة الإلكترونية**
- **General Diploma**	**GD**	**الدبلومة العامة**
- **Humanties**	**HU**	**إنسانيات**
- **Basic Science**	**BS**	**علوم أساسية**

– يتبع مجموعة الحروف رقم مكون من ثلاث خانات.

– الرقم فى خانة المئات يمثل الفرقة أو المستوى حيث أن الرقم 1 يدل على الفرقة الأولى والرقم 2 يدل على الفرقة الثانية والرقم3 يدل على الفرقة الثاالثة والرقم 4 يدل على الفرقة الرابعة والرقم 5 يدل على مرحلة دبلوم الدراسات العليا والرقم 6 يدل على مرحلتى الماجستير والدكتوراه.

الفرقة الأولى (عام)

الفصل الدراسي الأول

الكود code	إسم المقرر Course title	عدد الساعات الأسبوعية				الدرجـــــــات					ساعات الإمتحان
		محاضرة	عملي	تمارين	إجمالى	تحريري	عملي	شفهي	أعمال الفصل	مجموع	
HU100	اللغة الإنجليزية English Language	2	-		2	45			15	60	2
HU105	السلوك التنظيمي Organizational Behavior	2	1	1	4	80		20	20	120	3
BS110	الرياضيات Mathematics	4	1	1	6	120	20	20	20	180	3
IT100	فيزياء الإلكترونيات Electronic Physics	4	2		6	120	20	20	20	180	3
CS120	مقدمة في الحاسب Introduction to Computers	2	4		6	120	20	20	20	180	3
BS125	الإحصاء و الإحتمالات التطبيقية Applied Statistics and Probability	4	1	1	6	120	20	20	20	180	3

الفرقة الأولى (عام)

الفصل الدراسي الثاني

ساعات الإمتحان	الدرجـــــــــــــات					عدد الساعات الأسبوعية				Course title	إسم المقرر	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة			
3	150	40	20		90	5	2		3	Discrete Mathematics	الرياضيات غير المتصلة	BS150
3	120	20	20		80	4	1	1	2	Fundamentals of Management	أساسيات الإدارة	DS150
3	180	20	20	20	120	6		4	2	Structured Programming	البرمجة الهيكلية	CS150
3	180	20	20	20	120	6		4	2	Computer Skills for Personal Productivity	مهارات الكمبيوتر	IS150
3	150	40	20		90	5	1	1	3	Digital Logic Design	التصميم المنطقي	IT150
2	120	20	10	10	80	4	1	1	2	Report Writing and Presentation skills	كتابة التقارير و مهارات العرض	HU155

الفرقة الثانية (عام)

الفصل الدراسي الأول

ساعات الإمتحان	الدرجـــــــــات						عدد الساعات الأسبوعية				Course title	إسم المقرر	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري		إجمالى	تمارين	عملي	محاضرة			
3	150	20	20	20	90		5		2	3	Numerical Computing	الحسابات الرقمية	BS200
3	150	20	20	20	90		5		2	3	Operations Research	بحوث عمليات	DS200
3	150	20	20	20	90		5		2	3	Data Structures	هياكل البيانات	CS200
3	120	20	20		80		4	1	1	2	Fundamentals of Information Systems	أساسيات نظم المعلومات	IS200
3	150	20	20	20	90		5	1	1	3	Fundamentals of Economics and Feasibility Studies	أساسيات الإقتصاد ودراسات الجدوى	HU200
3	180	20	20	20	120		6		2	4	Computer Architecture and Assembly Language	معمارية الحاسب ولغة التجميع	IT200

الفرقة الثانية (عام)

الفصل الدراسي الثاني

ساعات الإمتحان	الدرجـــــــات					عدد الساعات الأسبوعية				Course title	إسم المقرر	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة			
3	180	20	20	20	120	6		3	3	Object Oriented Programming	البرمجة الشيئية	CS250
3	150	20	20	20	90	5	1	1	3	Analysis and Design of Algorithms	تحليل و تصميم الخوارزميات	CS255
3	180	20	20	20	120	6	1	2	3	Project Management	إدارة المشروعات	DS250
3	180	20	20	20	120	6		3	3	Database Concepts	مفاهيم قواعد البيانات	IS255
3	60	15			45	2			2	Human Rights and IT Ethics	حقوق الإنسان وأخلاقيات المهنة	HU250
3	150	20	20	20	90	5	1	1	3	Operating Systems	نظم التشغيل	CS260

الفرقة الثالثة (عام)

الفصل الدراسي الأول

ساعات الإمتحان	الدرجـــــــــــات					عدد الساعات الأسبوعية				إسم المقرر Course title	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة		
3	150	20	20	20	90	5		2	3	الذكاء الإصطناعي Artificial Intelligence	CS300
3	150	20	20	20	90	5		2	3	مبادئ نظم المعلومات الجغرافية Principle of Geographical Information Systems	GIS300
3	150	20	20	20	90	5		2	3	نظم إدارة قواعد البيانات Database Management Systems	IS300
3	150	20	20	20	90	5		2	3	الرسم بالحاسب Computer Graphics	IT300
3	150	20	20	20	90	5		2	3	شبكات الحاسب Computer Networks	IT305
3	150	20	20	20	90	5		2	3	تحليل وتصميم النظم (1) Systems Analysis and Design (1)	IS305

الفرقة الثالثة (عام)

الفصل الدراسي الثاني

الكود code	إسم المقرر Course title	عدد الساعات الأسبوعية				الدرجـــــــــات					ساعات الإمتحان
		محاضرة	عملي	تمارين	إجمالى	تحريري	عملي	شفهي	أعمال الفصل	مجموع	
IS350	تحليل وتصميم النظم (2) Systems Analysis and Design (2)	3	2		5	90	20	20	20	150	3
CS350	اللغات الصورية ونظرية الآليات Formal Languages and Automata	3	2		5	90	20	20	20	150	3
IT350	الوسائط المتعددة Multimedia Systems	3	2		5	90	20	20	20	150	3
IT355	تكنولوجيا الإنترنت و برمجتها Internet Technologies and Programming	3	2		5	90	20	20	20	150	3
IS355	النظم الخبيرة ونظم دعم القرار Expert Systems and Decision Support System	3	2		5	90	20	20	20	150	3
DS350	المحاكاة بالحاسب Computer Simulation Techniques	3	2		5	90	20	20	20	150	3

الفرقة الرابعة(علوم الحاسب)
Computer science

الفصل الدراسي الأول

ساعات الإمتحان	الدرجـــــــــــــات					عدد الساعات الأسبوعية				Course title إسم المقرر	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة		
3	150	20	20	20	90	5		2	3	نظم تشغيل متقدمة Advanced Operating Systems	CS400
3	150	20	20	20	90	5		2	3	تصميم المترجمات Compiler Design	CS405
3	150	20	20	20	90	5		2	3	المعلوماتية الحيوية Bioinformatics	CS410
3	150	20	20	20	90	5		2	3	الذكاء الحسابي Computational Intelligence	CS415
3	150	20	20	20	90	5		2	3	موضوعات مختارة في علوم الحاسب Selected Topics in Computer Science	CS420
3	150	100	50	-	-	5		4	1	المشروع Project I	CS450

الفرقة الرابعة (علوم الحاسب)
Computer science

الفصل الدراسي الثاني

ساعات الإمتحان	الدرجــــــــــــات					عدد الساعات الأسبوعية				إسم المقرر Course title	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة		
3	150	20	20	20	90	5		2	3	المعالجة على التوازى Parallel Processing	CS455
3	150	20	20	20	90	5		2	3	نظرية الحسابات Theory of Computations	CS460
3	150	20	20	20	90	5		2	3	التفاعل بين الإنسان و الكمبيوتر Human-Computer interaction Design	CS465
3	150	20	20	20	90	5		2	3	نظم أمان الكمبيوتر Computer Systems Security	CS470
3	150	20	20	20	90	5		2	3	موضوعات مختارة في علوم الحاسب Selected Topics in Computer Science	CS475
3	150	100	50	-	-	5		4	1	المشروع Project Π	CS450

الفرقة الرابعة (نظم المعلومات)
Information Systems

الفصل الدراسي الأول

الكود code	إسم المقرر Course title	عدد الساعات الأسبوعية				الدرجــــــــات					ساعات الإمتحان
		محاضرة	عملي	تمارين	إجمالى	تحريري	عملي	شفهي	أعمال الفصل	مجموع	
IS400	أستراتيجية نظم الأعمال الإلكترونية E-Business System Strategy	3	2		5	90	20	20	20	150	3
IS405	نظم قواعد البيانات الموزعة و المحمولة Distributed and Mobile Databases	3	2		5	90	20	20	20	150	3
IS410	أمان البيانات Information Security	3	2		5	90	20	20	20	150	3
IS415	إدارة خدمات المعلومات Information Services Management	3	2		5	90	20	20	20	150	3
IS420	موضوعات مختارة في نظم المعلومات Selected Topics in Information Systems	3	2		5	90	20	20	20	150	3
IS450	المشروع Project I	1	4		5	-	-	50	100	150	3

الفرقة الرابعة (نظم المعلومات)
Information Systems

الفصل الدراسي الثاني

ساعات الإمتحان	الدرجـــــــات					عدد الساعات الأسبوعية				إسم المقرر Course title	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة		
3	150	20	20	20	90	5		2	3	إستخلاص البيانات وإكتشاف المعرفة Data Mining and Knowledge Discovery	IS455
3	150	20	20	20	90	5		2	3	نظم معلومات الوسائط المتعددة و المكتبات الرقمية Multimedia Information Systems and Digital Libraries	IS460
3	150	20	20	20	90	5		2	3	تكنولوجيا الأعمال الإلكترونية E-Business Technologies	IS465
3	150	20	20	20	90	5		2	3	قواعد البيانات الموجهه Objected Oriented Databases	IS470
3	150	20	20	20	90	5		2	3	موضوعات مختارة في نظم المعلومات Selected Topics in Information Systems	IS475
3	150	100	50	-	-	5		4	1	المشروع Project П	IS450

الفرقة الرابعة (تكنولوجيا المعلومات)
Information Technology

الفصل الدراسي الأول

ساعات الإمتحان	الدرجـــــــــــات					عدد الساعات الأسبوعية				إسم المقرر Course title	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة		
3	150	20	20	20	90	5		2	3	الرسومات المتحركة Computer Animation	IT400
3	150	20	20	20	90	5		2	3	معالجة الإشارات الرقمية Digital Signal Processing	IT405
3	150	20	20	20	90	5		2	3	الشبكات اللاسلكية و المحمولة Wireless and Mobile Networks	IT410
3	150	20	20	20	90	5		2	3	الواقع الإفتراضي Virtual Reality	IT415
3	150	20	20	20	90	5		2	3	موضوعات مختارة في تكنولوجيا المعلومات Selected Topics in Information Technology	IT420
3	150	100	50	-	-	5		4	1	المشروع Project I	IT450

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الفرقة الرابعة (تكنولوجيا المعلومات)
Information Technology

الفصل الدراسي الثاني

ساعات الإمتحان	الدرجـــــــــــات					عدد الساعات الأسبوعية				إسم المقرر Course Title	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة		
3	150	20	20	20	90	5		2	3	مواجهات الحاسبات Computer Interfacing	IT455
3	150	20	20	20	90	5		2	3	أمان الشبكات Network Security	IT460
3	150	20	20	20	90	5		2	3	معالجة الصورة Image Processing	IT465
3	150	20	20	20	90	5		2	3	الإنسان الآلي Robotics	IT470
3	150	20	20	20	90	5		2	3	موضوعات مختارة في تكنولوجيا المعلومات Selected Topics in Information Technology	IT475
3	150	100	50	-	-	5		4	1	المشروع Project Π	IT450

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الفرقة الرابعة (دعم القرار)

Decision support

الفصل الدراسي الأول

ساعات الإمتحان	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة	Course title — إسم المقرر	الكود code
3	150	20	20	20	90	5		2	3	إدارة مشروعات متقدمة Advanced Project Management	DS400
3	150	20	20	20	90	5		2	3	نظرية القرارات و المباريات Decision and Game Theory	DS405
3	150	20	20	20	90	5		2	3	النماذج العشوائية في بحوث العمليات و إتخاذ القرار Stochastic Models in Operation Research and Decision Support	DS410
3	150	20	20	20	90	5		2	3	مراقبة المخازن و إدارة الإنتاج Inventory Control and Production Management	DS415
3	150	20	20	20	90	5		2	3	موضوعات مختارة في بحوث العمليات Selected Topics in Operation Research and Decision Support	DS420
3	150	100	50	-	-	5		4	1	المشروع Project I	DS450

الفرقة الرابعة (دعم القرار)

Decision Support

الفصل الدراسي الثاني

ساعات الإمتحان	الدرجـــــــــــات					عدد الساعات الأسبوعية				إسم المقرر Course title	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة		
3	150	20	20	20	90	5		2	3	الإدارة الإستراتيجية و إدارة الأزمات Strategic and Crisis Management	DS455
3	150	20	20	20	90	5		2	3	القرار وإدارة المخاطر Decision and Risk Management	DS460
3	150	20	20	20	90	5		2	3	البرمجة متعددة الأهداف Multiobjective Programming	DS465
3	150	20	20	20	90	5		2	3	الذكاء الحسابي في بحوث العمليات ودعم إتخاذ القرار Computational Intelligence in Operation Research and Decision Support	DS470
3	150	20	20	20	90	5		2	3	موضوعات مختارة في بحوث العمليات Selected Topics in Operation Research and Decision Support	DS475
3	150	100	50	-	-	5		4	1	المشروع Project Π	DS450

الفرقة الرابعة (نظم المعلومات الجغرافيه والإستشعار عن بعد)
(GIS and RS)

الفصل الدراسي الأول

ساعات الإمتحان	الدرجـــــات					عدد الساعات الأسبوعية				Course title — إسم المقرر	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة		
3	150	20	20	20	90	5		2	3	تصميم قواعد البيانات الجغرافية Geo Databases Design	GIS400
3	150	20	20	20	90	5		2	3	الكارتوجرافيا الرقمية والتجسيد المرئى Digital Cartography and Visualization	GIS405
3	150	20	20	20	90	5		2	3	تقنيات جمع البيانات الجغرافية ومراقبة الجوده Spatial Data Acquisition Techniques and Quality Standards	GIS410
3	150	20	20	20	90	5		2	3	مبادئ الإستشعار عن بعد Principles of Remote Sensing	GIS415
3	150	20	20	20	90	5		2	3	موضوعات مختارة في نظم المعلومات الجغرافية والإستشعار عن بعد Selected Topics in GIS/RS	GIS 475
3	150	100	50	-	-	5		4	1	المشروع Project I	GIS 450

الفرقة الرابعة (نظم المعلومات الجغرافيه والاستشعار عن بعد)
(GIS and RS)

الفصل الدراسي الثانى

ساعات الإمتحان	الدرجـــــــــات					عدد الساعات الأسبوعية				إسم المقرر Course title	الكود code
	مجموع	أعمال الفصل	شفهي	عملي	تحريري	إجمالى	تمارين	عملي	محاضرة		
3	150	20	20	20	90	5		2	3	التحليل والنمذجة باستخدام نظم المعلومات الجغرافية Spatial Analysis and Modeling using GIS	GIS455
3	150	20	20	20	90	5		2	3	برمجة نظم المعلومات الجغرافية GIS Programming and Customization	GIS460
3	150	20	20	20	90	5		2	3	نظم المعلومات الجغرافية الشبكية Web-based GIS	GIS465
3	150	20	20	20	90	5		2	3	إدارة وتنفيذ نظم المعلومات الجغرافية GIS Management and Implementation	GIS470
3	150	20	20	20	90	5		2	3	موضوعات مختارة في نظم المعلومات الجغرافية والإستشعار عن بعد Selected Topics in GIS/RS	GIS 475
3	150	100	50	-	-	5		4	1	المشروع Project II	GIS 450

ملحق رقم (2)

المقررات الدراسية لمرحلة

الدراسات العليا

أولاً

مقررات مرحلة دبلوم

الدراسات العليا

درجة الدبلوم العام في الحاسبات والمعلومات (لغير خريجي الكلية)

الدبلوم العام ـ العام الأول (الفصل الدراسى الأول):

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	الرياضيات غير المتصلة Discrete Mathematics	GDBS500
3	100	30	70	3	الإحصاء و الإحتمالات التطبيقية Applied Statistics and Probability	GDBS505
3	100	30	70	3	مهارات الكمبيوتر للإنتاجية Computers Skills for Personal Productivity	GDIS500
3	100	30	70	3	أساسيات نظم المعلومات Information Systems Fundamentals	GDIS505
3	100	30	70	3	التصميم المنطقي Digital Logic Design	GSIT500

الدبلوم العام ـ العام الأول (الفصل الدراسى الثانى):

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	البرمجة الهيكلية Structured Programming	GDCS500
3	100	30	70	3	تنظيم الحاسب ولغة التجميع Computer Organization and Assembly Language	GDIT505
3	100	30	70	3	النمذجه والمحاكاة Modeling and Simulation	GDDS500
3	100	30	70	3	تحليل وتصميم النظم Systems Analysis and Design	GDIS510
3	100	30	70	3	الذكاء الإصطناعي Artificial Intelligence	GDCS505

الدبلوم العام ـ العام الثانى (الفصل الدراسى الأول):

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	إسم المقرر Course Name	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	هياكل البيانات Data Structures	GDCS550
3	100	30	70	3	نظم التشغيل Operating Systems	GDCS555
3	100	30	70	3	أساسيات نظم المعلومات الجغرافيه Geographical Information Systems Fundamentals	GDIS550
3	100	30	70	3	شبكات الحاسب Computer Networks	GDIT550
3	100	30	70	3	البرمجة الشيئية Object Oriented Programming	GDCS560
-		100	-	3	المشروع Project	GD590

الدبلوم العام ـ العام الثانى (الفصل الدراسى الثانى):

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	إسم المقرر Course Name	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	نظم إدارة قواعد البيانات Database Management Systems	GDIS555
3	100	30	70	3	إدارة المشروعات Project Management	GDDS550
3	100	30	70	3	الرسم بالحاسب والوسائط المتعددة Computer Graphics and Multimedia	GDIT555
3	100	30	70	3	التجارة الإلكترونية E-commerce	GDIS560
3	100	30	70	3	النظم الخبيرة ونظم دعم القرار Expert Systems and Decision Support Systems	GDIS565
-		100	-	3	المشروع Project	GD590

الدبلومات المتخصصة :

1- دبلوم علوم الحاسب : (Computer Science)

الفصل الدراسي الأول :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	تصميم مترجمات متقدم Advanced Compiler Design	CS500
3	100	30	70	3	هندسة برمجيات متقدمه Advanced Software Engineering	CS501
3	100	30	70	3	نظم التشغيل المتقدمة Advanced Operating Systems	CS502
3	100	30	70	3	الذكاء الاصطناعي المتقدم Advanced Artificial Intelligence	CS503
3	100	100	-	3	المشروع Project	CS550

الفصل الدراسي الثاني :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	أداء نظم الحاسب Computer Systems Performance	CS551
3	100	30	70	3	نظرية التعقيد Complexity Theory	CS552
3	100	30	70	3	تصميم وتحليل الخوارزميات المتوازية Parallel Algorithm Design and Analysis	CS553
3	100	30	70	3	موضوعات متقدمة فى علوم الحاسب Advanced Topics in Computer Science	CS554
-	100	100	-	3	المشروع Project	CS550

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2- دبلوم نظم المعلومات الجغرافية و الإستشعار عن بعد : (GIS and RS)

الفصل الدراسي الأول :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	أساسيات نظم المعلومات الجغرافية GIS Fundamentals	GIS500
3	100	30	70	3	أساسيات الإستشعار عن بعد RS Fundamentals	GIS501
3	100	30	70	3	تقنيات جمع البيانات الجغرافية ومراقبة الجوده Spatial Data Acquisition Techniques and Quality Control	GIS502
3	100	30	70	3	التجسيد المرئى للمعلومات الجغرافية Visualization of Geographic Information	GIS503
3	100	100	-	3	مشروع Project	GIS550

الفصل الدراسي الثاني :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	التحليل والنمذجة الجغرافية المتقدمة Advanced Spatial Analysis and Modeling	GIS551
3	100	30	70	3	موضوعات مختارة فى نظم المعلومات الجغرافية Selected Topics in GIS	GIS552
3	100	30	70	3	إدارة وتنفيذ نظم المعلومات الجغرافية GIS Management and Implementation	GIS553
3	100	30	70	3	موضوعات مختارة في الإستشعار عن بعد Selected Topics in RS	GIS554
3	100	100	-	3	مشروع Project	GIS550

3ـ دبلوم التجارة الالكترونية :   Electronic Commerce

الفصل الدراسي الأول :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	مقدمة في التجارة الإلكترونية Information Systems: An E-Commerce Introduction	EC500
3	100	30	70	3	تكنولوجيا الإنترنت Web Technology: servers and software	EC501
3	100	30	70	3	برمجة الإنترنت Web Programming	EC502
3	100	30	70	3	تحليل وتصميم منطقى لهياكل الكائنات Object Structures Analysis and Logical Design	EC503
-	100	100	-	3	المشروع Project	EC550

الفصل الدراسي الثاني :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	نظم الإتصالات وأمان الإنترنت Telecommunications and Web Security	EC551
3	100	30	70	3	التصميم والتطبيق الفعلى لنظم إدارة قواعد النيانات DBMS: Physical Design and Implementation	EC552
3	100	30	70	3	إدارة مشروعات الإنترنت Project Management for Web Projects	EC553
3	100	30	70	3	موضوعات مختارة في التجارة الإلكترونية Selected Topics in E-Commerce	EC554
-	100	100	-	3	المشروع Project	EC550

4ـ دبلوم نظم المعلومات :   (Information System)

الفصل الدراسي الأول :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	إدارة نظم المعلومات Management of Information Systems	IS500
3	100	30	70	3	تحليل وتصميم نظم المعلومات Information Systems Analysis and Design	IS501
3	100	30	70	3	تراسل بيانات الأعمال Business Data Communications	IS502
3	100	30	70	3	تصميم قواعد بيانات Database Design	IS503
-	100	100	-	3	مشروع Project	IS550

الفصل الدراسي الثاني :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	إدارة قواعد بيانات Database Management and Administration	IS551
3	100	30	70	3	النظم الخبيرة ونظم دعم القرارات Expert Systems and Decision Support Systems	IS552
3	100	30	70	3	أمان المعلومات Information Security	IS553
3	100	30	70	3	موضوعات مختارة فى نظم المعلومات Selected Topics in Information Systems	IS554
-	100	100	-	3	مشروع Project	IS550

5- تكنولوجيا المعلومات :   (Information Technology)

الفصل الدراسي الأول :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	2	نكتولوجيا الإتصالات Communication Technology	IT551
3	100	30	70	2	عمارة الحاسب المتقدمة Advanced Computer Architecture	IT552
3	100	30	70	2	موضوعات مختارة Elective Course (1)	IT553
3	100	30	70	2	معالجة الإشارات الرقمية Digital Signal Processing	IT554
-	100	100	-	2	مشروع Project	IT550

الفصل الدراسي الثاني :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	2	ضغط البيانات Data Compression	IT500
3	100	30	70	2	نظم وسائط متعددة متقدمة Advanced Multimedia Systems	IT501
3	100	30	70	2	موضوعات مختارة Elective Course (2)	IT502
3	100	30	70	2	التعرف على الأنماط Pattern Recognition	IT503
-	100	100	-	2	المشروع Project	IT550

6- دبلوم دعم اتخاذ القرار: (Decision Support)

الفصل الدراسي الأول :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	تقنيات محاكاة الكمبيوتر Computer Simulation Techniques	DS500
3	100	30	70	3	تقنيات الجدولة Scheduling Techniques	DS501
3	100	30	70	3	القرار ونظرية المباريات Decision and Game Theory	DS502
3	100	30	70	3	حلقة بحث في بحوث العمليات Seminar in Stochastic Operations Research	DS503
-	100	100	-	3	مشروع Project	DS550

الفصل الدراسي الثاني :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	الحسابات الذكية في بحوث العمليات Computational intelligence in Operations Research	DS551
3	100	30	70	3	تطبيقات الحاسب في بحوث العمليات ودعم اتخاذ القرار Computer application in OR and DSS	DS552
3	100	30	70	3	الإدارة الاستراتيجية و إدارة الأزمات Strategic, Risk, and Crisis Management	DS553
3	100	30	70	3	النمذجه الخطيه والغير خطيه Linear and Nonlinear Optimization OR	DS554
-	100	100	-	3	مشروع Project	DS550

7- دبلوم إدارة المخاطر والأزمات: (Risk and Crisis Management)

الفصل الدراسي الأول :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	تقييم المخاطر وتحليلها Risk Assessment, Analysis and Evaluation	DS510
3	100	30	70	3	مقاومة المخاطر و التعامل معها Risk Treatment and Risk control	DS511
3	100	30	70	3	الصحه والأمان Occupational Safety and Health	DS512
3	100	30	70	3	النمذجه الكميه للمخاطر Quantitative Risk and Modeling	DS513
-	100	100	-	3	مشروع Project	DS550

الفصل الدراسي الثاني :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	تقنيات وخطط المخاطر Risk Technology Strategies	DS561
3	100	30	70	3	البيئه الصناعيه و الموارد البشريه فى المخاطر Industrial Environment and Human Resources in Risk	DS562
3	100	30	70	3	إستمرار العمل وإدارة الأزمات Business Continuity and Crisis Management	DS563
3	100	30	70	3	إدارة المخاطر Risk Management : Organization and communication	DS564
-	100	100	-	3	مشروع Project	DS550

8- دبلوم إدارة المشروعات: (Project Management)

الفصل الدراسي الأول :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	مقدمه لإدارة المشروعات Introduction to Project Management	DS520
3	100	30	70	3	مهارات النقل والإتصالات Communication Skills	DS521
3	100	30	70	3	دراسة الجدوى للمشروعات Feasibility study of projects	DS522
3	100	30	70	3	تخطيط وجدولة المشروعات Planning, Scheduling & Control	DS523
-	100	100	-	3	مشروع Project	DS550

الفصل الدراسي الثاني :

عدد ساعات الإمتحان	إجمالى الدرجات	درجات الإمتحان		عدد الساعات الأسبوعية	Course Name إسم المقرر	الكود
		أعمال الفصل	التحريري			
3	100	30	70	3	سلوكيات الموارد البشريه Human Relations and Behavior	DS571
3	100	30	70	3	رياضيات إدارة المشروعات Math for Project Management	DS572
3	100	30	70	3	تطبيقات الحاسب فى إدارة المشروعات Computer Applications in Project Management	DS573
3	100	30	70	3	إدارة المشروعات والتعاقدات Project Management and Contracts	DS574
-	100	100	-	3	مشروع Project	DS550

ثانياً

مقررات مرحلة الماجستير والدكتوراه

(1) مقررات الماجستير والدكتوراه في تخصص علوم الحاسب :

CS 600	Advanced Analysis of Algorithms	التحليل اللوغارتمي المتقدم
CS 601	Advanced Artificial Intelligence	الذكاء الاصطناعي المتقدم
CS 602	Advanced Cryptography and Computer Security	التشفير المتقدم وحماية الحاسب الالي
CS 603	Systems Software and Operating Systems	نظم التشغيل وبرمجة النظم
CS 604	Advanced Operating Systems	نظم التشغيل المتقدمة
CS 605	Advanced BioInformatics	المعلوماتية الحيوية المتقدمة
CS 606	Advanced Topics in Computer Science (I)	موضوعات متقدمة في علوم الحاسب 1
CS 607	Advanced Topics in Computer Science (II)	موضوعات متقدمة في علوم الحاسب2
CS 609	Advanced Compiler Design	تصميم المعالجات المتقدمة
CS 610	Complexity Theory	نظرية التعقيد
CS 611	Computer Arabization	تعريب الحاسب الالي
CS 612	Computer Human Interaction Design	تصميم التفاعل الانساني مع الحاسب الالي
CS 613	Computer Systems Performance	أداء نظام الحاسب الآلي
CS 614	Evolutionary Algorithms	طرق الحساب التطوري
CS 615	Fuzzy Logic and Intelligent Systems	المنطق المشوش والأنظمة الذكية
CS 617	Machine Learning	تعليم الالة
CS 618	Neural Networks	الذكاء الإصطناعي
CS 619	Parallel Algorithm Design and Analysis	تصميم وتحليل الحساب الموازي
CS 620	Programming Language Design	تصميم لغات البرمجة

(2) مقررات الماجستير والدكتوراه في تخصص نظم المعلومات

IS 600 Advanced Database Design

تصميم قواعد البيانات المتقدمة

IS 601 Advanced Database Management and administration

ادارة قواعد البيانات المتقدمة

IS 602 Database Application Design and Implementation

تنفيذ وتصميم تطبيقات قواعد البيانات المتقدمة

IS 603 Advanced Information systems analysis and design

تحليل و تصميم نظم المعلومات المتقدمة

IS 604 Object-Oriented Information Systems Design and Implementation

تصميم وتنفيذ نظم المعلومات الموجهة

IS 605 Distributed Database Management System

ادارة قواعد البياتات الموزعة

IS 606 Advanced Topics in Database Systems

موضوعات متقدمة فى قواعد البيانات

IS 607 Information Retrieval

استرجـــاع المعلومات

IS 608 Data Mining and Knowledge Systems

إستخلاص البيانات ونظم المعرفة

IS 609 Intelligent Information Systems

نظم المعلومات الذكية

IS 610 Knowledge Engineering

هندسة المعرفة

IS 611 Knowledge Management and Decision Systems

ادارة المعرفة ونظم القرارات

IS 612 Information system development methods and technologies

تكنولوجيا وطرق تطوير نظم المعلومات

IS 613 Legal and Ethical Issues in Information Systems

الأعتبارات الأخلاقية فى نظم المعلومات

IS 614 Managing Organizational information resources

إدارة موارد المعلومات

IS 615 Business Process Design and Implementation

تصميم وتطبيق إجراءات الأعمال

IS 616 Information Technology: Strategy and Management

إدارة تكنولوجيا المعلومات

IS 617 Quality Assurance of Information Systems

تأكيد جودة نظم المعلومات

IS 618 Information Risk Assessment and Security Management

إدارة تقييم مخاطر المعلومات

IS 619 Multimedia information Systems

نظم معلومات الوسائط المتعددة

IS 620 Financial Information Systems

نظم المعلومات المصرفية

IS 621 Designing and Developing Web-based Information Systems

تصميم وتطوير نظم المعلومات الشبكية

IS 622 Electronic Commerce Infrastructure

البنية التحتية للتجارة الإلكترونية

IS 623 Managing the Digital Firm	إدارة الشركات الرقمية
IS 624 Decision technologies for e-business	تكنولوجيا القرارات للأعمال الألكترونية
IS 625 E-commerce in the financial services industry	التجارة الألكترونية فى صناعة الخدمات المالية
IS 626 Technologies for B2B E-commerce	تكنولوجيا التجارة الألكترونية
IS 627 E-Business System Solution	حلول نظام العمل الألكترونى
IS 628 Information and Database System Security	أمان البيانات وقواعد المعلومات
IS 629 Information Systems Integration	تكامل نظم المعلومات
IS 630 Research Seminar in IS (I)	بحث دراسى فى نظم المعلومات 1
IS 631 Research Seminar in IS (II)	بحث دراسى فى نظم المعلومات 2
IS 632 Special Topics in Information Systems	موضوعات خاصة فى نظم المعلومات
IS 633 Advanced Software Engineering	هندسة برمجيات متقدمة

(3) مقررات الماجستير والدكتوراه في تخصص نظم المعلومات الجغرافية والإستشعار عن بعد

GIS 600 Geographic Information Science Theories, Models and Issues

موضوعات , نماذج , ونظريات علم المعلومات الجغرافية

GIS 602 Location Based Services and Web-based GIS

تحديد أماكن الخدمات و نظم المعلومات الجغرافية الشبكية

GIS 603 Spatial Data Acquisition Techniques

تقنيات جمع البيانات الجغرافية

GIS 604 Advanced Geographical Visualization Techniques

تقنيات التجسيد المرئى للمعلومات الجغرافية المتقدمة

GIS 605 Advanced Spatial Analyses and Modeling

التحليل والنمذجة الجغرافية المتقدمة

GIS 606 Advanced Spatial Database Design

تصميم قواعد البيانات الجغرافية المتقدمة

GIS 607 Spatial Data Mining

إستخلاص البيانات الجغرافية

GIS 608 Spatial Reasoning

الإستنباط الجغرافى

GIS 609 Spatio-Temporal Data Modeling

نمذجة البيانات الجغرافية المؤقتة

GIS 610 Reasoning with Uncertainty in Spatial Information Systems

الاستنباط الغير مؤكد لنظم المعلومات الجغرافية

GIS 611 Advanced Raster Modeling

النمذجة المتقدمة للبيانات الشبكية

GIS 612 GIS Network Modeling

نمذجة الشبكات باستخدام نظم المعلومات الجغرافية

GIS 613 Geocomputation

الحسابات الجغرافية

GIS 614 Geomatics and Digital terrain modeling

نمذجة التضاريس

GIS 615 GIS Data Models and Data Structures

هياكل و نماذج البيانات الجغرافية

GIS 616 GIS-based locational Modeling

نمذجة الاماكن باستخدام نظم المعلومات الجغرافية

GIS 617 GIS-based Environmental Modeling

النمذجة البيئية باستخدام نظم المعلومات الجغرافية

GIS 618 GIS_ Based Spatial Decision Support Systems

نظم دعم القرارات الجغرافية

GIS 619 Advanced GIS Management and Implementation

ادارة وتنفيذ نظم المعلومات الجغرافية المتقدمة

GIS 620 Research Seminar in GIS

حلقة بحثيه فى نظم المعلومات الجغرافية

GIS 621 Advanced Digital Remote Sensing

الإستشعار عن بعد متقدم

GIS 622 Radar Remote Sensing

الاستشعار عن بعد الرادارى

GIS 623 3D Data Capture and Ground LIDAR

تجميع البيانات باستخدام نظم الإستشعار عن بعد

GIS 624 Applied Remote Sensing

تطبيقات الإستشعار عن بعد

GIS 625 Global Positioning System Satellite Surveying Techniques

تحديد المواقع باستخدام الاقمار الصناعية

GIS 626 Urban and Environmental Applications of GIS/Remote Sensing

التطبيقات البيئية والمدنية لنظم المعلومات الجغرافية والإستشعار عن بعد

GIS 627 Remote Sensing and GIS for Petroleum

تطبيقات الإستشعار عن بعد ونظم المعلومات الجغرافية فى البترول

GIS 628 Research Seminar in RS

حلقة بحثيه فى الاستشعار عن بعد

GIS 629 Research Seminar in GIScience (I)

حلقة بحثيه في علم المعلومات الجغرافية 1

GIS 630 Research Seminar in GIScience (II)

حلقة بحثيه في علم المعلومات الجغرافية 2

GIS 631 Software Engineering Techniques in GIS

هندسة البرمجيات في نظم المعلومات الجغرافية

(4) مقررات الماجستير والدكتوراه في تخصص تكنولوجيا المعلومات

IT 601   Advanced Computer Networks

شبكات الحاسب المتقدمة

IT 602   Advanced Computer Graphics

الرسم بالحاسب المتقدم

IT 603   Advanced Virtual Reality

الواقع الإفتراضي المتقدم

IT 604   Communication Technology

تكنولوجيا الإتصالات

IT 605   Computer Forensics

مناظرات الحاسب

IT 606   Advanced Topics in Robotics and Computer Vision

موضوعات متقدمة في الإنسان الآلي والرؤيه بالحاسب

IT 607   Selected Topics in IT Π

موضوعات مختارة في تكنولوجيا المعلومات 2

IT 608   Computer Interfaces

مواجهات الحاسب

IT 609   Data Compression Techniques

تقنيات ضغط البيانات

IT 610   Advanced Digital Signal Processing

معالجة الإشارات الرقمية المتقدمة

IT 611   Image Processing

معالجة الصور

IT 612   Modern Computer Architectures

معمارية الحاسب الحديث

IT 613   Advanced Multimedia Systems

نظم الوسائط المتعددة المتقدمة

IT 614   Secure Network System Design

تصميم نظام شبكة آمنة

IT 615   Selected Topics in Information Technology-I

موضوعات مختارة في تكنولوجيا المعلومات 1

IT 616   Advanced Speech Processing

معالجة الكلام المتقدمة

IT 617   Wireless and Mobile Networks

اللاسلكى والشبكات النقالة

(5) مقررات الماجستير والدكتوراه في تخصص دعم القرار:

DS 600   Advanced Forecasting Techniques

تقنيات تنبؤ متقدمة

DS 601   Advanced Topics in Decision Analysis

موضوعات متقدمة في تحليل القرار

DS 602   Computational Intelligence in OR and DSS

تقنيات الحسابات الذكية في بحوث العمليات ودعم إتخاذ القرار

DS 603   Crisis Management

إدارة الأزمات

DS 604   Decision Theory

نظرية القرارات

DS 605   Deterministic Operations Research

بحوث العمليات الحتمية

DS 606   Discrete System Simulation

محاكاة النظم المنفصلة

DS 607   Feasibility Study

دراسة الجدوى

DS 608   Game theory

نظرية المباريات

DS 609   Human Resource Management

إدارة الموارد البشرية

DS 610   Integer Programming

البرمجة الصحيحة

DS 611   Judgment, Choice, and Decision Analysis

تحليل الحكم, الإختيار , وتحليل القرارات

DS 612   Linear Programming

البرمجة الخطية

DS 613   Management and Organization Structures

الإدارة وهيكلة المنظومة

DS 614   Military Operations Research

بحوث العمليات العسكرية

DS 615   Modeling Techniques

تقنيات النمذجة

DS 616   Multicriteria Decision Analysis

تحليل قرار المعايير المتعددة

DS 617   Network Modeling

نمذجة الشبكات

DS 618   Non-Linear Programming

البرمجة الغير خطية

DS 619 Principles of Command , Control, Communication, and Intelligence

نظم المحاكاة للتحكم والإتصال الذكى

DS 620   Production and Inventory Systems

نظم الإنتاج والمخزون

DS 621   Project Management

إدارة المشروعات

DS 622   Quantitave Methods

الطرق الكمية

DS 623   Queuing Theory

نظرية الطوابير

DS 624 Reliability Analysis

المعولية

DS 625   Risk Management

إدارة المخاطر

DS 626   Scheduling Techniques

تقنيات الجدولة

DS 627   Stochastic Operations Research

النماذج العشوائية في بحوث العمليات

DS 628   Stochastic Processes

العمليات العشوائية

DS 629   Strategies and Planning Management

إدارة التخطيط والإستراتيجيات

DS 630 Dynamic methods

الطرق الديناميكية

DS 631 Stochastic Programming

البرمجة العشوائية

ملحق رقـم (3)

محتويات المقررات الدراسية

المحتويات العلمية لمقررات

الإنسانيات والعلوم الأساسيه

HU100 English Language:

<div dir="rtl">

اللغة الإنجليزية

</div>

 The material reflects the stylistic variety that advanced learners have to be able to deal with. The course gives practice in specific points of grammar to consolidate and extend learners existing knowledge.

HU105 Organizational Behavior

<div dir="rtl">

السلوك التنظيمي

</div>

Perception, learning, motivation and value; individual differences and work performance; understanding yourself; motivating yourself and others, working within groups, achieving success through goal setting, achieving high personal productivity and quality; achieving rewarding and satisfying career; communicating with people; leading and influencing others; building relationships with supervisors, co-worker and customers. Recent correlated software packages should be used through labs.

HU155 Report Writing and Presentation skills

<div dir="rtl">

كتابة التقارير و مهارات العرض

</div>

This course introduces Basic rudiments of report writing. The rationale for report writing, the structure of reports, physical appearance and linguistic style. In addition to writing reports, students will also be given supplementary exercises, as necessary, to enhance their general writing skills. Recent correlated software packages should be used through labs.

HU200 Fundamentals of Economics and Feasibility Studies

<div dir="rtl">

أساسيات الإقتصاد ودراسات الجدوى

</div>

Concepts of economics. The economic problem. Supply and demand. Theory of demand including utility theory, theory of production, theory of cost, theory of firm including pricing theory, economics of education, economic of science and technology, economics of automation including computerization. Recent correlated software packages should be used through labs.

HU250 Human Rights and IT Ethics:

<div dir="rtl">

حقوق الإنسان وأخلاقيات المهنة

</div>

The course is intended to provide an increased understanding of how human rights and ethical issues present themselves in discussions of population policies and programs as well as how the science of demography is affected by human rights and ethical considerations. The course will begin with a brief review of demographic processes and methods, the human rights field, and basic modes of ethical thought. After this introduction, the course will give equal attention to four largely distinct areas:(1) the human rights consequences and the ethical foundations and implications of various substantive demographic policies and programs and, related to this, the impact of human rights, or their restriction, on demographic behaviors;(2) the human rights consequences of demographic research and methods and related issues of research ethics;(3) the impact of human rights, or their restriction, on demographic research; and(4) the use of demographic research and methods in support of human rights.

BS 110 Mathematics

<div dir="rtl">الرياضيات</div>

Limits and continuity, differentiation, trigonometric functions; applications of differentiation; integration; techniques of integration; application of integration. Indeterminate forms; Taylor's formula and improper integrals; Infinite series; Fourier series and Fourier integral; parametric curves and vectors in the plane; vectors, curves and surfaces in space; binomial theorem; partial fraction; partial differentiation. Matrices and operation; homogenizes and no homogenizes liner equation; determinants; vector spaces and sub spaces. Special functions; partial deferential equations; numerical analysis; complex variables; applications. Recent correlated software packages should be used through labs.

BS 125 Applied Statistics and Probability

<div dir="rtl">الإحصاء و الإحتمالات التطبيقية</div>

Introduction to probability, properties of probability, methods of computing probability, probability distribution, sampling and sampling distribution. Review of sampling theory and distributions, point's estimates, confidence interval estimates. Tests of hypotheses and significance for large or small samples, operating characteristic curves, quality control chart, fitting theoretical distributions to sample frequency distributions, goodness of fit. Curve fitting, regression and correlation. Analysis of variance Students are instructed on the use of a statistics computer package at the beginning of them. Parametric classifiers, bays linear classify, linear classifier Design, clustering, parametric clustering, nonparametric clustering selection at representatives. Recent correlated software packages should be used through labs.

BS 150 Discrete Mathematics

<div dir="rtl">الرياضيات غير المتصلة</div>

Functions, relations and sets, cardinality connectives, truth tables, normal forms, universal proof techniques: Implications, converse, inverse, direct proof, proof by counter example, contraposition, and contradiction mathematical Induction, graphs and trees: Undirected graphs, directed graphs, trees, spanning trees. Goops: Basic algebra in groups, cyclic groups. Recent correlated software packages should be used through labs.

BS 200 Numerical Computing

<div dir="rtl">الحسابات الرقمية</div>

Computational errors, floating-point computation. Root finding : bisection method, Newton's method, and secant method. Approximation theory: polynomial approximation, least squares method, interpolation, extrapolation, numerical differentiation and integration, initial value problems for ODE: method, Taylor-series methods, and Rung-Kutta methods. Numerical solutions of nonlinear systems of equations: Boundary-value problems for ODE. Numerical solutions to partial differential equations. Recent correlated software packages should be used through labs.

المحتويات العلمية لمقررات القسم العلمى

علوم الحاسب

CS 120 Introduction to Computers

مقدمة في الحاسب

This course serves as the introductory course to computers. It is designed to provide the students with an overview of the concepts, operating characteristics and capabilities of modern computer systems, using both lectures and laboratory exercises and demonstrations. Topics include Computer definition, different computer types, Computer organization, computer hardware, input/output units, storage media, computer memory types, arithmetic and logical unit (ALU), Basic operation of computer, computer software, communications/networking, World Wide Web; make use of the World Wide Web as an integrated learning tool. At this time, all labs work is done using MS Windows and Office. Students become familiar with the Internet, Microsoft Office, and WindowsXP. Get hands-on experience with these tools during lab class. Understand the fundamentals of program, data, instructions. Instructions fetch, decode, and execute. Data representation, Bits, bytes and words. Numeric data representation and numbering systems bases. Signed, one's, and two's complement representation. Numeric data representation, fixed and floating point systems. Representation of nonnumeric data (character codes, graphical data). Study of an operating system (windows, Linux). The functions of OS, input/output (I/O), files, folders, system, and disk operations. Problem Solving Techniques and flowcharts.Introduction to programming languages, structured programming using either C# (console) or C languages, general form of the program, expressions, arithmetic expressions, simple data types: real, integer, Boolean, character, sub range and enumerated data type, input and output statements, conditional control structures, compound statements, Boolean expressions. If statements, case statements. Repetition statements, arrays, functions and procedures. External module, records, pointers, and sets. Recent correlated software packages should be used through labs.

CS 150 Structured Programming

البرمجة الهيكلية

Basic programming in structured languages such as C++. Essential concepts, programming style, Data Types, Identifiers, Constants, Variables, Program Structure, Scoping, Binding. Input, Output, I/O Formatting, Text Processing, Arithmetic Operations, Assignment Operators, Boolean Operators, Logical Operators, Standard Functions. Conditionals -- Selection, Single-Branch Conditionals, Double-Branch Conditionals, Multiple-Branch (switch or case) Conditionals. Loops -- Iteration, Pretest Loops, Posttest Loops, Fixed Repetition Loops, Nested Loops, Immediate Loop Termination, Skipping Specific Loop Iterations. Functions -- Motivation for Using Functions, Function Parameters, Return Values, Function Prototypes, Functions with no Return Value, Parameterless Functions, Call by Value, Call by Reference, Default Parameter Values, Recursion, Function Overloading. Arrays -- Indexed Data Structures, One-Dimensional Arrays, Character Strings, Array and Loop Relationships, Array and Function Relationships, Array Searching Algorithms, Array Sorting Algorithms, Recursive Array Manipulation. Arrays-- two-dimensional arrays, two-dimensional arrays and nested loops, two-dimensional arrays and functions, processing rows of two-dimensional arrays as one-dimensional arrays, multi-dimensional arrays. Pointers -- physical memory addresses, defining and initializing pointers, de-referencing pointers, static pointers, dynamic pointers, pointer and array relationship, arrays of pointers, pointers as function parameters,

dynamic array sizing. structures -- data aggregates containing data of multiple types, using structure variables, structure arrays, pointers to structures, nested structures, structures as function parameters, structure member functions, overloading structure functions. Recent correlated software packages should be used through labs.

CS 200 Data Structures

<div dir="rtl">هياكل البيانات</div>

Specification, representation, and manipulation of basic data structures: linked lists, arrays, stacks, queues, trees, strings, symbol tables, Huffman codes, optimal search trees, pattern matching, priority queues, heaps, hash tables. Storage allocation, garbage collection, compaction, reference counts, Sorting, graphs (graph traversal, directed graphs). List and string processing languages. Analysis of algorithms. Performance evaluation involving worst case, average and expected case, and amortized analysis. Students are required to write programs in several languages such as C++, C#, Java, or Pascal. Recent correlated software packages should be used through labs.

CS 250 Object Oriented Programming

<div dir="rtl">البرمجة الشيئية</div>

The course focuses on development of skills such as program design and testing as well as the implementation of programs using a graphical IDE. Topics include theory of object-oriented design, classes, interfaces, inheritance hierarchy, correctness; abstract data types, encapsulation, formal specification with preconditions, post- conditions, and invariants, proofs of correctness; object-oriented software, classes and objects, classes as efficient programmer-defined data types, defining a class, data members, member functions, constructor functions, default constructor functions, destructor function, member function prototypes, member function default arguments, overloaded member functions,, inheritance, polymorphism, overloading; single and multiple inheritance, programming by contract, sub-classing as subcontract, specification and verification. Class scope, ``this'' pointer, object instantiation, access specifiers private and public, encapsulation, information hiding, private data members, public member functions, private member functions, array of class objects, containership, virtual functions, friend function and class, function and class templates, stream and files. The above concepts are implemented in either visual C++, C# (Windows application)or Java. Recent correlated software packages should be used through labs.

CS 255 Analysis and Design of Algorithms

<div dir="rtl">تحليل و تصميم الخوارزميات</div>

An introduction to the design and analysis of algorithms. The course covers design techniques, such as dynamic programming and greedy methods, as well as fundamentals of analyzing algorithms for correctness and time and space bounds. Topics include advanced sorting and searching methods, graph algorithms and geometric algorithms, notion of an algorithm: big-O, small-O, theta and omega notations. Space and time complexities of an algorithm. Fundamental design paradigms: divide and conquer, branch and bound, backtracking, dynamic programming greedy methods, simulation. Theory of NP-completeness, notion of an intractable problem. Measures of approximation: ratio bound and

relative error. Polynomial time approximation scheme. Illustrative examples: graph theory, computational geometry, optimization, numerical analysis and data processing. Other areas vary from year to year, and may include matrix manipulations, string and pattern matching, set algorithms, polynomial computations, and the fast Fourier transform. Recent correlated software packages should be used through labs.

CS260 Operating Systems

نظم التشغيل

This course will provide an introduction to operating system design and implementation. The course will start with a brief historical perspective of the evolution of operating systems over the last fifty years, and then cover the major components of most operating systems. This will include: Computer system structures, Operating system structures, Process and Process management: process synchronization and mutual exclusion; two- process solution and Dekker's algorithm, semaphores (producer- consumer, readers-writer, dining philosophers, etc), Interprocess communication, Process synchronization, Deadlocks, thread management, CPU scheduling: multiprogramming and time-sharing, scheduling approaches (SJF, FIFO, round robin, etc), Memory hierarchy and management: with and without swapping, virtual memory-paging and segmentation, page replacement algorithms, implementation., Virtual memory, Secondary storage management, I/O device management , File system: interface and implementation, FS services, disk space management, directory and data structure, Protection and security, and Case studies: Linux and Windows. Recent correlated software packages should be used through labs.

CS 300 Artificial Intelligence

الذكاء الإصطناعي

This is an introductory AI course. Topics will include Artificial and human intelligence, Overview of Artificial Intelligence, Basic Problem-Solving Strategies, Heuristic Search, Problem Reduction and AND/OR Graphs, domains of AI- symbolic processing: semantic nets, modeling model based reasoning, frames. Knowledge Representation, Representing Knowledge with If-Then Rules. Inference Engines, Inference techniques: implication, forward and backward chaining, inference nets, predicate logic, quantifiers, tautology, resolution, and unification. Rule based systems: inference engine, production systems, problem solving, planning, decomposition, and basic search techniques. AI languages: symbolic and coupled processing prolog: objects and relations, compound goals, backtracking, search mechanism, dynamic databases, lisp, program structure and operations, functions, unification, memory models. Fields of AI: heuristics and game plying, automated reasoning, problem solving, computational linguistics and natural language processing, computer vision, intelligent agents, robotics AI based computer systems: sequential and parallel inference machines, relation between AI and artificial neural nets, fuzzy systems. Recent correlated software packages should be used through labs.

CS 350 Formal Languages and Automata

<div dir="rtl">اللغات الصورية ونظرية الآليات</div>

Alphabets and languages. Finite representation of language. Deterministic and non-deterministic finite automata and their applications. Equivalence considerations. Regular expressions. Context-free languages. Context-free grammars. Regular languages, pushdown automata. Properties of context-free languages. Determinism and parsing top-down parsing, and bottom-up parsing. Turing machines: Computing with Turing machines, combining Turing machines, and nondeterministic Turing machines. Recent correlated software packages should be used through labs.

CS 400 Advanced Operating systems

<div dir="rtl">نظم تشغيل متقدمة</div>

Students will study advanced operating system topics and be exposed to recent developments in operating systems research. This course involves readings and lectures on classic and new papers. Topics: virtual memory management, synchronization and communication, operating system structure and extension techniques, fault tolerance, and history and experience of systems programming, concurrent programming, distributed interprocess communication, distributed process scheduling, concurrency, transactions, parallel computing, shared memory, message passing, and scale shared, distributed file systems, security in distributed systems, Distributed Mutual Exclusion, Drinking Philosophers Problem, Deadlocks in Distributed Systems, multiprocessors, multimedia operating systems, real- time operating systems and mobile computing. Recent correlated software packages should be used through labs.

CS405 Compiler Design

<div dir="rtl">تصميم المترجمات</div>

Structure of compiler, lexical analysis, lexical patterns, deterministic & Nondeterministic finite automata, scanner, construction, limits of regular languages, parsing, derivations, parse trees, operator precedence, ambiguous grammars, table construction, hierarchy of context-free languages, context sensitive analysis, procedure abstraction, introduction to code generation, code shape and arithmetic expressions, code optimization and static analysis, data- flow analysis, data-dependence analysis, transformations, taxonomy, scalar transformations, post-pass optimizations, instruction selection instruction scheduling, register allocation. Recent correlated software packages should be used through labs.

CS415 Computational Intelligence

<div dir="rtl">الذكاء الحسابي</div>

Introducing concepts, models, algorithms, and tools for development of intelligent systems. Example topics include artificial neural networks, genetic algorithms, fuzzy systems, swarm intelligence, and hybridizations of the above techniques. This course contains Basic Concepts, Single-Layer Perceptrons as Classifiers, Multi-Layer Feedforward Networks, Single-Layer Feedback Networks, Associative Memories, Self-Organizing Networks, Genetic Algorithms, Swarm Intelligence, Fuzzy Logic, Fuzzy Neural Networks, Radial Basis Function Neural

Networks, The Power and Computational Complexity of Neural Networks, Computational Intelligence and Knowledge, A Representation and Reasoning System, Using Definite Knowledge, Searching, Representing Knowledge, Knowledge Engineering, Beyond Definite Knowledge, Actions and Planning, Assumption-Based Reasoning, Using Uncertain Knowledge, Learning, Building Situated Robots, The Prolog Programming Language, Some More Implemented Systems. Recent correlated software packages should be used through labs.

CS 420 Selected Topics in Computer Science

موضوعات مختارة في علوم الحاسب

Selected Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of computer science. Specific topics covered are dependent on the instructor. Potential topics include: scientific visualization, computational geometry, photo-realistic image rendering and computer animation. Recent correlated software packages should be used through labs.

CS 455 Parallel Processing

المعالجة على التوازى

This course is an introduction to parallel and distributed processing, including both the theory and the application of parallel-processing concepts. Course content will include discussions of different types of parallel machines and machine models, the design and analysis of parallel algorithms, the development of parallel programs, Parallel algorithm and concurrent programming (distributed algorithms) design and analysis of concurrent algorithms, emphasizing those suitable for use in distributed networks, Process synchronization, allocation of computational resources, distributed consensus, distributed graph algorithms, election of a leader in network, distributed termination, deadlock detection, concurrency control, communication, and clock synchronization. Special consideration given to issues of efficiency and fault tolerance, and Formal models and proof methods for distributed computation. Recent correlated software packages should be used through labs.

CS 460 Theory of Computation

نظرية الحسابات

An introduction to the theoretical foundations of computing, including abstract models of computing machines, the grammars those machines recognize, and the corresponding classes of languages. Topics include: Church's thesis; Grammars, the M-recursive functions, and Turing computability of the M-recursive functions, The incompatibility: The halting problem, Turing innumerability, Turing acceptability, and Turing decidability, unsolvable problems about Turing machines and M-recursive functions, Computational complexity: Time-bounded Turing machines, Rate of growth of functions, NP- Completeness, The complexity hierarchy, The prepositional calculus: Syntax, Truth-assignment, Validity and satisfy, and Equivalence and normal forms compactness. Recent correlated software packages should be used through labs.

CS465 Human-Computer Interaction Design

التفاعل بين الإنسان و الكمبيوتر

Introduction to Human-Computer Interaction, or how computers communicate with people. Methodology for designing and testing user interfaces, interaction styles (command line, menus, graphical user interfaces, virtual reality), interaction techniques (including use of voice, gesture, and eye movement), design guidelines, and user interface management system software. Comprehensive coverage of computer human interaction(CHI) importance, design, theories, and future direction; modeling compute interfaces, empirical techniques for task analysis and interface design of interaction, The scope of HCI: Different theories and disciplines that contribute to HCI, HCI Analysis: User analysis, task analysis, environment and domain analysis, Human Cognitive Architecture: Perception, memory, problem solving, Dialogue design: Input, output devices and ergonomics; embedded systems; web usability; interfaces for mobile devices; future systems, CSCW, Influences on Design: Guidelines and standards in HCI; conceptual design, Prototyping in HCI: vertical, horizontal, full, throw-away prototypes, and Empirical evaluation: qualitative and quantitative methods of collecting data from users; the Usability Engineering approach; research topics in evaluation techniques. Students will design a small user interface, program a prototype, and then test the result for usability. Recent correlated software packages should be used through labs.

CS 470 Computer Systems Security

نظم أمان الكمبيوتر

This course provides a comprehensive introduction to the field of computer security. Security architectures and their impact on computers are examined. Critical computer security aspects are identified and examined from the standpoints of both the user and the attacker: physical security, communications security, system security and operational security. Computer system vulnerabilities are examined, and mitigating approaches are identified and evaluated. Concepts and procedures for computer and computer network risk analysis are introduced. An overview of computer security statutes and case law is presented. The course emphasizes a timely approach, maintained by using recent examples of computer attacks and the resources available to deal with the rapidly changing framework of computer security. Recent correlated software packages should be used through labs.

CS 475 Selected Topics in Computer Science

موضوعات مختارة في علوم الحاسب

Selected special topics in computer science not covered in other courses. Selected Topics provides an opportunity to study a topic which is not included in the existing curriculum. Recent correlated software packages should be used through labs.

CS 450 Project

المشروع

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted.

CS 600 Advanced Analysis of Algorithms

التحليل اللوغارتمي المتقدم:

An advanced study of algorithms and data structures. Analysis of algorithms, space and time complexity, and the NP classes will be considered. Significant illustrative individual or group programming projects are required. Examples may be drawn from heuristic programming, encipherment, natural language processing, object code generation, combinatorial analysis, graphics, robotics, relational databases, or other algorithmic issues of current importance. Recent correlated software packages should be used through labs.

CS 601 Advanced Artificial Intelligence

الذكاء الاصطناعي المتقدم :

These topics will extend existing knowledge about search, machine learning, reasoning, and situated action. Some topics are required; others may be negotiated with the class. Topics may include planning, probabilistic reasoning, reinforcement learning, evolutionary computation, advanced neural networks, natural language processing, constraint satisfaction, reactive systems, knowledge-based learning, robotics, vision, emergent behavior, and intelligent multiagent systems. Recent correlated software packages should be used through labs.

CS 602 Advanced Cryptography and Computer Security

التشفير المتقدم وحماية الحاسب الالي:

The class will focus on the study of *secure multiparty computation*. Informally, these are general protocols among two or more parties, where all parties want to maintain the privacy of their inputs and prevent other parties from disrupting the correct execution of the computation (for example, think of voting protocols, auctions, computing the average salary of the participants, playing black jack, etc.). Indeed, secure computation can be viewed as encompassing, in some sense, every other cryptographic task as a special case, and general plausibility results (protocols for secure computation of any functionality) are among the most important results in cryptography. Recent correlated software packages should be used through labs.

CS 604 Advanced Operating Systems

نظم التشغيل المتقدمة:

The core of the course contains concurrent programming (threads and synchronization), inter-address communication, and an introduction to distributed operating systems. Other topics may be added, especially in conjunction with related programming projects. Such topics include memory management (especially virtual memory subsystems), dynamic libraries, "avantgarde" kernel architectures (microkernels, exokernels), and file systems (e.g., log-structured file systems). Recent correlated software packages should be used through labs.

CS 606 Advanced Topics in Computer Science (I)

موضوعات متقدمة في علوم الحاسب 1

Topics which are not included in the curriculum and seems to be needed should be suggested as an elective course by Computer Science department. Recent correlated software packages should be used through labs.

CS 607 Advanced Topics in Computer Science (II)

موضوعات متقدمة في علوم الحاسب2

Topics which are not included in the curriculum and seems to be needed should be suggested as an elective course by Computer Science department. Recent correlated software packages should be used through labs.

CS 608 Advanced Compiler Design

تصميم المعالجات المتقدمة :

Study of the techniques for translating conventional programming language source into executable machine codes. Topics include: lexical analysis, syntactic analysis and parsing, static and runtime storage management, and code generation.. Recent correlated software packages should be used through labs.

CS 609 Complexity Theory

نظرية التعقيد :

This course considers computational models and mathematical formalism for reasoning about the resources needed to carry out computations and the efficiency of the computations that use these resources. We will begin by briefly brushing up on some background in elementary set theory and discrete math. Then we will introduce computation and study the Turing machine model and study both complexity and computability using this model. Recent correlated software packages should be used through labs.

CS 610 Computer Arabization

تعريب الحاسب الآلي :

Introduction. Arabic Language Characteristics. Arabic Character Sets. Standardization. Arabic Characters for screen and printers. Arabization systems. Arabic software tools, and programming languages. Introduction to Arabic Computations. Projects in specific discipline using available tools. Recent correlated software packages should be used through labs.

CS 611 Computer Human Interaction Design

<div dir="rtl">تصميم التفاعل الإنساني مع الحاسب الالي:</div>

This course will introduce you to the structure of communication between human and computers. User's models, interface styles, the effect of user's capabilities and limitations on the interaction as well as the strength and limitations of interaction devices. Provide opportunity to evaluate a system by applying experimental methodology and to appreciate the HCI role in Software Engineering. Recent correlated software packages should be used through labs.

CS 612 Computer Systems Performance

<div dir="rtl">أداء نظام الحاسب الالي :</div>

It introduces the main concepts and techniques needed to plan the capacity of computer systems, predict their future performance under different configurations, and design new applications that meet performance requirements. The course is mainly based on the use of analytic queuing network models of computer systems. These techniques are applied to study the performance of centralized, distributed, parallel, client/server systems, Web server and e-commerce site performance. The course also discusses performance measuring tools for operating systems such as Unix and Windows NT. Recent correlated software packages should be used through labs.

CS 613 Evolutionary Algorithms

<div dir="rtl">طرق الحساب التطوري :</div>

Evolutionary computation (EC), neuro-computation (NC) and fuzzy logic (FL), are considered as three major components of the so called soft computing. The main idea of soft computation is to make decisions based on rough (incomplete, noisy, uncertain) data. The computing technology which make decisions based on clean, clear and complete data is often called hard computing, although researchers in this field are not hard at all (actually, they are the most intelligent and flexible people in the world). Actually, the human brain is a computing machine consisting of two parts. The left part is good at hard computing (logical thinking), and the right part is good at soft computing (heuristic thinking). During the last half century, we developed a lot of computers for assisting the left part of the brain. In this century, we will put more energy to make computers to assist the right part of the brain. Recent correlated software packages should be used through labs.

CS 614 Fuzzy Logic and Intelligent Systems

<div dir="rtl">المنطق المشوش والأنظمة الذكية :</div>

Fuzzy Set and Fuzzy Logic: motivation, possibilistic interpretation, basic concepts, set operations, fuzzy relations, and fuzzy inferences. Fuzzy Logic Applications: approximate reasoning, fuzzy arithmetic, linguistic models, decision theory, classification, and fuzzy controllers (development, tuning, compilation, deployment). Computational Intelligence (CI): hybrid systems based on fuzzy, neural and evolutionary computation. Case studies of real-

world industrial and financial applications . Recent correlated software packages should be used through labs.

CS 615 Machine Learning

<div dir="rtl">

تعليم الالة :

</div>

Machine Learning is concerned with computer programs that automatically improve their performance through experience. Machine Learning methods have been applied to problems such as learning to drive an autonomous vehicle, learning to recognize human speech, and learning strategies for game playing. This course covers the primary approaches to machine learning from a variety of fields, including inductive inference of decision trees, neural network learning, statistical learning methods, genetic algorithms, bayesian methods, explanation-based learning, and reinforcement learning. Recent correlated software packages should be used through labs.

CS 616 Neural Networks

<div dir="rtl">

الشبكات العصبية

</div>

This course focuses on the foundations of neural network theory and the application of neural network models in engineering, cognitive science, and artificial intelligence. The course will present the major neural network paradigms: attractor neural network models of memory, a sequence of supervised learning models of increasing complexity, a sequence of unsupervised clustering and categorisation networks, reinforcement learning networks . Recent correlated software packages should be used through labs.

CS 617 Parallel Algorithm Design and Analysis

<div dir="rtl">

تصميم وتحليل الحساب الموازي :

</div>

This course is about the design and analysis of algorithms. We study specific algorithms for a variety of problems, as well as general design and analysis techniques. Specific topics include searching, sorting, algorithms for graph problems, efficient data structures, lower bounds and NP-completeness. Recent correlated software packages should be used through labs.

CS 618 Programming Language Design

<div dir="rtl">

تصميم لغات البرمجة :

</div>

This course is an introduction to the principles which underlie the definition and implementation of programming languages. Study of modern programming language paradigms (procedural, functional, logic, object oriented). Introduction to the design and implementation of programming languages including syntax, semantics, data types and structures, control structures, and run-time environments. Recent correlated software packages should be used through labs.

المحتويات العلمية لمقررات القسم العلمى

نظم المعلومات

IS 150 Computer Skills for Personal Productivity

مهارات الكمبيوتر

This course covers basic computer tools for personal productivity beyond an introductory level. Topics include computer files, word processing, spreadsheets, databases, presentation software, and accessing electronic information. The objective is to prepare a student for the International Computer Driving License (ICDL) Examination. Recent correlated software packages should be used through labs.

IS 200 Fundamentals of Information Systems

أساسيات نظم المعلومات

Fundamental concepts, objective of information system, system definition, subsystem definition, message passing in information system, message levels data, information, knowledge, needs, characteristics, sources, data processing (DP), electronic data processing (EDP), management information system (MIS), economics of information systems, decision support system (DSS), office automation system (OAS), executive information system (IS), expert system (ES), computer based information system (CBIS), type of CBIS, relationships among CBISs, the evolutionary view, the hierarchical view, the contingency view, the importance of CBIS, the nature of information system in different organization. Management concepts in CBIS, data management, the organization of data, application oriented files, database approach, decision-making concepts and tools, decision support system (DSS), building a DSS, application of DSS, evaluation of information systems. Recent correlated software packages should be used through labs.

IS 250 Database Concepts

مفاهيم قواعد البيانات

File organization and record storage; heap, sorted, and index files including B-trees and disk based hashing algorithms; entity relationship model, relational model, relational languages; database normalization; implementation of heap files and indexing techniques. Other topics include database modelling, operations in the relational model, database language SQL, constraints in SQL, system aspects of SQL. Lab works using Oracle. Recent correlated software packages should be used through labs.

IS 300 Database Management Systems

نظم إدارة قواعد البيانات

An introduction to the theory and design of database management systems. Topics covered include internals of database management systems, fundamental concepts in database theory, and database application design and development.

In particular, logical design and conceptual modeling, physical database design strategies, relational data model and query languages, query optimization, transaction management and distributed databases. Lab works using ORACLE. Recent correlated software packages should be used through labs.

IS 305 Systems Analysis and Design (I)

تحليل وتصميم النظم (1)

Fundamental concepts, system definition, information systems building blocks, information systems development, systems analysis, requirement discovery, data modelling and analysis, process modelling, object-oriented analysis and modelling, feasibility analysis and system proposal. Lab works using CASE tool. Recent correlated software packages should be used through labs.

IS 350 Systems Analysis and Design (II)

تحليل وتصميم النظم (2)

System design, application architecture and modelling, database design, output design and prototyping, input design and prototyping, user interface design, object-oriented design and modelling, system construction and implementation, system operation and support. Lab works using CASE tool. Recent correlated software packages should be used through labs.

IS 355 Expert Systems and Decision Support Systems

النظم الخبيرة ونظم دعم القرار

This course is a comprehensive treatment of decision support systems (DSS) and Expert Systems (ES) as managerial support tools. This course will examine the design, development and implementation of information technology based systems that support managerial and professional work, including Communications-Driven and Group Decision Support Systems (GDSS), Data-Driven DSS, Model-Driven DSS, Document-Driven DSS, and expert systems (knowledge-based systems. It will also cover the following topics in ES: overview of AI and ES, knowledge engineering, knowledge acquisition techniques, knowledge representation techniques, reasoning techniques, and building expert systems. Also the students will learn how to use expert system shells such as EXSYS in building some ES applications. Recent correlated software packages should be used through labs.

IS 400 e-Business System Strategy

إستراتيجية نظم الأعمال الإلكترونية

This course focuses on business process redesign and change the management in the context of e-business. Topics include impact of e-business on business models, channel relationships and the value chain, integration of emerging technologies with legacy systems, functional and inter-organizational integration, and transaction cost issues. Applications include supply and selling chain management, customer relation management, enterprise resource planning, e-

procurement, and knowledge tone applications. Recent correlated software packages should be used through labs.

IS 405 Distributed and Mobile Database

<div dir="rtl">

نظم قواعد البيانات الموزعة و المحمولة

</div>

Levels of distribution transparency. Distributed database design, mapping user's transactions to distributed level. Optimization of accesses strategies. The management of distributed transactions. Distributed concurrence control, recovery in distributed database. Distributed database administration. Also, this course addresses the use of Internet databases to support Web solutions. Topics covered include techniques for the exchange and sorting of information, and the best way to achieve this through an Internet database. The emphasis is on the design of Internet databases that could allow the deployment of an entire product catalog online; dynamically-generated Web pages that allow visitors to share common interests on topics related to a Web site; a catalog linked to sites that may be useful to visitors; and, building a company Intranet that tracks the progress and status of current projects. Recent correlated software packages should be used through labs.

IS 410 Information Security

<div dir="rtl">

أمان البيانات

</div>

Introduction, identification and authentication, authorization rules. Data classification. Basic data encryption and decryption, different encryption and decryption techniques, different types of ciphers, characteristics of good ciphers, crypt analysis, public-key system, single-key system and data encryption standards, threats, safeguards and security objectives, security with some existing systems, security level. Computer virus protection, privacy and data protection, designing of secure system, models of security, database, security, reliability and integrity, sensitive data. Multi-level data, security, protection of files, copy protection, personal computer, security computer network and security. Recent correlated software packages should be used through labs.

IS 415 Information Services Management

<div dir="rtl">

إدارة خدمات المعلومات

</div>

Design and management of the services functions performed by the Information Systems organization. Topics include: Managing help desks, customer support, training end users, developing professional development programs for IS employees, documentation management, and marketing IT products. Internal and external clients are considered. Recent correlated software packages should be used through labs.

IS 420 Selected Topics in IS

<div dir="rtl">

موضوعات مختارة في نظم المعلومات

</div>

Topics which are not included in the curriculum and seems to be needed should be suggested as an elective course by IS department. Recent correlated software packages should be used through labs.

IS450 Project

المشروع

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted

IS 455 Data Mining and Knowledge Discovery

إستخلاص البيانات وإكتشاف المعرفة

The objective of this course is to understand the fundamentals of data warehousing, data mining, and decision support systems. Topics include basic data warehouse architecture, data consolidation, warehouse internals (storage and indexing materialized views and aggregate pre-computation), Online Analytical Processing (OLAP) systems, main operations of data mining, system integration issues in decision support tools, survey of existing mining and OLPA products, and success and failure stories of data mining. Recent correlated software packages should be used through labs.

IS 460 Multimedia Information Systems & Digital Libraries
نظم معلومات الوسائط المتعددة و المكتبات الرقمية

Concepts and methods of design, management, creation, and evaluation of multimedia information systems. Theory and practice of digital media production, reception, organization, retrieval, and reuse. Review of applicable digital technology with special emphasis on digital video. Course will involve group projects in the design and development of digital media applications. Recent correlated software packages should be used through labs.

IS 465 e-Business Technologies
تكنولوجيا الأعمال الإلكترونية

This course focuses on core e-business technologies. Topics include risk management , internet protocols and security standards, cryptography and authentication, firewalls, electronic payment systems and intelligent agents. Students will conduct an analysis of infrastructure components from functional and management perspectives. Recent correlated software packages should be used through labs.

IS 470 Object Oriented Databases
قواعد البيانات الموجهه

History of data models. Semantic data models. Problems in record-oriented models. Object data model. Classes and inheritance. Methods and messages. Multiple inheritance. Object queries. Object queries languages OQL. Indexing in object databases. Processing object queries. Object transaction. Concurrency control in object databases. Security in object databases. Using the object model in advanced applications. Recent correlated software packages should be used through labs.

IS 475 Selected Topics in IS

موضوعات مختارة في نظم المعلومات

Topics which are not included in the curriculum and seems to be needed should be suggested as an elective course by IS department. Recent correlated software packages should be used through labs.

GDIS 510 Systems Analysis and Design

تحليل وتصميم النظم

Fundamental concepts, system definition, information systems building blocks, information systems development, systems analysis, requirement discovery, data modelling and analysis, process modelling, object-oriented analysis and modelling, feasibility analysis and system proposal, System design, application architecture and modelling, database design, output design and prototyping, input design and prototyping, user interface design, object-oriented design and modelling, system construction and implementation, system operation and support. Lab works using CASE tool. Recent correlated software packages should be used through labs.

GDIS 555 E-Commerce

التجارة الإلكترونية

This course provides the learner with an overview of the state of e-commerce today. It defines electronic commerce and discusses electronic commerce elements. An overview of business-to-consumer and business-to-business electronic commerce is given. This course also addresses issues and technologies available for companies wishing to engage in e-commerce, this course introduces Introduction to E-commerce, E-Commerce Standards, E-commerce in Enterprise, E-commerce Technology Building Blocks. Recent correlated software packages should be used through labs.

IS 500 Management of Information Systems

إدارة نظم المعلومات

Design and management of the services functions performed by the Information Systems organization. Topics include: Managing help desks, customer support, training end users, developing professional development programs for IS employees, documentation management, and marketing IT products. Internal and external clients are considered. Recent correlated software packages should be used through labs.

IS 501 Information Systems Analysis and Design

تحليل وتصميم النظم

The analysis and design phases of system development life cycle are covered in detail. Methodologies for systems analysis, specifications, and design are covered. Both the traditional structured and object oriented methodologies systems. Emphasis is placed on well-written documentation as well as oral communication typically required during the software development life cycle. Project management tools are employed by students to monitor their progress and the costs associated with their projects. CASE tools are employed for data and information modeling and specification. Recent correlated software packages should be used through labs.

IS 502 Business Data Communications

<div dir="rtl">

تراسل بيانات الأعمال

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The basic objective of this course is to provide students with a broad understanding the knowledge and fundamentals of telecommunications within a business environment. The topics include protocols, communication software, switching, networks design and management practices, and network implementation projects. Recent correlated software packages should be used through labs.

IS 503 Database Design

<div dir="rtl">

تصميم قواعد بيانات

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This course builds on Database Design and SQL Programming. It includes additional data modeling techniques and upper Normal Forms (Boyce/Coded, Fourth, and Fifth). It delves into the concepts of database integrity and transaction management, concurrency protocols (locking and time stamping), and security schemes. The course also covers database optimizers, performance and tuning and advanced SQL topics. Recent correlated software packages should be used through labs.

IS550 Project

<div dir="rtl">

المشروع

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This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted

IS 551 Database Management and Administration

<div dir="rtl">

إدارة قواعد البيانات

</div>

Managing information resources. Data planning, global information architectures; advanced data manipulation languages, comprehensive DBMS facilities, and O-O DBMS; analysis and data mining tools; deploying and managing databases in a distributed environment. Data integrity, security, and privacy. Recent correlated software packages should be used through labs.

IS 552 Expert Systems and Decision Support Systems

<div dir="rtl">

النظم الخبيرة ونظم دعم القرارات

</div>

This course is a comprehensive treatment of decision support systems (DSS) and Expert Systems (ES) as managerial support tools. This course will examine the design, development and implementation of information technology based systems that support managerial and professional work, including Communications-Driven and Group Decision Support Systems (GDSS), Data-Driven DSS, Model-Driven DSS, Document-Driven DSS, and expert systems (knowledge-based systems. It will also cover the following topics in ES: overview of AI and ES, knowledge engineering, knowledge acquisition techniques, knowledge representation techniques, reasoning techniques, and building expert systems. Also the students will learn

how to use expert system shells such as EXSYS in building some ES applications. Recent correlated software packages should be used through labs.

IS 553 Information Security

أمان المعلومات

Introduction, identification and authentication, authorization rules. Data classification. Basic data encryption and decryption, different encryption and decryption techniques, different types of ciphers, characteristics of good ciphers, crypt analysis, public-key system, single-key system and data encryption standards, threats, safeguards and security objectives, security with some existing systems, security level. Computer virus protection, privacy and data protection, designing of secure system, models of security, database, security, reliability and integrity, sensitive data. Multi-level data, security, protection of files, copy protection, personal computer, security computer network and security. Recent correlated software packages should be used through labs.

IS 554 Selected Topics in IS

موضوعات مختارة فى نظم المعلومات

This course aims at introducing students to novel topics in information systems that need to be identified in a responsive manner as technology and its use evolve and develop. This course is essentially a flexibility enhancing will be filled on a year-by-year basis. Recent correlated software packages should be used through labs.

EC 500 An E-Commerce Introduction

مقدمة في التجارة الإلكترونية

This course should examine the changing role of information technology and management information systems in organizations. Role of IT and MIS as competitive tools. Examine the current and potential impact of information and information technology on all aspects of his or her position, firm, and industry systematically. Since this a graduate level course, this course will focus on it from the perspective of managers. For example, case studies describing the role of IT and MIS as competitive tools should be covered extensively. Since e-business is the next major revolution-students will be expected to understand the technology of ecommerce and the impact of ecommerce on MIS. Topics include IT systems, strategic and competitive opportunities ,databases and data warehouse, decision support systems, networks, emerging technologies , planning for IT systems ,developing IT systems, managing IT systems. With regards to e-commerce and e-business: Business to consumers e-commerce , business to business e-commerce , The role of government in promoting e-commerce ,e-commerce payment systems and digital cash , security and privacy Issues; e-business vs. e-commerce. Recent correlated software packages should be used through labs.

EC501 Web Technology: Servers and Software

تكنولوجيا الإنترنت

Introduction client/server architecture and multi-tiered architecture as it pertains to web technology. It provides fundamentals of hardware ands software as well as middleware. The course also provides some introduction to the following topics: Telecommunication, Web Server Administration, web Server planning, HTTP, and security. Web Server Administration: understanding of what is required to configure a web server and keep it running. Planning of a web server - from sizing and performance issues to choosing server software an ISP. How the HTTP protocol works, how ASP/JSP/CGI programs execute various methods for publishing documents on a web server. Detects and fix problems and how to generate server statistics issues by analyzing server log files. Web security introduction -covers the security issues surrounding the web. Types of threats and protecting the machines and users against these threats, web client security. Recent correlated software packages should be used through labs.

EC 502 Web Programming

برمجة الإنترنت

This course presents a complete immersion into web programming. HTML language is covered in this course if students have not picked it up else where. Other topics include Dynamic HTML: Scripting using JavaScript and XML; server side components such as CGI, ASP and PERL are also introduced in this course .the course focuses on building competencies in the client/server development for web sites used in the internet/intranet environments. Java is also introduced here. Recent correlated software packages should be used through labs.

EC 503 Object Structures Analysis and Logical Design

تحليل وتصميم منطقى لهياكل الكائنات

This course focuses on the systems development life cycle for creating web applications; the focus is on object-oriented systems analysis and design. It introduces different paradigms or developing web software, the key stages of the life cycle and identifies key deliverables for each stage .Object technology is introduced in this course and importance o object-oriented paradigm underscored. The students should be able o identify best architectural methods for any project; understand concepts such as abstraction refractory and architectural prototyping. Topics include information systems development, object oriented analysis .object-oriented design players in the systems Game, UML,use cases , class models , project management , systems analysis , requirements discovery , data and process modeling feasibility analysis, systems design application architecture ,output design and prototyping , input design and prototyping user interface design. Recent correlated software packages should be used through labs.

EC 550 Project

المشروع

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted.

EC551 Telecommunication and Web Security

نظم الإتصالات وأمان الشبكات

This course provides networking knowledge needed to succeed in the Web environment. Topics can range from networking topology to networking media, network standards to Ethernet, optimization to streaming media, web protocols to DSL access. Advanced web security concepts need to be covered in this course as well such   as intrusion detection and recovery, viruses, firewalls, encryption, PGP. From the e-business perspective topics covered include Electronic Payment mechanisms (and security of transaction), client-side security ,web document security, server side security, securing electronic commerce environments, analysis of the major classes of Electronic Commerce security, and survey of new trends. Topics include network characteristics, network models, WANs, internet works, intranets, and extranets; Architecture: packet-switched networks, client/server architectures, Ethernet, network components, and more; Protocols: IP, TCP, UDP, DNS,HTTP, SMTP, MIME, FTP, MAC address, and more; Applications: mail, web services, FTP, push and pull technologies, and streaming multimedia ; connectivity: DSL, T-1/T-3, ISDN, wireless networks, and cable modem connectivity; security: Encryption, SSL, SHTTP, HTTP, SET, firewalls, snifters, proxy servers, and VPNs; Web Server Support : Web development , scripting, JavaScript, CGI,server-side APIs, and dynamic content; intrusion detection and recovery; detecting an attack and recovering from an attack; secure online transactions : Encryption; secure socket layer; certificate authororities; Access Control lists. Client side security topics: Active content attacks, browser bugs web master attacks, cookies, and SSL weakness. Recent correlated software packages should be used through labs.

EC 552 DBMS: Physical Design and Implementation

التصميم والتطبيق الفعلى لنظم إدارة قواعد البيانات

The focus of such a course is two fold-first to introduce database concepts and to focus on data and information modeling (including systems design) and implementation within a DBMS environment. Students also learn to use a popular DBMS system such as Oracle. Topics include Database Environment, DBMS, data models, relations model, object model (OODBMS), principles of database (relation algebra), SQL, normalization. Relational database design, implementation and support. Each student/team can be asked to design and implement a small relational data base system using Oracle. Students should be able to connect web applications to a DBMS and store and update data remotely via a web interface. Recent correlated software packages should be used through labs.

EC 553 Project Management for Web Projects

إدارة مشروعات الشبكة

Focus is on developing and implementing a business plans that works in the online community. Basic project management concepts such as project planning, organizing and control are also introduced in this project. The students learn various functional areas such: Project scope management, human resource management and communications. Topics include the topics listed above are introduced. (The Project Management Institute curriculum could be adopted.) This Project management course could be blended with a Web Marketing flavour. Students could be assigned to envision a marketing strategy and find the technology to support it, reach the clients that are right for the business, develop your plans into reality, manage the project, the team, and the client ; get to the product launch-and through the special legal issues surrounding Internet communications. Recent correlated software packages should be used through labs.

EC554 Selected Topics in E-Commerce

موضوعات مختارة في التجارة الإلكترونية

Topics which are not included in the curriculum and seems to be needed should be suggested as an elective course by IS department. Recent correlated software packages should be used through labs.

EC 550 Project

المشروع

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted.

IS 600 Advanced Database Design

تصميم قواعد البيانات المتقدمة

Comparative review of data modeling methodologies. Advanced constructs in database design. Modeling subtypes and super types, ternary and higher-order relationships, integrity constraints. CASE tools; representation of facts; verbalization of a data model for human understanding and validation. Recent correlated software packages should be used through labs.

IS 601 Advanced Database Management and Administration

إدارة قواعد البيانات المتقدمة

Managing information resources. Data planning, global information architectures; advanced data manipulation languages, comprehensive DBMS facilities, and O-O DBMS; analysis and data mining tools; deploying and managing databases in a distributed environment. Data integrity, security, and privacy. Recent correlated software packages should be used through labs.

IS 602 Database Application Design and Implementation

تنفيذ وتصميم تطبيقات قواعد البيانات المتقدمة

This course examines contemporary strategies for the design and implementation of applications supported by back-end database systems. Topics include data administration, data mining, user-interface design, reporting, data integrity issues, and distributed databases. Relational and object-oriented technologies are covered. Recent correlated software packages should be used through labs.

IS 603 Advanced Information systems analysis and design

تحليل و تصميم نظم المعلومات المتقدم

The analysis and design phases of system development life cycle are covered in detail. Methodologies for systems analysis, specifications, and design are covered. Both the traditional structured and object oriented methodologies systems. Emphasis is placed on well-written documentation as well as oral communication typically required during the software development life cycle. Project management tools are employed by students to monitor their progress and the costs associated with their projects. CASE tools are employed for data and information modeling and specification. Recent correlated software packages should be used through labs.

IS 604 Object-Oriented Information Systems Design and Implementation

<div dir="rtl">

تصميم وتنفيذ نظم المعلومات الموجهة

</div>

An introduction to the development of business information systems in distributed environments with special emphasis on client – server, network –based architectures. Focuses in managing the technical and human aspects of the systems development process in organizations and gives the theoretical, yet practical, look at real systems issues. in addition to showing how client – server architectures can be used to gain strategic advantage , the course covers such topics as user interface considerations , implementation , debugging , testing , and maintenance of systems in distributed environments . A variety of windows-based software tools are used to provide hands on experience in designing reduced versions of real business information systems. Recent correlated software packages should be used through labs.

IS 605 Distributed Database Management System

<div dir="rtl">

إدارة قواعد البيانات الموزعة

</div>

Knowledge and awareness of current trends and emerging technologies and distributed data management is quintessential to 21st century database management. This course builds on the fundamental of database that manages distributed data. the development of distributed data Information Systems abase management is introduced by focusing on concepts and technical issues .a survey of varies topics in distributed database management systems (DBMS) includes architecture , distributed database design , query processing and optimization , distributed transaction management and concurrency control , distributed and heterogeneous object management systems , and database interoperability . Recent correlated software packages should be used through labs.

IS 606 Advanced Topics in Database Systems

<div dir="rtl">

موضوعات متقدمة فى قواعد البيانات

</div>

This course will cover cutting – edge research and development topics in database systems technology. Application of middleware to the integration of distributed and heterogeneous database systems, and the development and use of object – relational database systems. This course assignment will consist of an analysis of a cutting edge software product or a paper on an advanced research topic. Recent correlated software packages should be used through labs.

IS 607 Information Retrieval

<div dir="rtl">

إسترجـــاع المعلومات

</div>

Overview of fundamental issues of information retrieval with theoretical foundation. Comprehensive survey of information – retrieval techniques and theory, covering both effectiveness and run – time performance of information – retrieval systems. The focus is on algorithms and heuristics used to find documents relevant to the user request and to find them fast. Recent correlated software packages should be used through labs.

IS 608 Data Mining and Knowledge Systems

<div dir="rtl">

إستخلاص البيانات ونظم المعرفة

</div>

Data mining is the process of converting the raw data into useful information or knowledge required to support decision making .it automates the process of knowledge discovery ,making us orders of magnitude more productive in our search for useful information that we would be otherwise .it also increases the confidence with which we can make business decisions.

The course focuses on two subjects simutaneously:1) the essential data mining and knowledge representation techniques used to extract intelligence from data and experts, and 2) common problems from the fields of Finance ,Marketing, and Operations/Service that demonstrate the use of the various techniques and the tradeoffs involved in choosing from among them.

The area explicitly covered in the course is: OLAP, neural networks, genetic algorithms, rule induction, fuzzy logic, case-based reasoning, and rule-based systems. Recent correlated software packages should be used through labs.

IS 609 Intelligent Information Systems

<div dir="rtl">

نظم المعلومات الذكية

</div>

Main focus is knowledge discovery in database , knowledge – base maintenance , knowledge – base and database integration architectural , and scale – up and applications to cooperative database systems , intelligent decision support systems , and intelligent planning and scheduling systems ; and computer architectural for processing large – scale knowledge – base / database systems . Recent correlated software packages should be used through labs.

IS 610 Knowledge Engineering

<div dir="rtl">

هندسة المعرفة

</div>

Focuses on current methods of implementing AI expert systems. Topics include the structure of problem – solving engines and knowledge bases for expert performance; problem taxonomies; methods to automate the acquisition of human experiential knowledge, methods to automate the explanation of problem-solving behaviour; examples of existing expert systems and their application areas. Recent correlated software packages should be used through labs.

IS 611 Knowledge Management and Decision Systems

<div dir="rtl">

إدارة المعرفة ونظم القرارات

</div>

The focus of this course is a blend of theories, approaches and technologies for managerial problem solving and knowledge management. The course reviews common fallacies and pitfalls in decision making and seeks to equip students with the knowledge of managerial techniques and information technologies for effective organizational decision making. Students will be exposed to methods and technologies for leveraging intellectual capital, both at an individual and firm level. Major topics of the course include "decision traps", problems in dynamic decision making, system thinking, decision support, and technologies that

facilitate knowledge sharing, knowledge management and organizational learning. Recent correlated software packages should be used through labs.

IS 612 Information system development methods and technologies

<div dir="rtl">

تكنولوجيا وطرق تطوير نظم المعلومات

</div>

This course examines the Systems Development Life Cycle and the technologies used to implement high-quality information systems. A variety of modeling techniques will be used by students to articulate client requirements and convert them into implementable specifications. Prototyping and methodology engineering will be covered. Recent correlated software packages should be used through labs.

IS 613 Legal and Ethical Issues in Information Systems

<div dir="rtl">

الإعتبارات الأخلاقية في نظم المعلومات

</div>

This course is a case-based survey of contemporary legal and ethical issues faced by IS professionals. Topics include a review of applicable statutes and regulations that impact the IS organization. Students will conduct on-line research and explore ethical issues at the leading edge of the organization's technology frontiers. Recent correlated software packages should be used through labs.

IS 614 Managing Organizational information resources

<div dir="rtl">

إدارة موارد المعلومات

</div>

Effective management of IT/IS function for competitive organizational performance. Issues and alternative solutions for managing information resources within/among organizations. Strategic and operational plans for the function; role of outsourcing; challenges of decentralization vs. centralization; management of IT professionals. Recent correlated software packages should be used through labs.

IS 615 Business Process Design and Implementation

<div dir="rtl">

تصميم وتطبيق إجراءات الأعمال

</div>

This course focuses on the design ,management, and implementation of IT-supported processes. The evolution of information technology and the near ubiquity of the internet give business firms the opportunity to completely redesign their business processes , to develop systems faster ,and to implement systems in entirely new ways. topics covered in this course include business process analysis and design ,implementation, change management ,and performance measurement systems relevant technologies include web-based application serve providers, workflow management systems ,and enterprise systems .students learns how to analyze a business problem ,design new business processes ,and manage the implementation

process .they also gain an understanding of the technology support structure required for successful implementation of organizational and interorganizational processes. Recent correlated software packages should be used through labs.

IS 616 Information Technology: Strategy and Management

إدارة تكنولوجيا المعلومات

This course discusses the role of information technology in corporate strategy along with key issues in managing information technology (IT).different generic strategies are discussed along with how IT plays a part in implementing strategy .Cases and lectures are used to demonstrate how technology can be used to both gain and sustain a competitive advantage. Emphasis in the course i on how IT can contribute to organizational effectiveness. the course also covers critical issues in managing the technology function as a strategic asset .the use of IT in corporate strategy depends on an appropriate technological infrastructure and on the ability of the firm to successfully manage its technology. Recent correlated software packages should be used through labs.

IS 617 Quality Assurance of Information Systems

تأكيد جودة نظم المعلومات

This course is about the theory and practice of software testing and quality assurance. The subject matter focuses on three broad areas:- theory of software testing . we review some of the relevant techniques and research results of software testing . the aim is to provide the student with a solid foundation form . Which to build real-world testing systems and teams. Testing in practice. We look at the process and practice of testing, including the role of tester in an iterative, incremental development project. Test automation. Test automation is essential for modern software testing. Several automation methods are discussed and a survey of tools, both commercially available ones and homegrown is performed. Recent correlated software packages should be used through labs.

IS 618 Information Risk Assessment and Security Management

إدارة تقييم مخاطر المعلومات

!The proliferation of corporate databases and the development of telecommunication network technology as gateways or invitations to intrusion are examined. Ways of investigating the management of the risk and security of data and data systems are presented as a function of design through recovery and protection. issues of risk and security as they relate to specific industries and government are major topics in the course .Examples are presented of how major technological advances in computer and operating systems have placed data , as tangible corporate assets , at risk . Quantitative sampling techniques for risk assessment and for qualitative decision making under uncertainty are explored. Recent correlated software packages should be used through labs.

IS 619 Multimedia information Systems

نظم معلومات الوسائط المتعددة

Concepts and methods of design, management, creation, and evaluation of multimedia information systems. Theory and practice of digital media production, reception , organization , retrieval , and reuse . Review of applicable digital technology with special emphasis on digital video . Course will involve group projects in the design and development of digital media applications. Recent correlated software packages should be used through labs.

IS 620 Financial Information Systems

نظم المعلومات المصرفية

This course investigates the role of information technology (IT) in financial market operations, an in enhancing the competitive performance of financial services firms. it examines the development and use of financial information systems such as trading and back-office processing systems .the objectives are to build an understanding of the IT impacts on banking and markets, to gain knowledge of the leading–edge applications of systems ,and to develop skills in implementing computer-based financial analysis and models. Recent correlated software packages should be used through labs.

IS 621 Designing and Developing Web-based Information Systems

تصميم وتطوير نظم المعلومات الشبكية

This course covers the management and development of web-based information systems. students will analyze ,design and develop web-enabled database applications using several different approaches.Emphsis will be on concepts and architecture of new technologies. topics include: the CGI processing model and its alternatives ,java applets, java servlets, JDBC;application service providers;multitier client-server computing ;object-oriented models; active server pages and other server-based processing alternatives; distributed business objects such as CORBA; text processing applications(PERL,awk,etc);and platform options (Windows NT vs. Unix). Recent correlated software packages should be used through labs.

IS 622 Electronic Commerce Infrastructure

البنية التحتية للتجارة الألكترونية

The purpose of this course is to introduce e-commerce, its impacts on business processes, and keys issues in the development of web-based business information systems and applications. The course reviews foundations of e-commerce, its infrastructure, current business models in business-to-customers (B2C) and business-to-business (B2B) transactions, security and quality assurance, and systems development issues. A major part of the course will be devoted to hands-on practices covering client-side (front-end) and server-side (back-end) applications in web-based business information systems. Essentials of contemporary programming tools for e-commerce development such as HTML, DHTML, XML, ASP (VB/JavaScript) ... will be explored. Once completing the course, students (future competent IS specialists) should be able to evaluate the information needs and requirements of a business entity wishing to adhere to e-commerce paradigm, and then participate in the development of

an appropriate information system to support these organizational needs. Recent correlated software packages should be used through labs.

IS 623 Managing the Digital Firm

إدارة الشركات الرقمية

This course focuses on the use of both traditional and web-based information technologies to manage the firm .these technologies make possible new business models, new organizational structures ,and new management processes .topics covered in new technology infrastructure and architecture, major functional applications of IT within the firm ,new IT-based business models, enterprise systems, knowledge management ,multinational systems ,managerial decisions about technology, and new organizational forms. Recent correlated software packages should be used through labs.

IS 624 Decision technologies for e-business

تكنولوجيا القرارات للأعمال الألكترونية

Decision technologies for financial ,supply chain ,marketing and strategic applications. comparisons between traditional and web-based decision support . neural nets ,genetic algorithms, evolutionary computing and data mining technologies; intelligent agent design ,construction and application; collaborative filtering and recommendation technologies ; spatial and demographic decision tools on the world wide web .coverage of the technologies will be paired with business applications in areas such as revenue yield management in the hospitality and travel industries , e-business intelligence in supply chain management, and support of consumer decision making for web-based purchasing. hands on experience with software tools. Recent correlated software packages should be used through labs.

IS 625 E-commerce in the financial services industry

التجارة الإلكترونية في صناعة الخدمات المالية

Organizational ,strategic and technology-focused consideration of e-commerce and traditional uses of system in the financial sevices.IT-focused business models of financial firms ;industry and firm technology infrastructures ,application (e.g., data mining of financial data on the web) and in-firm control technologies (risk management and payment security).IT in financial markets and investment management .e-brokerage on the internet, digital quote vendors, web-based IPOs.web-based and home banking systems, traditional and internet – based e-payment solutions , e-bill payment and presentment .hands on experience with software in the financial markets lab . Recent correlated software packages should be used through labs.

IS 626 Technologies for B2B E-commerce

<div dir="rtl">

تكنولوجيا التجارة الألكترونية

</div>

IT strategies, process design principles and information technologies for business-to-business e-commerce. Coverage of traditional firms ' planning process to establish e-business operational ,sales and web-based marketing capabilities. Economic analysis of bundling, aggregation and digital product pricing policies , and the role of technology standards and sponsored technologies in large-scale e-commerce .industry infrastructures for e-commerce , including security ,e-payment and transient data sharing and modeling approaches. Enabling technologies in business-to-business contexts. Financial justification of e-commerce and e-business technology investments. web sever and content management approaches for e-business ;development and design issues for large-scale e-commerce operations .hands on experience with e-commerce software development tools . Recent correlated software packages should be used through labs.

IS 627 E-Business System Solution

<div dir="rtl">

حلول نظام العمل الألكترونى

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This course focuses on analysis, design, development, and deployment of e-business solutions. Topics include World Wide Web site design, application development structures such as Java, ColdFusion, and CGI, Web database integration, hypermedia development tools, and implementation strategies. Recent correlated software packages should be used through labs.

IS 628 Information and Database System Security

<div dir="rtl">

أمان المعلومات وقواعد البيانات

</div>

The objective of this course is to introduce the security challenges and threats in database systems and provide an understanding of the state-of-the art security technologies. The course discusses policies, models and mechanisms to ensure confidentiality, integrity and availability. In particular, students will study about models and mechanisms for access control, integrity models and mechanisms, multi-level secure database architectures, inference problem, distributed transaction processing, recovery and fault tolerance, and security problems raised by data warehousing and data mining. Recent correlated software packages should be used through labs.

IS 629 Information Systems Integration

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تكامل نظم المعلومات

</div>

Modern information systems contain many purchased components, which must be selected, integrated, tested, and installed. This course addresses the skills required to develop system RFPs, evaluate and manage contracts and contractors, testing methodologies, installation planning, and outsourcing. Recent correlated software packages should be used through labs.

IS 630 Research Seminar in IS (I)

بحث دراسى فى نظم المعلومات 1

This course covers selected topics in information systems research, such as user information satisfaction, interface design evaluation, and groupware. Student synthesizes their material and prepares written and oral presentations .students produce a literature survey paper on their own topic and a research proposal. They then can execute their research with objective of producing a journal-quality paper. Recent correlated software packages should be used through labs.

IS 631 Research Seminar in IS (II)

بحث دراسى فى نظم المعلومات 2

In-depth study of major research topics in the field of information systems, led by members of the faculty. topics include database and knowledge-based systems, communications/networks and coordination technologies ,decision theory ,economics of information systems, advanced systems analysis and design ,and software engineering. Recent correlated software packages should be used through labs.

IS 632 Special Topics in Information Systems

موضوعات خاصة فى نظم المعلومات

The topics covered in this subject vary to maintain currency with current thinking and discussion in the information system profession. Students will choose or be given topics to be investigated either individually or in groups, and will perform library, on-line, and field research, prepare and deliver reports and presentations, and analyze and critically evaluate the reports and presentations of other students. Recent correlated software packages should be used through labs.

IS 633 Advanced Software Engineering

هندسة البرمجيات المتقدمة :

The aim of the course is to study and analyze advanced concepts, directions, principles and methodologies using the literature, text, and handouts that pertain to major goals, problems and issues in software engineering. The emphasis is to treat software design and system modeling in systematic and programmatic ways. The contents of the course are broadly divided into three parts: 1) Software reuse and design patterns. 2) System modeling and design as exemplified by discrete event system specification (DEVS). 3) Advanced research topics in software engineering. Recent correlated software packages should be used through labs.

GIS 300 Principles of Geographic Information Systems

مبادئ نظم المعلومات الجغرافية

Provides an introduction to Geographic Information Systems and their applications. Emphasizes the concepts needed to use GIS effectively for manipulating, querying, analyzing, and visualizing spatial-based data. Industry-standard GIS software is used to analyze spatial patterns in social, economic and environmental data, and to generate cartographic output from the analysis. Recent correlated software packages should be used through labs.

GIS 400 GeoDatabase Design

تصميم قواعد البيانات الجغرافية

The goal of this course is to introduce the main features of spatial databases, the kernel of Geographic Information Systems (GIS). Topics include: spatial concepts and data models, spatial query languages, spatial storage and indexing, query processing and optimization, spatial networks, introduction to spatial data mining. Exercises and practical work will be concentrated on building and designing geodatabases. Recent correlated software packages should be used through labs.

GIS 405 Digital Cartography and Visualization

الكارتوجرافيا الرقمية والتجسيد المرئى

An overview of the development of Cartography, the concepts, processes, techniques and data sources. The role of Cartography in digital mapping and Geographic Information Systems. Rules of graphical communication and the depiction of spatial data. The Cartographic process: need, data sources, evaluation, scale, reference base, projection, design specifications, compilation, production and final output. Graphical elements of design and symbolisation. Applications of the representation of spatially referenced data in the areas of sociological, economical, topographical and environmental The traditional and digital approaches to cartographic design, production methods and user/supplier requirements. Evaluation of the cartographic processes for applicability. The functionality of digital mapping programs and the cartographic software of Geographical Information Systems. The cognitive processes of spatial data capture and the present methods of data visualisation. Knowledge based map design techniques. Multimedia and virtual reality as visualisation techniques. Recent correlated software packages should be used through labs.

GIS 410 Spatial Data Acquisition Techniques and Quality Standards

تقنيات جمع البيانات الجغرافية ومراقبة الجوده

This course provides an introduction to surveying and mapping techniques of use to GIS professionals, including the Global Positioning System (GPS). Topics include: basic traditional survey methods, including horizontal and vertical location techniques; geodesy; data adjustments; datums and ellipsoids; coordinate systems; and transformations; understand

the issues surrounding data quality; learn the difference between terms such as precision, absolute accuracy, relative accuracy, classification accuracy, temporal accuracy, and thematic accuracy. Recent correlated software packages should be used through labs.

GIS 415 Principles of Remote Sensing

<div dir="rtl">

مبادئ الإستشعار عن بعد

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Basic principles of photogrammetry: stereoscopy, camera geometry. Aerial photography: cameras, calibration, flight planning. Introduction to analytical plotting methods and orientation procedures. Physical bases of remote sensing: electromagnetic radiation; basic laws of electromagnetic radiation; absorption, reflection and emission; atmospheric effects; radiation interactions with the surface; spatial resolution; temporal resolution. Trends in remote sensing: major satellite remote sensing programmes; operational systems; funding sources; commercialisation; science and applications development. Recent correlated software packages should be used through labs.

GIS 420 Selected Topics in GIS/RS

<div dir="rtl">

موضوعات مختارة في نظم المعلومات الجغرافية والإستشعار عن بعد

</div>

Topics which are not included in the curriculum and seems to be needed should be suggested as an elective course by GIS/RS department. Recent correlated software packages should be used through labs.

GIS 455 Spatial Analyses and Modeling Using GIS

<div dir="rtl">

التحليل والنمذجة باستخدام نظم المعلومات الجغرافية

</div>

This course explores methods of analyzing spatial data in the interactive and graphical environment of a GIS. The course draws on related theory in spatial statistics, geo-statistics, geographical analysis and cartographic modeling to provide a set of generic techniques for GIS users. Topics include the analysis of point patterns, networks, overlay analysis, spatial interaction models, and visualization of spatial data (virtual reality, simulation of landscape, animation, multi-media). The course concludes by considering how to extend the spatial analytical capabilities of GIS and points to the evolution of spatial decision support systems. Associated exercises and hands-on allow methods to be applied in a GIS context. Recent correlated software packages should be used through labs.

GIS 460 GIS Programming and Customization

<div dir="rtl">

برمجة نظم المعلومات الجغرافية

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Students learn to use the Visual Basic for Applications (VBA) programming environment to add functionality to ArcGIS. Students who successfully complete the course are able to automate repetitive tasks, customize the ArcGIS interface, and share their customizations with others. Recent correlated software packages should be used through labs.

GIS 465 Web-based GIS

<div dir="rtl">

نظم المعلومات الجغرافية الشبكية

</div>

Provides a conceptual overview and hands-on experiences in Internet mapping and web-based geospatial information processing with state-of-the-art commercial software. Topics covered included client/server configuration, distributed data access and display, web-based user interaction and customization. Recent correlated software packages should be used through labs.

GIS 470 GIS Management and Implementation

<div dir="rtl">

إدارة وتنفيذ نظم المعلومات الجغرافية

</div>

Management strategies for GIS are examined by presenting GIS as an integrated system of people, computer hardware, software, applications and data. Implementation is examined as a systematic process of user needs assessment, system specification, database design, application development, implementation, operation, and maintenance. Includes design of implementation plans as case studies to explore various techniques associated with each step of this process. Recent correlated software packages should be used through labs.

GIS 475 Selected Topics in GIS/RS

<div dir="rtl">

موضوعات مختارة في نظم المعلومات الجغرافية والإستشعار عن بعد

</div>

Topics which are not included in the curriculum and seems to be needed should be suggested as an elective course by GIS /RS department. Recent correlated software packages should be used through labs.

GIS 450 Project

<div dir="rtl">

المشروع

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This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted.

GIS 500 Fundamentals of Geographic Information Systems

أساسيات نظم المعلومات الجغرافية

Discusses fundamental GIS concepts and terminology, the role of GIS in spatial data management and digital mapping, the multipurpose cadastre and resource GIS, methods of data collection and input, data modelling and representation, storage and retrieval of spatial data, concepts of database systems, manipulation and analysis features of GIS. Recent correlated software packages should be used through labs.

GIS 505 Fundamentals of Remote Sensing

أساسيات الإستشعار عن بعد

This course is designed to provide students with the basic knowledge of biophysical, quantitative, and digital remote sensing. Both the theoretical basis and practical aspects of these approaches to remote sensing are addressed. Topics examine include remote sensing applications in natural environment such as meteorology, oceanography, hydrology, and biomass detection. Recent correlated software packages should be used through labs.

GIS 510 Spatial Data Acquisition Techniques and Quality Control

تقنيات جمع البيانات الجغرافية ومراقبة الجوده

This course introduces methods of surveying field collection of data in a manner suitable for spatial analysis. Topics will include plane and topographic surveying, use of the levels, total stations, and the Global Positioning System (GPS), preparation of data for conversion to a digital format, map generation from surveying field data, accuracy, and quality of spatial data. The course has a main field and laboratory components. Recent correlated software packages should be used through labs.

GIS 515 Visualization of Geographic Information

التجسيد المرئى للمعلومات الجغرافية

This course provides familiarity with a broad range of approaches to visualising spatial data: statistical graphing, traditional cartographic representations, 3-D surface rendering, and pseudo 4-D representations and animation. An appreciation of hyper-media, multimedia, and electronic atlases is also developed. It aims to appreciate the choices and challenges in visualizing spatial information by discussing what should be shown in maps and diagrams; use of cartographic variables, especially colour; types of views of data; transformations in visualization; provide an appreciation of hyper-media and multimedia, and the role of electronic atlases. Recent correlated software packages should be used through labs.

GIS 555 Advanced Spatial Analysis and Modeling

التحليل والنمذجة الجغرافية المتقدمة

Treatment of more advanced topics in the application of spatial analysis in a GIS environment. Topics covered include raster-based cartographic modeling, 3-d visualization, geostatistics and network analysis. Student will be acquainted with state-of-the-art software through hands-on laboratory experiences. Recent correlated software packages should be used through labs.

GIS 560 Selected Topics in GIS

موضوعات مختارة فى نظم المعلومات الجغرافية

Topics which are not included in the curriculum and seems to be needed should be suggested as an elective course by GIS department. Recent correlated software packages should be used through labs.

GIS 565 GIS Management and Implementation

إدارة وتنفيذ نظم المعلومات الجغرافية

Management strategies for GIS are examined by presenting GIS as an integrated system of people, computer hardware, software, applications and data. Implementation is examined as a systematic process of user needs assessment, system specification, database design, application development, implementation, operation, and maintenance. Includes design of implementation plans as case studies to explore various techniques associated with each step of this process. Recent correlated software packages should be used through labs.

GIS 570 Selected Topics in RS

موضوعات مختارة في الإستشعار عن بعد

Topics which are not included in the curriculum and seems to be needed should be suggested as an elective course by GIS/RS department. Recent correlated software packages should be used through labs.

GIS 550 Project

المشروع

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted.

GIS 600 Geographic Information Science Theories, Models and Issues

موضوعات، نماذج، و نظريات علم المعلومات الجغرافية

Provides an understanding of the theory, data models and associated issues (such as uncertainty) that underlie GIScience and the way these are applied to, and effect, spatial analysis and spatial data management. Recent correlated software packages should be used through labs.

GIS 601 Advanced Topics in GIS

موضوعات متقدمة فى نظم المعلومات الجغرافية

This is an advanced course designed to increase the student's understanding of advanced applications and current research in geographic information systems. The two main objectives of the course are (1) to acquire advanced knowledge of the fundamental concepts in GIS, and (2) become familiar with current applications of GIS technology for effective spatial analysis and the communication of geographic information. The first portion of the course will be traditional lecture/laboratory-based teaching that examines advanced core concepts of GIS. The second portion of the course will focus on student-based research about current applications of GIS for spatial analysis and modelling. Students will conduct independent research on topics of their choice, and convey this information to the class via an oral presentation and a web-based independent research project. Recent correlated software packages should be used through labs.

GIS 602 Location Based Services and Web-based GIS

تحديد أماكن الخدمات و نظم المعلومات الجغرافية الشبكية

The course focuses on the new techniques for linking between telecommunication (mobile equipments), Global Positioning Systems (GPS), and GIS (Location Based Services-LBS), and deployment of spatial data on the Internet (Web-based- GIS). Recent correlated software packages should be used through labs.

GIS 603 Spatial Data Acquisition Techniques

تقنيات جمع البيانات الجغرافية

This course introduces methods of surveying field collection of data in a manner suitable for spatial analysis. Topics will include plane and topographic surveying, use of the levels, total stations, and the Global Positioning System (GPS), preparation of data for conversion to a digital format, map generation from surveying field data, accuracy, and quality of spatial data. The course has a main field and laboratory components. Recent correlated software packages

should be used through labs.

GIS 604 Advanced Geographical Visualization Techniques

<div dir="rtl">

طرق التجسيد المرئى لنظم المعلومات الجغرافية المتقدمة

</div>

This course provides familiarity with a broad range of approaches to visualising spatial data: statistical graphing, traditional cartographic representations, 3-D surface rendering, pseudo 4-D representations and animation. An appreciation of hyper-media, multimedia, and electronic atlases is also developed. It aims to appreciate the choices and challenges in visualizing spatial information by discussing what should be shown in maps and diagrams; use of cartographic variables, especially colour; types of views of data; transformations in visualization; provide an appreciation of hyper-media and multimedia, and the role of electronic atlases. Recent correlated software packages should be used through labs.

GIS 605 Advanced Spatial Analyses and Modeling

<div dir="rtl">

التحليل والنمذجة الجغرافية المتقدمة

</div>

Treatment of more advanced topics in the application of spatial analysis in a GIS environment. Topics covered include raster-based cartographic modeling, 3-d visualization, geostatistics and network analysis. Student will be acquainted with state-of-the-art software through hands-on laboratory experiences. Recent correlated software packages should be used through labs.

GIS 606 Advanced Spatial Database Design

<div dir="rtl">

تصميم قواعد البيانات الجغرافية المتقدمة

</div>

Students develop the fundamental knowledge of spatial database systems. Covers spatial data models, spatial query languages, database architecture, and database technology for spatial database systems. Storage structures, file organization, general and spatial index structures, implementation of relational and spatial operators, spatial query processing and optimization, transaction management and crash recovery, distributed spatial database systems. Recent correlated software packages should be used through labs.

GIS 607 Spatial Data Mining

<div dir="rtl">

إستخلاص البيانات الجغرافية

</div>

Spatial data mining is the branch of data mining that deals with spatial (location) data. This course focuses on algorithm techniques that can be used for spatial data mining tasks such as classification, association rule mining, clustering, and numerical prediction. This includes probabilistic and statistical methods, genetic algorithms and neural networks, visualization techniques, and mathematical programming. We also place such data mining within the larger picture of knowledge discovery in databases and in particular its relationship with data warehousing. We will consider numerous case studies from different application areas such as remote sensing, ecology, weather, natural disasters, public health, transportation, and

criminal analysis. Recent correlated software packages should be used through labs.

GIS 608 Spatial Reasoning

الإستنباط الجغرافى

Qualitative representations of geographic space. Formalisms for topological, directional and metric relations; inference mechanisms to derive composition tables; geometric representations of natural language-like spatial predicates; formalizations of advanced cognitively motivated spatial concepts, such as image schemata; construction of relation algebras. Recent correlated software packages should be used through labs.

GIS 609 Spatio-Temporal Data Modeling

نمذجة البيانات الجغرافية المؤقتة

Introduces concepts necessary for designing and using a spatio-temporal information system. Covers formal models of time, conceptual models of time, fundamentals of temporal databases spatio-temporal database systems, spatio-temporal query languages, event-based modeling and the visualization of temporal data. Recent correlated software packages should be used through labs.

GIS 610 Reasoning With Uncertainty in Spatial Information Systems

الاستنباط الغير مؤكد لنظم المعلومات الجغرافية

Information systems and artificial intelligence approaches to uncertainty handling in spatial information systems. Typology of uncertainty: imprecision, inaccuracy and inconsistency. Representing and reasoning with spatial uncertainty in information systems. Logics of uncertainty, probabilistic and Bayesian approaches, Dempster-Shafer theory of evidence. Spatial vagueness. Handling conflicting information. Recent correlated software packages should be used through labs.

GIS 611 Advanced Raster Modeling

النمذجة المتقدمة للبيانات الشبكية

Examines advanced topics in raster modeling beyond those discussed in Spatial Analysis and Modeling Course. Recent correlated software packages should be used through labs.

GIS 612 GIS Network Modeling

نمذجة الشبكات باستخدام نظم المعلومات الجغرافية

Examines the theory of network analysis and its application in Geographic Information Systems. Topics covered include graph theoretic measures of network connectivity and proofs of network properties; optimization problems including shortest path algorithms, flow algorithms, and assignment problems on networks; special solution procedures for the classic

transportation problem; procedures for linear referencing and urban travel demand modeling. The implementation of these algorithms and procedures with GIS data structures is explored using industry standard GIS software. Recent correlated software packages should be used through labs.

GIS 613 Geocomputation

<div dir="rtl">الحسابات الجغرافية</div>

The increasing volume and complexity of available digital geographic data overwhelms traditional analytical modeling methods. Alternatively, we can exploit the increasing power of computational environments to analyze geographic phenomena with a minimum of simplifying assumptions. This course is a high-level introduction to the use of computational intelligence methods for exploring, analyzing, modeling and simulating geographic phenomena. Techniques discussed include heuristic search in spatial optimization, pattern recognition and machine learning techniques and simulating complex spatio-temporal systems. Recent correlated software packages should be used through labs.

GIS 614 Geometrics and Digital terrain modelling

<div dir="rtl">نمذجة التضاريس</div>

This course introduces the technical aspects of Geomatics, including digital terrain modeling, photogrammetry and geodesy. Although the use of remotely sensed data within these fields is emphasized, aspects of ground-based measurement will also be reviewed. Case studies are used to illustrate the techniques described. The course begins by considering the use of satellite positioning for geodesy, surveying and navigation (Global Positioning Systems). The course continues by examining the use of remote sensing data, from aircraft and satellites, for measuring spatial properties of the earth, using a range of data sources such as photographs, optical scanners, radar imagers and lidar. A discussion of radar interferometry for determining ground elevation and centimetre-scale ground displacements is included. Recent correlated software packages should be used through labs.

GIS 615 GIS Data Models and Data Structures

<div dir="rtl">هياكل و نماذج البيانات الجغرافية</div>

This course provides an introduction to GIS data models and data structures, both spatial and nonspatial. The spatial (or attribute) database models are described, with particular emphasis on relational and Object-Oriented database design. The course continues with systematic overview of spatial data models (e.g. raster and vector) and the structures used to implement these, together with methods of spatial addressing. Methods of extending these models into 3D and representing temporal change are explained. Hybrid models for GIS are contrasted with integrated   systems, where both coordinate   and attribute data are stored together. Practical work concentrates on database design and explores the use of the Oracle DBMS and SQL in a GIS context. Recent correlated software packages should be used through labs.

GIS 616 GIS-based locational Modeling

<div dir="rtl">نمذجة الاماكن باستخدام نظم المعلومات الجغرافية</div>

This course considers certain locational problems which are of interest to public and private sector decision-makers and ways of modeling them viewed in a GIS context. Location/allocation models are typically concerned with locating supply points for a public-sector service (e.g. health/recreation centres or fire stations). To give the best possible access to the population served. Spatial interaction models have been used to estimate various flows and their impact on the urban system. Other problems discussed include Electoral Districting and the identification of significant Clusters (in an epidemiological context). This course requires some computer programming experience. Recent correlated software packages should be used through labs.

GIS 617 GIS-based Environmental Modeling

<div dir="rtl">النمذجة البيئية باستخدام نظم المعلومات الجغرافية</div>

This course provides an introduction to the theory and practical application of modeling environmental systems and their integration with GIS technologies. Emphasis will be placed on the variety of approaches to modeling, their characteristics and limitations. Case studies will be used to illustrate these approaches and to demonstrate shared principles and practices over a variety of natural systems. The links between models and GIS within the context of data structures, spatial analysis, and visualization will be stressed. Practical and individual project work will focus on the requirements for the design and implementation of models. Recent correlated software packages should be used through labs.

GIS 618 GIS-Based Spatial Decision Support Systems

<div dir="rtl">نظم دعم القرارات الجغرافية</div>

This course introduces students to key theories, concepts and techniques that have been developed recently to improve the decision support capabilities of spatial information systems. Topics covered include participatory GIS, group-based spatial decision support systems, and the integration of multi-criteria analysis (MCA) methods with GIS to facilitate decision making in planning. Recent correlated software packages should be used through labs.

GIS 619 Advanced GIS Management and Implementation

<div dir="rtl">ادارة وتنفيذ نظم المعلومات الجغرافية المتقدمة</div>

Advanced management strategies for GIS are examined by presenting GIS as an integrated system of people, computer hardware, software, applications and data. Implementation is examined as a systematic process of user needs assessment, system specification, database design, application development, implementation, operation, and maintenance. Includes design of implementation plans as case studies to explore various techniques associated. Recent correlated software packages should be used through labs.

GIS 620 Research Seminar IN GIS

حلقة بحثيه فى نظم المعلومات الجغرافية

Provides faculty supervision of research conducted by a student. Recent correlated software packages should be used through labs.

GIS 621 Advanced Digital Remote Sensing

الإستشعار عن بعد المتقدم

Advanced techniques of image processing and analysis for remotely sensed digital data. Topics include radiometric correction, geometric correction, atmospheric and ground effects, image enhancement, spectral analysis, colour processing, math operation, image filtering, Hyper-spectroscopy and imaging spectroscopy, noise suppression, image classification, post-classification and change detection, practical exercises based on satellite datasets and other forms of remotely sensed data. The course develops and expands topics in the area of image processing as a necessary pre-requisite to advanced studies in remote sensing. Hands-on and lab exercises complement the course. Recent correlated software packages should be used through labs.

GIS 622 Radar Remote Sensing

الاستشعار عن بعد الرادارى

Principles and applications of orbital and airborne radar remote sensing, including real and synthetic aperture radar systems. Principles of Radargrammetry and single-path and repeat-path interferometry. Applications of radar remote sensing in geosciences, land use and land cover mapping, forestry and agriculture, urban analysis. Recent correlated software packages should be used through labs.

GIS 623 3D Data Capture and Ground LIDAR

تجميع البيانات باستخدام نظم الاستشعار عن بعد

The use of reflectorless lasers is rapidly expanding in many activities including geosciences, GIS, engineering, surveying, architecture, facility and utility management.This course will cover the basics, advances and applications of ground reflectorless laser scanners for capturing the 3D man made and natural features. An emphasis will be the acquisition and utilization of point clouds from high data rate fast scanners ("ground LIDAR") and their unique requirements and problems . These data will be integrated with GPS and other sensors such as cameras. We will review case histories and carry out a variety of applications depending on the interests of the class. 3D visualization and analysis of such data sets will be covered. Recent correlated software packages should be used through labs.

GIS 624 Applied Remote Sensing

<div dir="rtl">

تطبيقات الاستشعار عن بعد

</div>

Focuses on the application of remote sensing techniques to solving real world urban and environmental problems in areas such as urban and suburban landscape, lane use and land cover, transportation and communication, vegetation and forestry, biodiversity and ecology, water and water quality control, soils and minerals, geology and geomorphology studies. The current generation, industry standard software is used for labs and applications development. Recent correlated software packages should be used through labs.

GIS 625 Global Positioning System Satellite Surveying Techniques

<div dir="rtl">

تحديد المواقع باستخدام الاقمار الصناعية

</div>

The theory and application of satellite positioning utilizing the Global Positioning System Code and phase methodology in field observations, data processing and analysis of Differential GPS, high accuracy static and other rapid measurements, in real time and with post-processing. Recent correlated software packages should be used through labs.

GIS 626 Urban and Environmental Applications of GIS/Remote Sensing

<div dir="rtl">

التطبيقات البيئية و المدنية لنظم المعلومات الجغرافية و الاستشعار عن بعد

</div>

This course focuses on the application of remote sensing and GIS techniques to solving real-world urban and environmental problems. Applications may include analyses of urban and suburban landscape, land use and land cover, and communication, vegetation and forestry, biodiversity and ecology, water and water quality control, soils and minerals, geology and geomorphology, etc. Recent correlated software packages should be used through labs.

GIS 627 Remote Sensing and GIS for Petroleum

<div dir="rtl">

تطبيقات الاستشعار عن بعد و نظم المعلومات الجغرافية فى البترول

</div>

This course explores algorithms for spatial analysis, 3D modeling in GIS, types satellite data and GIS data used for conducting optimum oil exploration operations, uses of GIS in mineral and hydrocarbon exploration, and in geological, and structural studies. Advanced application of multi spectral imagery, radar and other remote sensing data to oil industry environments with emphasis on the different digital image processing techniques utilized for specific petroleum problem, volume distribution of petroleum products, thematic mapping of petrol stations by brand, ownership, price, volume, shop size or by any geography, develop sales territories, locating optimal position of a new outlet. Further develops hands-on skills with industry-standard GIS software for application in geologic and geophysical analysis. Recent correlated software packages should be used through labs.

GIS 628 Research Seminar in RS

<div dir="rtl">

حلقة بحثيه فى الاستشعار عن بعد

</div>

Provides faculty supervision of research conducted by a student.

GIS 629 Research Seminar in GIScience (I)

<div dir="rtl">

حلقة بحثيه فى علم المعلومات الجغرافية1

</div>

Provides faculty supervision of research conducted by a student.

GIS 630 Research Seminar in GIScience (II)

<div dir="rtl">

حلقة بحثيه فى علم المعلومات الجغرافية2

</div>

Provides faculty supervision of research conducted by a student.

المحتويات العلمية لمقررات القسم العلمى

تكنولوجيا المعلومات

IT100 Electronic Physics

فيزياء الإلكترونيات

Electrical sources, electrical circuit elements, Ohm's law, Kirshoffs laws, solution of AC circuits, superposition theorem, substitution theorem, Thevenin's and Norton's theorems, compensation theorem, four-pole networks, electric power, maximum power transfer theorem, diodes, transistors, field effect transistors, operational amplifiers and their basic circuits and applications. Recent correlated software packages should be used through labs.

IT 150 Digital Logic Design

التصميم المنطقي

Numbering systems, logic functions and logic gates. Boolean algebra. Combinational circuits: Simplification of logic circuits using Karnaugh maps and tabulation method. Gate level design, adders, subtracters, encoders and decoders, multiplexers and demultiplexers. MSI Design, Programmable devices (ROM, PAL, PLA,....).Sequential circuits: Flip-flops, latches, analysis and design of simple sequential circuits, state tables and state diagrams, counters, registers, RAMs. Integrated circuits and logic families. Recent correlated software packages should be used through labs.

IT 200 Computer Architectures and Assembly Language

معمارية الحاسب ولغة التجميع

An introduction to computer architecture. Includes a survey of computer architecture fundamentals exemplified in commercially available computer systems, including classical CPU and control unit design, register organization, primary memory organization and access, internal and external bus structures, and virtual memory schemes. Alternatives to classical machine architecture, such as the stack machine and the associative processor, are defined and compared. Parallel processors and distributed systems are also presented, along with an analysis of their performance relative to nonparallel machines. Recent correlated software packages should be used through labs.

IT 300 Computer Graphics

الرسم بالحاسب

This course examines one or more selected current issues in the area of image synthesis. Specific topics covered are dependent on the instructor. Potential topics include: scientific visualization, computational geometry, photo-realistic

image rendering and computer animation. Recent correlated software packages should be used through labs.

IT 305 Computer Networks

شبكات الحاسب

The principles and practice of computer networking, with emphasis on the Internet. The structure and components of computer networks, packet switching, layered architectures, OSI 7 layer model, TCP/IP, physical layer, error control, window flow control, local area networks (Ethernet, Token Ring; FDDI), network layer, congestion control, quality of service, multicast. Recent correlated software packages should be used through labs.

IT 350 Multimedia Systems

الوسائط المتعددة

Organization and structure of modem multimedia systems; audio and video encoding. Quality of service concepts; Screen resolution and screen technology, video accelerator design system, raster graphics (3D- transformation), analog-to- digital conversion, video compression, mixing and displaying at 30 FPS with full color capacity. Physics of sound, sound cards, sound cards limitations, mixing sound video and voice traffic control, animation. Scheduling algorithms for multimedia within OS and networks; multimedia protocols over high-speed networks; synchronization schemes; user-interface design; multimedia tele services. Recent correlated software packages should be used through labs.

IT 355 Internet Technologies & Programming

تكنولوجيا الإنترنت و برمجتها

The aim of this course is to teach the students the fundamental technologies and techniques for creating applications on the World Wide Web (WWW). It will consider the architecture of the Web, static techniques for providing content such as HTML and CSS, and dynamic techniques such as client and server side scripting.At the end of the course the student should be able to discuss the architecture of the Web and write static web pages. Students will also be able to create dynamic web content, in particular, content obtained from a database. Students will be aware of the need for sessions for interactive web applications and how to establish sessions. Recent correlated software packages should be used through labs.

IT 400 Computer Animation

الرسومات المتحركة

Kinematics and techniques for character animation. Topics include physical modeling and simulation, motion planning, control and learning algorithms,

locomotion, motion trajectory optimization, scripting languages, motion capture and motion editing. Students will implement algorithms and interactive animation tools. Recent correlated software packages should be used through labs. Recent correlated software packages should be used through labs.

IT 405 Digital Signal Processing

معالجة الإشارات الرقمية

The course examines types of multimedia information: voice, data video facsimile, graphics, and their characterization; modeling techniques to represent multimedia information; analysis and comparative performances of different models; detection techniques for multimedia signals; specification of multimedia representation based on service requirements; and evaluation of different multimedia representations to satisfy user applications and for generating test scenarios for standardization. Recent correlated software packages should be used through labs.

IT 410 Wireless & Mobile Networks

الشبكات اللاسلكية و المحمولة

This course will cover :Mobility Management, Handoff Management: Detection and Assignment, Radio Link Transfer ,Network Signaling, Intersystem Handoff and Authentication in IS-41 ,Roaming ,Example networks: Cellular Digital Packet Data, GSM, General Packet Radio Service (GPRS), WLAN ,Mobile Number Portability, User Mobility, Device Mobility, Economic models, such as, Prepaid, Flat rate, Mobile Services ,Heterogeneous networks . Recent correlated software packages should be used through labs.

IT 415 Virtual Reality

الواقع الإفتراضي

Design and implementation of software systems necessary to create virtual environments; techniques for achieving real time, dynamic display of photorealistic, synthetic images; hands-on experience with electromagnetically tracked, head mounted displays. Final project requires the design and construction of a virtual environment. Recent correlated software packages should be used through labs.

IT 420 Selected Topics In IT

موضوعات مختارة في تكنولوجيا المعلومات

This course aims at introducing students to novel topics in information Technology that need to be identified in a responsive manner as technology and its use evolve and develop. This course is essentially a flexibility enhancing will be filled on a year-by-year basis. Recent correlated software packages should be used through labs.

IT 455 Computer Interfacing

<div dir="rtl">مواجهات الحاسبات</div>

This course will cover a variety of advanced topics in multimedia design, with emphasis on techniques for creation of interactivity, and on networked multimedia. Topics to be covered will include: the HTML-JavaScript-Java software complex as a vehicle for multimedia production. Comparisons with Lingo and Director. Potential improvements to HTML. VRML as a possible 3D replacement of the 2D graphics of Director. Bandwidth considerations. New graphic concepts, including the 'Pad' zoom able interface. Text searching. Morphing. Recent correlated software packages should be used through labs.

IT 460 Network Security

<div dir="rtl">أمان الشبكات</div>

Discussion of the need for network security, describe various threats, attack types and hackers. Explain authentication, encryption & encryption standard. Secret-Key, public key algorithm authentication protocols, digital certificate. Virtual private network, (VPN), secure sockets layer (SSL). Firewalls, and firewalls topology, packet filters and proxy servers. Threats and couther measures in centralized and distributed systems; communication security techniques based on encryption; symmetric and asymmetric encryption; encryption modes, including stream and block encryption, and cipher-block chaining; message origin and mutual authentication; third-party and inter-realm authentication; authentication of mobile users; data confidentiality and integrity protocols; formal analysis of authentication protocols and message integrity; access control in distributed systems and networks; firewall design; case studies of security mechanisms and policies. Recent correlated software packages should be used through labs.

IT 465 Image Processing

<div dir="rtl">معالجة الصورة</div>

Scope and applications of image are processing. Perspective transformations (Modeling picture taking, perspective transformations in homogeneous coordinates and with two reference frames). The spatial frequency domain (The sampling theorem, template matching and the convolution theorem, spatial filtering). Enhancement and restoration, image segmentation. Image representation: (Spatial differentiation and smoothing, template matching, region analysis, contour following). Descriptive methods in scene analysis. Hardware and software considerations. Applications. Recent correlated software packages should be used through labs.

IT 470 Robotics

الإنسان الآلي

Introduction to Robotics; Co-ordinate systems(Cartesian, cylindrical ; Polar and Revolute systems) ; Robot Arms(Axes, ranges , Off-set and In-line Wrist, Roll, Pitch and Yaw); End Effectors; Sensors (Micro-switches, Resistance Transducers, Peizo-electric, infrared , Laser and Vidicon Tubes); Application of sensors (Reed Switches, Ultra Sonic, Bar Code Readers) ; Hydraulic system units (pumps, valves, solenoids, cylinders) ; Electrical system units (stepper motors , encoders and AC motors); programming of Robots ; Safety considerations. Recent correlated software packages should be used through labs.

IT 450 Project

المشروع

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted

IT 551 Communication Technology

تكنولوجيا الإتصالات

This program introduces information and communication technology (ICT) concepts, and provides students with the opportunity to obtain knowledge and skills required to effectively solve organizational, economic, regulatory and socio-technical problems that arise in the implementation and application of information technology (IT). Recent correlated software packages should be used through labs.

IT 552 Advanced Computer Architecture.

عمارة الحاسب المتقدمة

This course introduces the fundamentals of computer system architecture and organization. Topics include CPU structure and function, addressing modes, instruction formats, memory system organization, memory mapping and hierarchies, concepts of cache and virtual memories, storage systems, standard local buses, high-performance I/O, computer communication, basic principles of operating systems, multiprogramming, multiprocessing, pipelining and memory management. The architecture principles underlying RISC and CISC processors are presented in detail. The course also includes a number of design projects, including simulating a target machine, architecture using a high-level language (HLL).(Prerequisites: Undergraduate course in logic circuits and microprocessor system design, as well as proficiency in assembly language and a structured high-level language s). Recent correlated software packages should be used through labs.

IT 554 Digital Signal Processing

معالجة الإشارات الرقمية

This course will cover : Overview of DSP: LTI systems, Z-transform and DTFT, Connecting Analog & Digital Worlds: Sampling, A/D, D/A, Cost-Benefit trade-offs of over sampling, Multirate signal processing, Filter Banks, Wavelets and Applications to mp3 and JPEG , Overview of FIR and IIR filter design techniques, DFT, FFT, and role of DCT in MPEG and JPEG, Spectral Analysis. Recent correlated software packages should be used through labs.

IT 500 Data Compression

ضغط البيانات

A main objective for the course is to give the students basic knowledge of the theory and practice of data compression, and experience with both theoretical and practical problem-solving. The course covers two main areas of data compression: lossless compression techniques and lossy compression techniques In lossless data compression, the goal is to represent a digital data source with as few bits as possible, while still maintaining the

possibility to reconstruct the original data perfectly; the process is invertible. The theoretical basis is given by information-theoretic concepts such as entropy and mutual information. Well-known techniques, Lossy compression deals mainly with analog sources such as speech, audio, images and video signals. The goal is again to represent the source in digital form, using as few bits as possible. Here, some coding losses are inevitable, and the algorithms must partly rely on the imperfections of the human ear and eye. Important concepts that will be studied in lossy compression are various transforms (wavelets, DCT, etc), linear prediction, and Scalar/vector quantization. The applications include speech and audio coding algorithms, such as CELP, MP3, and the GSM mobile telephony algorithms, and image/video coding algorithms, such as JPEG and various MPEG video coding standards. Recent correlated software packages should be used through labs.

IT 501 Advanced Computer and Communication Network

الحاسب وشبكات الإتصالات المتقدمة

This course covers advanced topics in the theory, design and performance of computer and communication networks. Topics will be selected from such areas as local area networks, metropolitan area networks, wide area networks, queuing models of networks, routing, flow control, new technologies and protocol standards. The current literature will be used to study new networks concepts and emerging technologies. Recent correlated software packages should be used through labs.

IT 503 Pattern Recognition

التعرف على الأنماط

This course is an introduction to the subject of pattern recognition. We will cover theoretical foundations of classification and pattern recognition and discuss applications in character, speech and face recognition, and some applications in automation and robotics. A tentative list of topics includes: Bayesian decision theory, discriminate functions for normal class distributions, parameter estimation and supervised learning, nonparametric techniques (nearest neighbor rules, Parzen kernel rules, tree classifiers), linear discriminate functions and learning (perceptron, LMS algorithms, support vector machines), unsupervised learning and clustering, neural networks including multilayer perceptrons and radial basis networks, and machine learning. Recent correlated software packages should be used through labs.

IT 550 Project:

المشروع

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted.

المحتويات العلمية لمقررات القسم العلمى

دعم القرار

DS 150 Fundamentals of Management

أساسيات الإدارة

Introduction to management science, principals of organization structures and their categories, inventory models, analysis cost volume profit, objectives and methodologies of resource management, skills needed to effective management renewable and natural resources. Decision making processes and financial management, accounting management, marketing, and human resource management. Recent correlated software packages should be used through labs.

DS 200 Operation Research:

بحوث العمليات

This course is an introduction to the use of quantitative methods in business decision-making. Topics include linear programming, decision making under certainty, forecasting, queuing, and inventory systems. Recent correlated software packages should be used through labs.

DS 250 Project Management

إدارة المشروعات

This course contains evaluation, selection and organization of technical projects. Concepts of the network-based project management methodology Network development. Project planning, scheduling, and control, Project cost management. Resource constrained projects. Commercial software packages will be used throughout the course. The course will also introduce some contemporary project management subject such as: e-projects, and intelligent project management. Recent correlated software packages should be used through labs.

DS 350 Computer Simulation Technique :

المحاكاة بالحاسب

This course includes basic simulation modeling, nature of simulation, system models and simulation, discrete event simulation, simulation of single-server queuing system, Simulation of an inventory system, list processing in simulation , simulation language, simulation of time sharing systems, simulation output data and stochastic processes, building valid and credible simulation models, principles of valid simulation modeling, verification of simulation modeling computer programs, An approach for developing valid and credible simulation output data, and output data analysis for a single system. Recent correlated software packages should be used through labs.

DS 400 Advanced Project Management

إدارة مشروعات متقدمه:

This course includes project management body of knowledge (PMBOK) and project management systems, pricing and estimating, project risk management, managing multiple projects and enterprise project management, communication skills, effect of concurrent engineering, critical chain project management, dependency structure matrix, object oriented project management. Recent correlated software packages should be used through labs.

DS 405 Decision and Game Theory

نظرية المباريات والقرارات

This course includes basic concepts of decision making under certainty, risk and uncertainty, The use of decision tables, decision trees and sequential decision-making, opportunity loss, one-time decisions and expected value of information, conditional probability and decision analysis, multiple comparison and multiple ranking methods, examining the many facets of game theory, such as bargaining theory, non-cooperative games, cooperative games, games with incomplete information, several cases studies will be used to illustrate the application of decision theory to real world problems beside using commercial software package. Recent correlated software packages should be used through labs.

DS 410 Stochastic Models in Operations Research and Decision Support

النماذج العشوائيه فى بحوث العمليات ودعم القرار

This course covers a review of probability distributions and random variables. Markov chains, markov analysis, applications of markov chain in management science and decision support , random walk poisson process, truncated poisson process, pure birth process, pure death process, birth and death process, and their applications in operations research and decision support models. An introduction to queuing systems, single and multi-stage queuing models, queuing network models. Formulation and solution approaches of operation research models involving random variables or events, standard software packages are used as training tools in this course. Recent correlated software packages should be used through labs.

DS 415 Inventory Control and Production Management :

مراقبة المخازن و إدارة الإنتاج

  This course includes introduction to a variety of production planning and inventory control problems, The development of mathematical and simulation model required to solve these problems, job-shop scheduling, work methods, maintenance and quality management topics will be covered, supply chain management, facility layout, statistical quality control, inventory management (independent and dependent inventory models), solution approaches including the use of the available operation management software packages. Recent correlated software packages should be used through labs.

DS 420 Selected Topics In (Operations Research and Decision Support) :

<div dir="rtl">

موضوعات مختارة في بحوث العمليات ودعم اتخاذ القرار

</div>

 The course focuses on the new trends and future prospects of operations research and decision support systems, Large-scale, stochastic, fuzzy, and using of intelligent tools are some examples of the proposed topics. Real and practical application are case studies of operation research and decision support systems in different fields are recommends, examples of these fields are : computer application, risk analysis, banking, logistics, military, chemical, oil industry, production, agriculture, airspace, education, naval transport, and others, Recent papers and publication on operation research and decision support systems can be used to inform students about recent trends and to train them reading and understanding scientific writing. Recent correlated software packages should be used through labs.

DS 455 Strategic and Crisis Management :

<div dir="rtl">

الإدارة الإستراتيجية و إدارة الأزمات

</div>

  This course includes draws from all functional areas of an enterprise to provide strategic directions to an organization. Strategies are offered to ensure success on a competitive" for profit" environment. A framework is developed to understand the interrelation of accounting, finance, operation, engineering, and marketing. Concepts and fundamentals of crises management, resolving crises, and types of crises are introduced. Applications and use of software packages are stressed throughout the course. Recent correlated software packages should be used through labs.

DS 460 Decision and Risk Management :

<div dir="rtl">

القرار وإدارة المخاطر

</div>

  This course includes approaches to the management of risk, uncertainty and variability, quantifying uncertainty, probability assessment methods, model building and validation, use of software packages; extensions of decision analysis including stochastic and multi-attribute methods; applications to project management, scheduling, and cost estimation. Recent correlated software packages should be used through labs.

DS 465 Multi-objective Programming :

<div dir="rtl">

البرمجة متعددة الأهداف

</div>

  This course includes concepts of both the linear and nonlinear multi-objective programming: Utility theory. Different scalarization techniques (weighting approach…). Value theory. Goal programming methods. Interactive multi-objective programming methods. Parametric approaches for multi-objective programming. Applications and usage of software packages are stressed throughout the course. Recent correlated software packages should be used through labs.

DS 470 Computational Intelligence in Operations Research and Decision Support:

الذكاء الحسابى في بحوث العمليات ودعم إتخاذ القرار

This course will cover the three main components of computational intelligence: namely evolutionary, fuzzy, neural computation. An emphasis will be made on the application of computational intelligence (CI) techniques to optimization, prediction and modeling. Related heuristics techniques such as Ant Algorithms, genetic algorithms, neural networks, tabu search, simulated annealing may also be covered. The advantages and limitations as well as the guidelines for selecting the most efficient approach for various types of problems will be addressed. The implementation of CI techniques for various problems will be stressed throughout the course. Recent correlated software packages should be used through labs.

DS 450 Project :

المشروع

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department and analyze the underlying problem. In the second semester the design and implementation of the project will be conducted.

DS 500 Computer Simulation Techniques

تقنيات الحاسب للمحاكاة

This course includes basic simulation modeling, nature of simulation, system models and simulation, discrete event simulation, simulation of single-server queuing system, simulation of an inventory system, list processing in simulation, simulation language, simulation of time sharing systems, simulation output data and stochastic processes, building valid and credible simulation models, principles of valid simulation modeling, verification of simulation modeling computer programs, an approach for developing valid & credible simulation output data, output data analysis for a single system. Recent correlated software packages should be used through labs.

DS 501: Scheduling Techniques

تقنيات الجدولة

This course focuses on developing effective project schedules. Proven techniques are applied to each of the following: work breakdown structure creation, realistic estimate development, functional dependency definition, task constraint management, resource assignment, schedule optimization. Create a model of a project using Microsoft project set up project options and calendars, configure the Microsoft project database to effectively process tasks, estimates, dependencies, constraints, deadlines, resources, and assignments , optimize the schedule to meet deadlines and budget restrictions , balance resource workloads through the application of advanced resource-driven scheduling techniques , create project state reports and custom project views, manage baselines and update project actual , crash or fast-track a project schedule. Recent correlated software packages should be used through labs.

DS 502 Decisions and Game Theory:

نظرية المباريات والقرارات

This course includes basic concepts of decision making under certainty, risk and uncertainty. The use of decision tables, decision trees and sequential decision-making, opportunity loss, one-time decisions and expected value of information. Conditional probability and decision analysis. Multiple comparison and multiple ranking methods. Examining the many facets of game theory, such as bargaining theory, non-cooperative games, cooperative games, games with incomplete information. Several cases studies will be used to illustrate the application of decision theory to real world problems beside using commercial software package. Recent correlated software packages should be used through labs.

DS 503 Seminar in Stochastic Operation Research:

<div dir="rtl">

مقاله فى بحوث العمليات العشوائيه

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In this course the students will be grouped in teams .Each one is responsible for preparing a technical report handling the stochastic tools in operations research. These technical reports are discussed and evaluated by the instructor. Recent correlated software packages should be used through labs.

DS 551Computational Intelligence application in Operation Research:

<div dir="rtl">

الذكاء الحسابى في بحوث العمليات ودعم إتخاذ القرار

</div>

This course will cover the three main components of computational intelligence: namely evolutionary, fuzzy, neural computation. An emphasis will be made on the application of computational intelligence (CI) techniques to optimization, prediction and modeling, related heuristics techniques such as ant algorithms, genetic algorithms, neural networks, tabu search, simulated annealing may also be covered. The advantages and limitations as well as the guidelines for selecting the most efficient approach for various types of problems will be addressed. The implementation of CI techniques for various problems will be stressed throughout the course. Recent correlated software packages should be used through labs.

DS 552 Computer Application in Operations Research and Decision Support Systems

<div dir="rtl">

تطبيقات الحاسب فى بحوث العمليات وإتخاذ القرار:

</div>

This course will cover approaches and techniques to construct and implement effective computer-based decision support systems (DSS). Also cover alternative software development tools or generators of a DSS. The role of computational tools (simulation, optimization, statistical and other quantitative models) and computer information systems (management information system, artificial intelligence and expert system) to support and enhance the capability of the DSS. Discussion and analysis of real life case studies of integrated DSS is stressed throughout the course. Recent correlated software packages should be used through labs.

DS 553 Strategic, Risk, and Crisis Management:

<div dir="rtl">

الإدارة الإستراتيجية, إدارة المخاطر, وإدارة الأزمات

</div>

This course includes draws from all functional areas of an enterprise to provide strategic directions to an organization. Strategies are offered to ensure success on a competitive" for profit" environment. A framework is developed to understand the interrelation of accounting, finance, operation, engineering, and marketing. Concepts and fundamentals of crises and risk management, resolving crises, and types of crises and risk are introduced. Applications and

use of software packages are stressed throughout the course. Recent correlated software packages should be used through labs.

DS 554 Linear and Nonlinear Modeling:

<div dir="rtl">النمذجة الخطية وغير الخطية</div>

Introduction to the most commonly used model in statistical data analysis, simple linear regression, multiple regression, and analysis of variance are covered, as well as statistical model-building strategies, regression diagnostics, analysis of complex data sets and scientific writing skills are emphasized, computations will use a statistical software package such as STATA or SPSS. And nonlinear predictive control (NMPC) and over the past decade significant theoretical as well as implementation advances in the area of NMPC have been achieved. Recent correlated software packages should be used through labs.

DS 550 Project

<div dir="rtl">المشروع</div>

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted.

DS 510 Risk Assessments, Analysis and Evaluation:

تقييم المخاطر, وتحليلها

This course will help you in: critically review probabilistic risk assessments, distinguish variability and uncertainty, particularly in the context of risk management, evaluate the impacts of choices made to characterize information from data and experts, explore the use of Bayesian methods in risk assessments, and communicate probabilistic risk assessment results, and will contain developing probabilistic models, a guided tour of probability distributions, developing distributions from data and from expert elicitation value of information analysis, using the results of probabilistic risk assessment in risk management, communicating uncertain and variable risks. Recent correlated software packages should be used through labs.

DS 511 Risk Treatment: Risk Control:

مقاومة المخاطر والتعامل معها

The course will examine various methods of control and treatment of organizational risk, which has been identified, analyzed and assessed using a comprehensive risk management framework. Various control and treatment options for major categories of risk will include applied techniques in loss prevention, loss reduction, risk transfer and risk financing, including the application of commercial insurance and self-insurance methods. Recent correlated software packages should be used through labs.

DS 512 Occupational Safeties and Health:

الصحة والسلامة المهنية

This course will cover an analysis of issues and problems associated with occupational health and safety. Topics will be examined from social, political, economic, legal and medical perspectives. Recent correlated software packages should be used through labs.

DS 513 Quantitative Risks and Modeling:

النمذجة والمخاطر الكمية

The course will cover techniques for: identifying hazards, quantifying the frequency and consequences of potential accidents, calculating risk, you will review basic analysis principles and concepts and then common techniques for hazard evaluation, frequency assessment, consequence assessment, and risk evaluation. Recent correlated software packages should be used through labs.

DS 561 Risk Technology Strategies:

تقنيات وخطط المخاطر

This course' content is historical development of standards and codes of practice and their applications, use of design principles to prevent loss, risk management simulations and applications, application of standards and codes, development of skills and techniques to

identify and control particular hazards endemic to human and property loss. Recent correlated software packages should be used through labs.

DS 652 Industrial Environments and HR in Risk:

البيئات الصناعية والموارد البشرية في المخاطر

The Objectives of this course are an understanding of scientific principles concerning the field of ergonomics, be able to apply these principles in the analysis of a typical workplace environment, an understanding of the risks associated with occupational hygiene factors. Awareness of the control methods, including use of material safety data sheets. Recent correlated software packages should be used through labs.

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DS 563 Business Continuity and Crisis Management:

إستمرارية العمل وإدارة الأزمات

This course will provide a realistic understanding of business continuity management (BCM). The course explores the key principles and stages of implementing a BCM infrastructure, whilst emphasizing the background, nature, purpose and benefits of implementing BCM. The course will benefit senior managers with overall responsibility for implementing and maintaining business continuity and disaster recovery plans, as well as auditors, and staff new to the subject. Recent correlated software packages should be used through labs.

DS 564 Risk Management

إدارة المخاطر

This course includes approaches to the management of risk, uncertainty and variability, quantifying uncertainty. Probability assessment methods. Model building and validation, use of software packages; extensions of decision analysis including stochastic and multi-attribute methods; applications to project management, scheduling, and cost estimation. Recent correlated software packages should be used through labs.

DS Project

المشروع

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted.

DS 520 Introduction to Project Management

مقدمه فى إدارة المشروعات

Introduction to project management, network construction rules for activity on arc and activity on node, critical path method (CPM), bar charts and resource distribution, program evaluation and review technique (PERT), scheduling techniques simple compression, complex compression, resource leveling, heuristics in scheduling, cost analysis. Recent correlated software packages should be used through labs.

DS 521 Communication skills

مهارات الإتصال

This course introduces effective writing - planning, drafting with clarity, economy and style and editing report writing - structuring, preparing, numbering, drafting, using visuals and revising, working with numbers - adding and taking away, multiplying and dividing, percentages, persuading with numbers - understanding basic concepts, using figures, charts and graphs. preparing presentations - preparing your subject, using visual aids, final preparation, giving presentations - understanding what sort of presenter you are, tips for preparation, improving delivery skills, managing the delivery environment and giving the presentation. Recent correlated software packages should be used through labs.

DS572 Math for Project Management

الرياضيات في إدارة المشروعات

This course cover the mathematical models (liner programming, nonlinear programming, dynamic programming, branch and bound techniques,……..etc) used to verify the dependency relationships of project activities, calculating the critical paths, resource allocation, crashing techniques, scheduling techniques, heuristics. Recent correlated software packages should be used through labs.

DS 523 Projects Planning and Scheduling

تخطيط وجدولة المشروعات

The course shows how project planning might be done for a small project and also how project planning should be done for large projects. The course stresses that project planning is not about knowing how to use a planning tool, such a Microsoft project or track-it. knowing how to use a planning tool is not the same as knowing how to do project planning. Whether the project planning produces a plan that is shown as a PERT network, a gantt chart, bar chart, precedence diagram or whatever doesn't much affect how you go about the intellectual job of project planning. Recent correlated software packages should be used through labs.

DS 571 Human Relations and Behavior

سلوكيات الموارد البشريه

This course examines human relations and organizational behavior concepts, strategies, and theories from the public, business, and educational sectors and applies them to the educational realm. The key processes of conflict resolution and organizational change are explored, along with how they influence educational organizations in the areas of leadership, communication, decision making, problem solving, diversity issues and educational change. Topics and objectives include: history and theories of human relations, behavioral dynamics, decision-making models and group dynamics, organizational culture and climate, leadership, conflict resolution and problem solving, and diversity. Recent correlated software packages should be used through labs.

DS 522 Feasibility Study of Projects

دراسة الجدوى للمشروعات

This course will take the student through the process of identifying a product/service, analyzing the market and competitive position, and focus on the product/service strengths. Objectives for the course will be to define the business, what is sold, and the target market, categorize future and current customers, identify the competition and design a promotion and advertising plan. Choose a marketing strategy and assemble a feasibility study and marketing plan. Recent correlated software packages should be used through labs.

DS 573 Computer Application in Project Management

تطبيقات الحاسوب فى إدارة المشروعات

This course aims at improving the utilization of information technology in construction project management by introducing popular computer applications to construction professionals. Major topics of this course include: computer hardware fundamentals; data management and analysis tools (Microsoft Excel 2003, and Access 2003); information sharing with the Internet (Microsoft FrontPage); and Microsoft Project 2003 applications, primavera and the core differences among them. Recent correlated software packages should be used through labs.

DS 574 Project Management and Contracts

إدارة المشروعات والعقود

The course emphasizes the application of contract management and administration to equip the students for their career development. The students have the opportunity to understand project management and contracting in different industries, and to appreciate the application of such techniques in project through case studies. The students have the opportunity to perform or to undertake mini-projects to better understand the application of knowledge acquired. Recent correlated software packages should be used through labs.

DS 550 Project

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted.

DS 600 Advanced Forecasting Techniques:

تقنيات تنبؤ متقدمة

This course includes the advanced techniques of preparing sales and financial forecasts, estimate the relative error in these forecasts, hands-on approach, and transform data and information into a competitive advantage, identify major trends in cash budgeting and cash-flow planning, understand forecasting error and the impact of uncertainty participants. Software packages correlated to advanced forecasting techniques are used. Recent correlated software packages should be used through labs.

DS 601 Advanced Topics in Decision Analysis

موضوعات متقدمة في تحليل القرار

The course is intended to deepen and extend students' understanding of decision analysis, and to show how the theory can be applied. Topics covered are the theory of decisions with multiple objectives, influence diagrams and belief nets, cascaded Bayesian inference, stratified systems theory and group processes. Recent correlated software packages should be used through labs.

DS 602 Computational Intelligent Techniques in Operations Research and Decision Support

تقنيات الحسابات الذكية في بحوث العمليات ودعم إتخاذ القرار

On completion of this course you should be able to describe and discuss the nature of human decision–making be able to describe and discuss the ways in which information systems can be used to assist human decision–making, be able to discuss the role of modeling in decision support and be able to develop and use a simple model for decision assistance possess a sound knowledge of the principles underlying the design, development and use of the following :individual decision support systems , group decision support systems knowledge–based (expert) systems , executive information systems , systems for computer–supported cooperative work (CSC, (be aware of current developments and future trends concerning intelligent systems and their use. Recent correlated software packages should be used through labs.

DS 603 Crisis Management:

إدارة الأزمات

This course provides delegates with the capability to develop a crisis management plan and identify who should be represented on the crisis management team based on practice tools and techniques. Delegates learn how and when to invoke a crisis management plan and what immediate actions should be taken to ensure an effective recovery in the event of an incident or crisis. To identify issues relevant to the delegate's organization, a scenario

exercise is developed and run as part. Recent correlated software packages should be used through labs.

DS 604 Decision Theory:

نظرية القرارات

The course provides the students with a broad and comprehensive perspective on different theoretical approaches to the study of individual, group, and organizational decision making. During the course we will discuss conceptual and methodological problems related to research in decision making, as well as to the development of theories in the area of decision making. The course will be organized from micro to macro, by way of treating decision making at the level of the individual, group and organization as well as in inter organizational settings. The course also covers individual and organizational learning. Issues related specifically to leadership and decision making will also be included. Recent correlated software packages should be used through labs.

DS 605 Deterministic Operations Research

بحوث العمليات الحتمية

The aim of this course is to expose students to various advanced deterministic operations research tools and techniques. The course presents an overview of operation research modeling, and some or all of: linear programming; network analysis; integer programming; multi-objective mathematical programming; dynamic programming; inventory models; nonlinear programming; large-scale optimization systems; optimization software. Recent correlated software packages should be used through labs.

DS 606 Discrete System Simulation

محاكاة النظم المنفصلة

This course provides a basic treatment of discrete-event simulation. Proper collection and analysis of data, use of analytic techniques, verification and validation of models and the appropriate design of simulation experiments are treated extensively. Clarifies the difficult distinctions between terminating and steady-state simulation, and between within- and across-replication statistics. Contains up-to-date treatment of simulation of manufacturing and material handling systems. Recent correlated software packages should be used through labs.

DS 607 Feasibility Study:

دراسة الجدوى

This course will introduce feasibility studies versus business plans , features ,comparison, structure of a feasibility study, benefits of feasibility studies, building the study, executive summary , the purpose and scope, business idea, proof of concept, reference group, establishing credibility, analysis of factors influencing the study. Recent correlated software

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packages should be used through labs.

DS 608 Game Theory:

<div dir="rtl">

نظرية المباريات

</div>

The course should give the students knowledge about the theoretical understanding and critique of games what is a game? what are the elements that constitute a game? , the development of new theories about games and evaluate them critically, the analysis and evaluation of game concepts and the use of games with various, intentions, the specific analysis of games, as well as the understanding of different methods for analysis. Recent correlated software packages should be used through labs.

DS 609 Human Resource Management

<div dir="rtl">

إدارة الموارد البشرية

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This course educates students on the issues and challenges that will face human resources managers well into the next century. Students will already have a basic grasp of the body of human resources knowledge. This course integrates the new challenges with the development of a new body of human resources knowledge for the human resources professional, their leadership, and line management at all organizational levels. Recent correlated software packages should be used through labs.

DS 610 Integer Programming

<div dir="rtl">

البرمجة الصحيحة

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This course offer an in depth studies of the general theory and methods of integer programming and combinatorial optimization. The course should include modeling techniques, applications, algorithms, and software. Recent correlated software packages should be used through labs.

DS 611 Judgment, choice, and Decision Analysis

<div dir="rtl">

الحكمه فى إختيار وتحليل القرار

</div>

Probabilistic modeling from data to a decisive knowledge. Decision analysis: making justifiable, defensible decisions, elements of decision analysis models, decision making under pure uncertainty, limitations of decision making under pure uncertainty, coping with uncertainties, decision making under risk, the discovery and management of losses.
Risk, the four letters word, decision's factors-prioritization and stability analysis, optimal decision making process. Recent correlated software packages should be used through labs.

DS 612 Linear Programming

<div dir="rtl">

البرمجة الخطية

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This course contain basic definitions and geometry of linear programming, applications from control, signal processing, VLSI design, communications, structural optimization, duality, the simplex method, interior-point methods, large-scale linear programming, introduction to integer linear programming. Recent correlated software packages should be used through labs.

DS 613 Management and Organization Structures

<div dir="rtl">

الهياكل التنظيميه والإداره

</div>

The objective of this course is to use a variety of works of narrative as a basis for the discussion of issues of interest to managers. By narrative, i mean works, either fiction or non-fiction, that tell stories that appeal to both the mind and the emotions. These works were not necessarily written for students of management, yet they do provide valuable insights into management skills, organizational diagnosis, ethical choices, leadership, and the impact of factors such as gender, race, ethnicity, and social class on managers. In addition, we can learn from the literary and/or cinematic techniques used to present narratives. Recent correlated software packages should be used through labs.

DS 614 Military Operations Research

<div dir="rtl">

بحوث العمليات العسكرية

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This course prepares students for research and professional practice associated with the formulation, analysis, and computer implementation of mathematical models of operational systems. Major components of the course include mathematical programming, queuing and network theories, computer simulation and modeling, applied and computational probability, and the application of these to realistic problems. Students are expected to become proficient in these areas, as well as in supporting areas of information technology necessary to implement operation research analysis approaches. Recent correlated software packages should be used through labs.

DS 615 Modeling Techniques:

<div dir="rtl">

تقنيات النمذجة

</div>

The course surveys literature on spatially disaggregated (fine-scale) empirical models of land-use change (LUC). The course will begin with a discussion of factors that are hypothesized to drive land-use change across multiple spatial, institutional, and human scales and a discussion of issues related to LUCC modeling. The bulk of the course will be spent reviewing techniques for land-use modeling, including statistical and regression models, cellular automata, mathematical programming and other optimization models, students should be able to critically review and interpret a land-use model, whether presented in a report or scholarly

article. They should have an understanding of the input data requirements, the ways in which the model output can be used, the spatial, temporal, and human scale over which the model operates, the disciplinary scope of the model, and the strengths, weaknesses, what empirical modeling techniques can be applied to a given data set. Finally, they should have an understanding of what modeling techniques are appropriate for particular research questions. Recent correlated software packages should be used through labs.

DS 616 Multicriteria Decision Analysis

<div dir="rtl">

تحليل قرار المعايير المتعددة

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This course introduces general introduction on mathematical programming and multicriteria analysis , non-linear programming and kuhn-tucker conditions, linear programming including the simplex method and sensitivity analysis , dynamic programming , decision analysis under certainty, introduction to multicriteria decision making , ordinal decision techniques , weighing methods, decision analysis under uncertainty , decision structures (diagrams and decision trees), subjective probability, value of information, use of software for decision analysis . Recent correlated software packages should be used through labs.

DS 617 Network Modeling

<div dir="rtl">

نمذجة الشبكات

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This course will cover an introductory course that establishes terminology and basic notions about graphs, discusses some examples of network models, and provides some orientation regarding linear network optimization algorithms, an extensive treatment of shortest path problems. It covers the major methods, and discusses their theoretical and practical performance, the max-flow problem and develops the class of augmenting path algorithms for its solution. A new algorithm based on auction ideas is discussed, the minimum cost flow problem (linear cost, single commodity, no side constraints). Subsequently, the basic duality theory for the problem is developed and interpreted, simplex methods for the minimum cost flow problem. The basic results regarding integrality of solutions are developed here constructively, using the simplex method, dual ascent methods, including primal-dual, sequential shortest path, and relaxation methods. Recent correlated software packages should be used through labs.

DS 618 Non-linear Programming

<div dir="rtl">

البرمجه الغير خطيه

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Necessary and sufficient conditions for unconstrained and constrained optima. Topics include the duality theory, computational methods for unconstrained problems (e.g., quasi-newton algorithms), linearly constrained problems (e.g., active set methods), and nonlinearly constrained problems (e.g., successive quadratic programming, penalty, and barrier methods). Recent correlated software packages should be used through labs.

DS 619 Principles of Command , Control, Communication, and Intelligence

نظم المحاكاة للتحكم والإتصال الذكى

This course will focus on the use and characteristics of combat simulations as aids to decision-making. Principles of good analysis using combat models will provide the overall theme of the course. It will include discussion of techniques to model attrition, acquisition, movement, battlefield environment, command and control, communications, intelligence, air-to-air combat, and decision-making. The future of combat simulations will be discussed, including advanced distributed simulation (distributed interactive simulation and high-level architecture). Recent correlated software packages should be used through labs.

DS 620 Production and Inventory Systems

نظم الإنتاج والمخزون

This course introduces the planning and control of manufacturing systems. The functions of inventory, determination of order quantities and safety stocks, alternative inventory replenishment systems, item forecasting, production-inventory systems, materials requirements planning and manufacturing resource planning (MRP/MRP II), Just-in-time systems, operations scheduling, and supply chain management. Recent correlated software packages should be used through labs.

DS 621 Project Management

إدارة المشروعات

This course contains evaluation, selection and organization of technical projects. Concepts of the network-based project management methodology. Network development. Project planning, scheduling, and control. Project cost management. Resource constrained projects. A case study approach is adopted during the course. Commercial software packages will be used throughout the course. The course will also introduce some contemporary project management subject such as: e-projects, and intelligent project management. Recent correlated software packages should be used through labs.

DS 622 Quantitative Methods

الطرق الكمية

This course covers some of the quantitative methods that are used in the social sciences. Quantitative methods' may conjure up images of complex math and statistics and many students try to avoid the subject. However, it is not possible to become a social scientist without a basic knowledge of quantitative methods to analyze and present data. This course aims to address this obvious conflict, by providing a 'user-friendly' introduction to quantitative methods. The course is designed for students with little background in math; understanding ideas and concepts will be the most important thing. Recent correlated software packages should be used through labs.

DS 623 Queuing Theory

نظرية الطوابير

This course includes introduction to discrete-time and continuous-time stochastic processes, including birth-and-death processes and counting processes, stationary and stationary-increments processes, the Poisson point process and counting process, properties of the Poisson and exponential distributions, elementary queuing concepts, including Kendall's queue notation, little's formula, introduction to Markov chains, use of discrete-time markov chains to infer the stationary behavior of an M/M/n queue, brief discussion of analytical results of M/G/n and G/G/n queues. Recent correlated software packages should be used through labs.

DS 624 Reliability Analysis

المعولية

In this course, you will learn qualitative and quantitative methods for assessing the ways human performance affects the reliability of complex systems. Upon completion, you will be able to perform a human reliability analysis (HRA), which is a necessary part of any complete probabilistic risk assessment. Recent correlated software packages should be used through labs.

DS 625 Risk Management:

إدارة المخاطر

  This course includes approaches to the management of risk. Uncertainty and variability, quantifying uncertainty, probability assessment methods. Model building and validation use of software packages; extensions of decision analysis including stochastic and multi-attribute methods; applications to project management, scheduling, and cost estimation. Recent correlated software packages should be used through labs.

DS 626 Scheduling Techniques:

تقنيات الجدولة

This course focuses on developing effective project schedules. Proven techniques are applied to each of the following: work breakdown structure creation, realistic estimate development, functional dependency definition, task constraint management, resource assignment, schedule optimization, baseline creation, and variance tracking. Extensive hands-on exercises using microsoft project database for effectively process tasks, estimates, dependencies, constraints, deadlines, resources, and assignments. Optimize the schedule to meet deadlines and budget restrictions. Balance resource workloads through the application of advanced resource-driven scheduling techniques, create project state reports, manage baselines and update project actual, crash or fast-track a project schedule. Recent correlated software packages should be used through labs.

DS 627 Stochastic Operations Research

<div dir="rtl">

بحوث العمليات العشوائية

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This course will cover the following topics in the context of operations research. Some of the main stochastic models used in engineering and operations research applications: discrete-time markov chains, poisson processes, birth and death processes and other continuous markov chains, renewal reward processes. Applications: queuing, reliability, inventory, and finance. Recent correlated software packages should be used through labs.

DS 628 Stochastic Processes

<div dir="rtl">

النمذجة العشوائية

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This course introduces preliminaries to stochastic processes: case studies, markov chains, spectral theory of stationary processes, renewal theory. The course treats stochastic processes, the author has chosen to use exercises as the main means of explanation for the various topics, and the course will have a strong self-study element. Recent correlated software packages should be used through labs.

DS 629 Strategies and planning management:

<div dir="rtl">

إدارة التخطيط والإستراتيجيات

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This Course will learn how to : select the time management system best suited to your personality and job, prioritize your goals and create more time for effective decision-making , empower others by using the five key principles of delegation. Regain control by actively managing interruptions, phone calls and email. Optimize team workflow using activity networks, float and critical path analysis. Strategies in project Management will provide you with an overview of project management. You will explore the project management process, strategic issues, and project planning concepts. Also covered are techniques such as PERT, CPM, work breakdown structure, project time and cost management. Additional topics are achieving project performance objectives, project monitoring, evaluation and control, risk and opportunity management, project termination, continuous project improvement, organizational structures, disciplines for effective project management, project teams and staffing, team building and creating effective project team dynamics . Recent correlated software packages should be used through labs.

DS 630 Dynamic methods

<div dir="rtl">

الطرق الديناميكية

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This course presents a mathematical modeling framework for sequential decision processes. A decision maker is to choose a sequence of actions towards an objective goal such as to minimize expected cost. At each stage his choice of action as well as events outside of his control determines the future development of the system. The difficulty that the decision

maker faces consists of considering both present cost and anticipated future costs. Dynamic programming captures this tradeoff. In this course, we present a unified framework for formulating both deterministic and stochastic systems, over finite or infinite time horizon. We introduce the principle of optimality and the dynamic programming algorithm; address problem formulations, algorithmic procedures as well as questions of theoretical interest. Applications are presented throughout the course, including inventory policies, production control, financial decisions, scheduling, and engineering designs. Recent correlated software packages should be used through labs.

DS 631 Stochastic Programming

البرمجة العشوائية

This course introduces introduction to probability spaces, random variables and risk aversion. Probabilistic programming. Stochastic integer programming, discrete time optimization under uncertainty. The aim is to take students to the frontiers of applications of this exciting and useful field. This course will cover the basic theory of stochastic programming .The computational part of the course will focus on computations using the IBM software package. The applied part of the course will focus on applications in portfolio management, asset and liability management, risk control for banks and hedge funds and derivative traders, and other areas of interest to the students in the class. Recent correlated software packages should be used through labs.

المحتويات العلمية لمقررات مرحلة الدبلومات العامة

GDBS 500 Discrete Mathematics

الرياضيات غير المتصلة

Functions, relations and sets. Cardinality connectives. Truth tables, normal Forms. Universal proof techniques: Implications, converse, inverse, direct proof. Proof by counter example, contraposition, and contradiction mathematical Induction. Graphs and trees: Undirected graphs, directed graphs, trees, spanning trees. Goops: Basic algebra in groups, cyclic groups. Recent correlated software packages should be used through labs.

GDBS 505 Applied Statistics and Probability

الإحصاء و الإحتمالات التطبيقية

Introduction to probability, properties of probability, methods of computing probability, probability distribution, sampling & sampling distribution. Review of sampling theory and distributions, point's estimates, confidence interval estimates (for means, proportions, differences, sums, variances and variances rations). Tests of hypotheses and significance for large or small samples, operating characteristic curves, quality control chart, fitting theoretical distributions to sample frequency distributions, goodness of fit. Curve fitting, regression and correlation: method of least squares, multiple regressions, linear generalized and rank correlation, correlation and dependence. Analysis of variance students are instructed on the use of a statistics computer package at the beginning of them. Parametric classifiers, bays linear classify, linear classifier Design, clustering, parametric clustering, nonparametric clustering selection at representatives. Recent correlated software packages should be used through labs.

GDIS 500 Computer Skills for Personal Productivity

مهارات الكمبيوتر للإنتاجية

This course covers basic computer tools for personal productivity beyond an introductory level. Topics include computer files, word processing, spreadsheets, databases, presentation software, and accessing electronic information. The objective is to prepare a student for the International Computer Driving License (ICDL) Examination. Recent correlated software packages should be used through labs.

GDIS 505 Fundamentals Of Information Systems

أساسيات نظم المعلومات

Fundamental concepts, objective of information system, system definition, subsystem definition, message passing in information system, message levels data, information, knowledge, needs, characteristics, sources, data processing (DP), electronic data processing (EDP), management information system (MIS),

economics of information systems, decision support system (DSS), office automation system (OAS), executive information system (IS), expert system (ES), computer based information system (CBIS), type of CBIS, relationships among CBISs, the evolutionary view, the hierarchical view, the contingency view, the importance of CBIS, the nature of information system in different organization. Management concepts in CBIS, data management, the organization of data, application oriented files, database approach, decision-making concepts and tools, decision support system (DSS), building a DSS, application of DSS, evaluation of information systems. Recent correlated software packages should be used through labs.

GDIT 500 Digital Logic Design

التصميم المنطقي

Numbering systems, logic functions and logic gates. Boolean algebra. Combinational circuits: Simplification of logic circuits using Karnaugh maps and tabulation method. Gate level design, adders, subtracters, encoders and decoders, multiplexers and demultiplexers. MSI Design, Programmable devices (ROM, PAL, PLA,....).Sequential circuits: Flip-flops, latches, analysis and design of simple sequential circuits, state tables and state diagrams, counters, registers, RAMs. Integrated circuits and logic families. Recent correlated software packages should be used through labs.

GDCS 500 Structured Programming

البرمجة الهيكلية

Basic programming in structured languages such as C++. Essential concepts, programming style, data types, identifiers, constants, variables, program structure, scoping, binding, input, output, I/O formatting, text processing, arithmetic operations, assignment operators, Boolean operators, logical operators, standard functions. conditionals -- selection, single-branch conditionals, double-branch conditionals, multiple-branch (switch or case) conditionals, loops -- iteration, pretest loops, posttest loops, fixed repetition loops, nested loops, immediate loop termination, skipping specific loop iterations, functions -- motivation for using functions, function parameters, return values, function prototypes, functions with no return value, parameter less functions, call by value, call by reference, default parameter values, recursion, function overloading, arrays -- indexed data structures, one-dimensional arrays, character strings, array and loop relationships, array and function relationships, array searching algorithms, array sorting algorithms, recursive array manipulation, Arrays -- two-dimensional arrays, two-dimensional arrays and nested loops, two-dimensional arrays and functions, processing rows of two-dimensional arrays as one-dimensional arrays, multi-dimensional arrays, pointers -- physical memory addresses, defining and initializing pointers, de-referencing pointers, static pointers, dynamic pointers, pointer and array relationship, arrays of pointers, pointers as function parameters, dynamic array sizing, structures -- data aggregates containing data of multiple types, using structure variables, structure arrays, pointers to structures, nested structures, structures as function parameters, structure member functions, overloading structure functions. Recent correlated software packages should be used through labs.

GDCS 505 Artificial Intelligence

الذكاء الإصطناعي

This is an introductory AI course. Topics will include Artificial and human intelligence, overview of Artificial Intelligence, basic problem-solving strategies, heuristic search, problem reduction and AND/OR graphs, domains of AI- symbolic processing: semantic nets, modeling model based reasoning, frames. Knowledge Representation, representing knowledge with If-Then rules. Inference Engines, inference techniques: implication, forward and backward chaining, inference nets, predicate logic, quantifiers, tautology, resolution, and unification. rule based systems: inference engine, production systems, problem solving, planning, decomposition, and basic search techniques. AI languages: symbolic and coupled processing prolog: objects and relations, compound goals, backtracking, search mechanism, dynamic databases, lisp, program structure and operations, functions, unification, memory models. Fields of AI: heuristics and game plying, automated reasoning, problem solving, computational linguistics and natural language processing, computer vision, intelligent agents, robotics AI based computer systems: sequential and parallel inference machines, relation between AI and artificial neural nets, fuzzy systems. Recent correlated software packages should be used through labs.

GDIS 510 Systems Analysis and Design

تحليل وتصميم النظم

Fundamental concepts, system definition, information systems building blocks, information systems development, systems analysis, requirement discovery, data modeling and analysis, process modeling, object-oriented analysis and modeling, feasibility analysis and system proposal, System design, application architecture and modeling, database design, output design and prototyping, input design and prototyping, user interface design, object-oriented design and modeling, system construction and implementation, system operation and support. Lab works using CASE tool. Recent correlated software packages should be used through labs.

GDCS 550 Data Structures

هياكل البيانات

Specification, representation, and manipulation of basic data structures: linked lists, arrays, stacks, queues, trees, strings, symbol tables, Huffman codes, optimal search trees, pattern matching, priority queues, heaps, hash tables. Storage allocation, garbage collection, compaction, reference counts, Sorting, graphs (graph traversal, directed graphs). List and string processing languages. Analysis of algorithms. Performance evaluation involving worst case, average and expected case, and amortized analysis. Students are required to write programs in several languages such as C++, C#, Java, or Pascal. Recent correlated software packages should be used through labs.

GDCS 555 Operating Systems

<div dir="rtl">نظم التشغيل</div>

This course will provide an introduction to operating system design and implementation. The course will start with a brief historical perspective of the evolution of operating systems over the last fifty years, and then cover the major components of most operating systems. This will include: Computer system structures, Operating system structures, Process and Process management: process synchronization and mutual exclusion; two- process solution and Dekker's algorithm, semaphores (producer- consumer, readers-writer, dining philosophers, etc), Interprocess communication, Process synchronization, Deadlocks, thread management, CPU scheduling: multiprogramming and time-sharing, scheduling approaches (SJF, FIFO, round robin, etc), Memory hierarchy and management: with and without swapping, virtual memory-paging and segmentation, page replacement algorithms, implementation., Virtual memory, Secondary storage management, I/O device management , File system: interface and implementation, FS services, disk space management, directory and data structure, Protection and security, and Case studies: Linux and Windows. Recent correlated software packages should be used through labs.

GDIT 550 Computer Networks

<div dir="rtl">شبكات الحاسب</div>

The principles and practice of computer networking, with emphasis on the Internet. The structure and components of computer networks, packet switching, layered architectures, OSI 7 layer model, TCP/IP, physical layer, error control, window flow control, local area networks (Ethernet, Token Ring; FDDI), network layer, congestion control, quality of service, multicast. Recent correlated software packages should be used through labs.

GDCS 560 Object Oriented Programming

<div dir="rtl">البرمجة الشيئية</div>

This is a first programming course for Computer Science majors with a focus on object-oriented programming. The course focuses on development of skills such as program design and testing as well as the implementation of programs using a graphical IDE. Topics include theory of object-oriented design, classes, interfaces, inheritance hierarchy, correctness; abstract data types, encapsulation, formal specification with preconditions, post- conditions, and invariants, proofs of correctness; object-oriented software, Classes and Objects, Classes as Efficient Programmer-Defined Data Types, Defining a Class, Data Members, Member Functions, Constructor Functions, Default Constructor Functions, Destructor Function, Member Function Prototypes, Member Function Default Arguments, Overloaded Member Functions,, inheritance, polymorphism, overloading; single and multiple inheritance, programming by contract, sub-classing as subcontract, specification and verification. Class Scope, ``this" Pointer, Object Instantiation, Access Specifiers Private and Public, Encapsulation, Information Hiding, Private Data Members, Public Member Functions, Private Member Functions, Array of Class Objects, containership, virtual functions, friend function and class, function and class templates, stream and files. The above concepts are implemented in either Visual C++, *C#* (Windows application)or Java. Recent correlated software packages should be used through labs.

GDDS 550 Project Management

إدارة المشروعات

Introduction to project management. Network construction rules for activity on arc and activity on node. Critical path method (CPM). Bar charts and resource distribution. Program evaluation and review technique (PERT). Scheduling techniques simple compression. Complex compression. Resource leveling. Heuristics in scheduling. Cost analysis. Recent correlated software packages should be used through labs.

GDIT 555 Computer Graphics and Multimedia

نظرية الأشكال والوسائط المتعددة

This course examines one or more selected current issues in the area of image synthesis. Specific topics covered are dependent on the instructor. Potential topics include: scientific visualization, computational geometry, photo-realistic image rendering and computer animation, Organization and structure of modem multimedia systems; audio and video encoding. Quality of service concepts; Screen resolution and screen technology, video accelerator design system, raster graphics (3D- transformation), analog- to-digital conversion, video compression, mixing and displaying at 30 FPS with full color capacity. Recent correlated software packages should be used through labs.

GDIS 555 Database Management Systems

نظم إدارة قواعد البيانات

An introduction to the theory and design of database management systems. Topics covered include internals of database management systems, fundamental concepts in database theory, and database application design and development. In particular, logical design and conceptual modeling, physical database design strategies, relational data model and query languages, query optimization, transaction management and distributed databases. Lab works using ORACLE. Recent correlated software packages should be used through labs.

GDIS 565 Expert Systems and Decision Support Systems

النظم الخبيرة ونظم دعم القرار

This course is a comprehensive treatment of decision support systems (DSS) and Expert Systems (ES) as managerial support tools. This course will examine the design, development and implementation of information technology based systems that support managerial and professional work, including Communications-Driven and Group Decision Support Systems (GDSS), Data-Driven DSS, Model-Driven DSS, Document-Driven DSS, and expert systems (knowledge-based systems. It will also cover the following topics in ES: overview of AI and ES, knowledge engineering, knowledge acquisition techniques, knowledge representation techniques, reasoning techniques, and building expert systems. Also the students will learn how to use expert system shells such as EXSYS in building some ES applications. Recent correlated software packages should be used through labs.

GDCS 500 Structured Programming

<div dir="rtl">البرمجة الهيكلية</div>

This course presents both computer science theory and C-language syntax with a principle-before-implementation approach. Forouzan and Gilberg continue to present a clear organizational structure, supplemented by easy-to-follow figures, charts, and tables. Always readable, the book develops programs and functions consistently and clearly, based on the authors' extensive academic and industry experience. The first half of the book builds a firm understanding of expressions, including pointers only to the extent necessary to cover pass-by-reference and arrays. Recent correlated software packages should be used through labs.

GDIS 550 Fundamentals of Geographic Information Systems

<div dir="rtl">أساسيات نظم المعلومات الجغرافية</div>

Discusses fundamental GIS concepts and terminology, the role of GIS in spatial data management and digital mapping, the multipurpose cadastre and resource GIS, methods of data collection and input, data modelling and representation, storage and retrieval of spatial data, concepts of database systems, manipulation and analysis features of GIS. Recent correlated software packages should be used through labs.

GDIS 555 E-Commerce

<div dir="rtl">التجارة الإلكترونية</div>

This course provides the learner with an overview of the state of e-commerce today. It defines electronic commerce and discusses electronic commerce elements. An overview of business-to-consumer and business-to-business electronic commerce is given. This course also addresses issues and technologies available for companies wishing to engage in e-commerce, this course introduces Introduction to E-commerce, E-Commerce Standards, E-commerce in Enterprise, E-commerce Technology Building Blocks. Recent correlated software packages should be used through labs.

GDDS 500 Modeling and Simulation

<div dir="rtl">النمذجه والمحاكاة</div>

Basic simulation modeling, nature of simulation. system models & simulation, discrete event simulation, simulation of a single-server queuing system, simulation of an inventory system, list processing in simulation, simulation languages, simulation of time sharing systems, simulation output data and stochastic processes, building valid and credible simulation models, principles of valid simulation modeling, verification of simulation computer programs, an approach for developing valid &credible simulation models, statistical procedures for computing real-world observation & simulation output data, some practical considerations: selecting input probability distributions, random number generators, generating random variables, output data analysis for a single system. Recent correlated software packages should be used through labs.

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18 ساعة معتمدة (9 إجباري + 9 إختياري)

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
مواد اجبارية (9 ساعات)					
---	2	3	3	English	HU100
---	3	3	4	Report Writing and Presentation Skills	HU101
---	-	3	2	Human Rights and IT Ethics	HU102
المواد الاختيارية (9 ساعات)					
---	2	3	3	Organizational Behavior	HU103
---	2	3	3	Fundamental of Management	HU104
---	2	3	3	Fundamentals of Economics and Feasibility Study	HU105
---	2	3	3	Fundamental of Accounting	HU106
---	2	3	3	Communication and Negotiation Skills	HU107
---	2	3	3	Creative Thinking	HU108

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68 ساعة معتمدة (64 ساعة اجباري – 4 ساعات اختياري)
أ- المتطلبات الاجبارية   (64 ساعة معتمدة)

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
---	2	4	4	Mathematics	BS100
---	2	4	4	Electronic Physics	BS101
---	4	2	4	Computers Skills for Personal Productivity	IS100
BS100	2	3	3	Discrete Mathematics	BS102
IS100	4	2	4	Structured Programming	CS100
BS101	2	3	3	Digital Logic Design	IT100
BS100	2	3	3	Applied Probability and Statistics	BS103
BS100 BS102	2	3	3	Numerical Computing	BS200
CS100	4	2	4	Data Structures	CS200
IS100	2	3	3	Fundamentals of IS	IS200
IT100	2	3	3	Computer Architecture	IT200
CS100	4	2	4	Object Oriented Programming	CS201
CS200 IS200	3	3	4	Database Concepts	IS201
IT200	2	3	3	Operating Systems	CS300
BS102	3	3	4	Artificial Intelligence	CS301
CS100	3	3	4	Computer Graphics	IT300
IS200	2	3	3	Systems Analysis and Design	IS300
CS300	3	3	4	Computer Networks	IT301

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المتطلبات الاختيارية للكلية (CCI Elective)
بـ 4 ساعات معتمدة

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
CS200	3	3	4	Analysis and Design of Algorithms	CS400
IS200	3	3	4	Principles of GIS	IS301
IT100	3	3	4	Digital Signal Processing	IT400
BS103	3	3	4	Operations Research	DS400
CS300	3	3	4	Internet Technologies and Programming	IT401
IS201	3	3	4	Database Management Systems	IS400

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48 ساعة معتمدة (30 ساعة اجباري + 18 ساعة اختياري)
أـ المتطلبات الاجبارية (30 ساعة معتمدة)

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
HU104	2	3	3	Technology and Innovation Management	DS200
HU104	2	3	3	Project Management	DS300
IS200	2	3	3	Information Technology and Systems Management	IS302
IS302	2	3	3	Information Services and Resources Management	IS303
IS200	2	3	3	Information Systems Quality Assurance	IS304
IS200 HU105	2	3	3	Information Technology and Systems Economics	IS401
IS300	2	3	3	Business Process Engineering	IS402
IS302	2	3	3	Knowledge Management Systems	IS403
---	6	3	6	Project	ITM400

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ب- المقررات الاختيارية للتخصص (IMT Elective)
18 ساعة معتمدة

اـ تخصص قواعد البيانات   **Database Track**

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
Database Track					**تخصص قواعد البيانات**
IS400	2	3	3	Distributed and Mobile Database	IS404
IS400 CS301	2	3	3	Data Mining and Knowledge Discovery	IS405
IS400	2	3	3	Multimedia Database	IS406
IS400	2	3	3	Database Administration	IS407
IS300	2	3	3	Object Oriented System Analysis and Design	IS408
IS400 IS408	2	3	3	Object Oriented Database	IS409
IS400	2	3	3	Information Retrieval	IS410
IS400	2	3	3	Information and Database System Security	IS411
IS400 BS102	2	3	3	Information Risk Assessment and Security Management	IS412

2ـ تخصص التجارة الاليكترونية   **E-Commerce Track**

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
E-Commerce Track				**تخصص التجارة الاليكترونية**	
IT401	2	3	3	Information Systems: An E-Commerce Introduction	IS413
IT401	2	3	3	Web Technology: Servers and Software	IS414
IT401	2	3	3	Web Programming	IS415
IS300	2	3	3	Object Structured Analysis and Logic Design	IS416
IS414	2	3	3	Telecommunications and Web Security	IS417
IS201	2	3	3	DBMS: Physical Design and Implementation	IS418
IS413	2	3	3	Project Management for Web Project	IS419
IS413	2	3	3	Managing Digital Firms	IS420
IS413	2	3	3	Technologies for B2B E-Commerce	IS421

3ـ تخصص نظم المعلومات الجغرافية   **GIS Track**

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
GIS Track				تخصص نظم المعلومات الجغرافية	
IS301	2	3	3	Geodatabase Design	IS422
IS301	2	3	3	Principles of RS	IS423
IS301	2	3	3	Digital Cartography and Visualization	IS424
IS301	2	3	3	Spatial Data Acquisition Techniques	IS425
IS301	2	3	3	Spatial Analysis and Modeling	IS426
IS301	2	3	3	GIS Programming and Customization	IS427
IS301	2	3	3	Web-Based GIS	IS428
IS301	2	3	3	GIS Management and Implementation	IS429
IS301	2	3	3	Spatial Decision Support Systems	IS430
IS301	2	3	3	Urban and Environmental Applications of GIS/RS	IS431
IS301	2	3	3	GIS Network Modeling	IS432

Multimedia Track   4ـ تخصص الوسائط المتعددة

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
Multimedia Track				تخصص الوسائط المتعددة	
IT400	2	2	3	Multimedia Principals	IT402
IT402	2	2	3	Virtual Reality	IT403
IT300	2	2	3	Advanced Methods of 3D Scene Visualization	IT404
CS201	2	2	3	User Interface Programming	IT405
IT400	2	2	3	Signals and Systems	IT406
CS301	2	2	3	Natural Language Processing	IT407
IT400	2	2	3	Digital Speech Processing	IT408
IT400	2	2	3	Modern Methods of Speech Processing	IT409
IT400	2	2	3	Image Processing	IT410
CS201	2	2	3	Game And Simulation Development	IT411
IT400	2	2	3	Digital Video and Audio	IT412
IT402	2	2	3	Interactive Multimedia Design	IT413

Software Development Track   5 ـ تخصص تطوير البرمجيات

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
Software Development Track				تخصص تطوير البرمجيات	
CS400	2	3	3	C# -Application Development in .NET	CS401
CS400	2	3	3	Java Programming (J2SE)	CS402
CS400	2	3	3	Agile Software Development	CS403
CS400 CS401	2	3	3	ASP .NET – Web Development	CS404
CS402	2	3	3	Enterprise Java With EJB and J2EE	CS405
CS400 CS401	2	3	3	.NET Web Services	CS406
CS401 OR CS402	2	3	3	XML- Application Development	CS407
CS301	2	3	3	Natural language Processing	CS408
CS201 IS300	2	3	3	Human Computer Interaction Design	CS409
CS200	2	3	3	Programming Language Concepts and Design	CS410
CS300	2	3	3	Computer Arabization	CS411
CS400	2	3	3	Compiler Design	CS412

Networks Track   تخصص الشبكات -6

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
Networks Track					تخصص الشبكات
IT301	2	2	3	LANS and Routing	IT415
IT301	2	2	3	Mobile Communications and Computing	IT416
IT301	2	2	3	Network Security	IT417
CS300	2	2	3	UNIX Systems Programming	IT418
IT301	2	2	3	Wide Area Network Implementation	IT419
IT415	2	2	3	Advanced Routing Principles	IT420
IT301	2	2	3	Multilayer Switched Networks	IT421
IT301	2	2	3	Network Analysis and Troubleshooting	IT422
CS300	2	2	3	Operating Systems for Network Security	IT424
IT401	2	2	3	Web Services Technologies and Applications	IT425
IT301			3	Internetwork Design	IT426
IT301	2	2	3	Network Management	IT427
IT401	2	2	3	Advanced Internet Programming	IT428
IT419	2	2	3	WANS and VLAN	IT429

7 - تخصص إدارة الأزمات والمخاطر   Crisis and Risk Management

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
Crisis and Risk Management				تخصص إدارة الأزمات والمخاطر	
DS400	2	3	3	Management of Technical Organizations	DS401
DS400	2	3	3	Case Studies of Crises and Disasters	DS402
DS400	2	3	3	Information Technology in Crisis and Emergency Management	DS403
DS400	2	3	3	Management of Risk and Vulnerability for Natural and Technological Hazards	DS404
DS400	2	3	3	Current Issues in Emergency and Crisis Management	DS405
DS400	2	3	3	Terrorism Preparedness, Critical Infrastructure and Emergency Management	DS406
DS400	2	3	3	Crisis Management, Disaster Recovery and Organizational Continuity	DS407
DS400	2	3	3	Environmental Hazard Management	DS408
DS400	2	3	3	International Impacts of Disasters	DS409
DS400	2	3	3	Disaster Mitigation and Recovery	DS410

8- تخصص دعم القرار   **Decision Support Track**

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
Decision Support Track					**تخصص دعم القرار**
DS400	2	3	3	Computer Simulation Technique	DS411
DS400	2	3	3	Decision and Game Theory	DS412
DS400	2	3	3	Stochastic Models in Operations Research and Decision Support	DS413
DS400	2	3	3	Inventory Control and Production Management	DS414
DS400	2	3	3	Multi-objective Programming	DS415
DS400	2	3	3	Decision and Risk Management	DS416
DS400	2	3	3	Expert Systems and Decision Support Systems	IS433
DS400	2	3	3	Computational Intelligence Application in Operation Research	DS417
DS400	2	3	3	Forecasting Techniques	DS418
DS400	2	3	3	Advanced Project Management	DS419

9ـ تخصص إدارة المشروعات **Project Management Track**

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
Project Management Track				تخصص إدارة المشروعات	
DS400	2	3	3	Human Resource Management	DS420
DS400	2	3	3	Quality Management	DS421
DS400	2	3	3	Management Decision Analysis	DS422
DS400	2	3	3	Production and Operations Analysis	DS423
DS400	2	3	3	Cost and Value Analysis	DS424
DS400	2	3	3	Interpersonal Skills for Virtual and Co-Located Project Teams	DS425
DS400	2	3	3	Advanced Tools and Techniques for Project Management	DS426
DS400	2	3	3	Project Procurement Management	DS427
DS400	2	3	3	Managing Multiple Projects	DS428
DS400	2	3	3	Special Topics in Project Management	DS429

HU100 English Language:

اللغة الانجليزية

 The material reflects the stylistic variety that advanced learners have to be able to deal with. The course gives practice in specific points of grammar to consolidate and extend learners existing knowledge.

HU101 Report Writing and Presentation skills

كتابة التقارير و مهارات العرض

This course introduces Basic rudiments of report writing. The rationale for report writing, the structure of reports, physical appearance and linguistic style. In addition to writing reports, students will also be given supplementary exercises, as necessary, to enhance their general writing skills. Recent correlated software packages should be used through labs.

HU102 Human Rights and IT Ethics:

حقوق الإنسان وأخلاقيات المهنة

The course is intended to provide an increased understanding of how human rights and ethical issues present themselves in discussions of population policies and programs as well as how the science of demography is affected by human rights and ethical considerations. The course will begin with a brief review of demographic processes and methods, the human rights field, and basic modes of ethical thought. After this introduction, the course will give equal attention to four largely distinct areas:(1) the human rights consequences and the ethical foundations and implications of various substantive demographic policies and programs and, related to this, the impact of human rights, or their restriction, on demographic behaviors;(2) the human rights consequences of demographic research and methods and related issues of research ethics;(3) the impact of human rights, or their restriction, on demographic research; and(4) the use of demographic research and methods in support of human rights.

HU103 Organizational Behavior

السلوك التنظيمي

Perception, learning, motivation and value; individual differences and work performance; understanding yourself; motivating yourself and others, working within groups, achieving success through goal setting, achieving high personal productivity and quality; achieving rewarding and satisfying career; communicating with people; leading and influencing others; building relationships with supervisors, co-worker and customers. Recent correlated software packages should be used through labs.

HU 104 Fundamentals of Management

<div dir="rtl">

أساسيات الإدارة

</div>

Introduction to management science, principals of organization structures and their categories, inventory models, analysis cost volume profit, objectives and methodologies of resource management, skills needed to effective management renewable and natural resources. Decision making processes and financial management, accounting management, marketing, and human resource management. Recent correlated software packages should be used through labs.

HU105 Fundamentals of Economics and Feasibility Studies

<div dir="rtl">

أساسيات الإقتصاد ودراسات الجدوى

</div>

Concepts of economics. The economic problem. Supply and demand. Theory of demand including utility theory, theory of production, theory of cost, theory of firm including pricing theory, economics of education, economic of science and technology, economics of automation including computerization. Recent correlated software packages should be used through labs.

HU106 Fundamentals of Accounting

<div dir="rtl">

مبادئ المحاسبة

</div>

This course introduces the students the fundamentals of accounting principles and practice applied to sole or single proprietorship which may be classified as service, merchandising and manufacturing businesses. It involves a study of Nature and Importance of Accounting, The accounts, Journal, and Ledger, Adjusting the accounts, Advisory Examination, Completion of the Accounting Cycle, Accounting for Merchandising Operations, Accounting Information System, Manufacturing, Cash, Third grading Examination, and Departmental Examination.

HU107 Communication and Negotiation Skills

<div dir="rtl">

مهارات التفاوض والاتصال

</div>

The goal is to become knowledgeable of the Integrated and Collaborative Engagement Process and the theory and practice of effective relationship building by developing a critical thinking process that creates an understanding of diverse constructions of reality shared by individuals and groups in any setting. Effective Business Communication, Communicating in Teams & Business Etiquette, Communicating Intercultural, Planning Business Messages, Writing Business Messages, Completing Business Messages, Writing Routine Messages, Writing Bad News Messages Writing Persuasive Messages, Planning Business Reports, Writing Business Reports, Completing Business Reports, Oral Presentations, Writing Resumes and Application Letters, Interviewing for Employment, and Negotiation Skills book

HU108 Creative Thinking

<div dir="rtl">

التفكير الابداعي

</div>

Describe nature of business, role of accounting, and accounting equation. Analyze Transaction and understand rules of debit and credit. Describe adjustment process and prepare adjusted trial balance. Describe seven basic steps of a/c cycle, prepare work sheet, and

financial statements. (This fulfills SCANS Basic Skill Competencies. Describe accounting system, objectives of internal control, and subsidiary ledgers & special journals. Describe accounting for merchandising business. Describe cash and bank reconciliation. (This fulfills SCANS Basic Skill Competencies.Describe the nature and characteristics of receivables. (This fulfills SCANS Basic Skill Competencies .Describe inventory costing methods using FIFO, LIFO, & Average Cost. Describe fixed assets and intangible assets, and compute depreciation. Describe current liabilities and contigent liabilities.

BS 100 Mathematics

الرياضيات

Limits and continuity, differentiation, trigonometric functions; applications of differentiation; integration; techniques of integration; application of integration. Indeterminate forms; Taylor's formula and improper integrals; Infinite series; Fourier series and Fourier integral; parametric curves and vectors in the plane; vectors, curves and surfaces in space; binomial theorem; partial fraction; partial differentiation. Matrices and operation; homogenizes and no homogenizes liner equation; determinants; vector spaces and sub spaces. Special functions; partial deferential equations; numerical analysis; complex variables; applications. Recent correlated software packages should be used through labs.

BS101 Electronic Physics

فيزياء الاليكترونيات

Electrical sources, electrical circuit elements, Ohm's law, Kirshoffs laws, solution of AC circuits, superposition theorem, substitution theorem, Thevenin's and Norton's theorems, compensation theorem, four-pole networks, electric power, maximum power transfer theorem, diodes, transistors, field effect transistors, operational amplifiers and their basic circuits and applications. Recent correlated software packages should be used through labs.

IS 100 Computer Skills for Personal Productivity

مهارات الكمبيوتر

This course covers basic computer tools for personal productivity beyond an introductory level. Topics include computer files, word processing, spreadsheets, databases, presentation software, and accessing electronic information. The objective is to prepare a student for the International Computer Driving License (ICDL) Examination. Recent correlated software packages should be used through labs.

BS 102 Discrete Mathematics

الرياضيات غير المتصلة

Functions, relations and sets, cardinality connectives, truth tables, normal forms, universal proof techniques: Implications, converse, inverse, direct proof, proof by counter example, contraposition, and contradiction mathematical Induction, graphs and trees: Undirected graphs, directed graphs, trees, spanning trees. Goops: Basic algebra in groups, cyclic groups. Recent correlated software packages should be used through labs.

CS 100 Structured Programming

<div dir="rtl">البرمجة الهيكلية</div>

Basic programming in structured languages such as C++. Essential concepts, programming style, Data Types, Identifiers, Constants, Variables, Program Structure, Scoping, Binding. Input, Output, I/O Formatting, Text Processing, Arithmetic Operations, Assignment Operators, Boolean Operators, Logical Operators, Standard Functions. Conditionals -- Selection, Single-Branch Conditionals, Double-Branch Conditionals, Multiple-Branch (switch or case) Conditionals. Loops -- Iteration, Pretest Loops, Posttest Loops, Fixed Repetition Loops, Nested Loops, Immediate Loop Termination, Skipping Specific Loop Iterations. Functions -- Motivation for Using Functions, Function Parameters, Return Values, Function Prototypes, Functions with no Return Value, Parameterless Functions, Call by Value, Call by Reference, Default Parameter Values, Recursion, Function Overloading. Arrays -- Indexed Data Structures, One-Dimensional Arrays, Character Strings, Array and Loop Relationships, Array and Function Relationships, Array Searching Algorithms, Array Sorting Algorithms, Recursive Array Manipulation. Arrays-- two-dimensional arrays, two-dimensional arrays and nested loops, two-dimensional arrays and functions, processing rows of two-dimensional arrays as one-dimensional arrays, multi-dimensional arrays. Pointers -- physical memory addresses, defining and initializing pointers, de-referencing pointers, static pointers, dynamic pointers, pointer and array relationship, arrays of pointers, pointers as function parameters, dynamic array sizing. structures -- data aggregates containing data of multiple types, using structure variables, structure arrays, pointers to structures, nested structures, structures as function parameters, structure member functions, overloading structure functions. Recent correlated software packages should be used through labs.

IT 100 Digital Logic Design

<div dir="rtl">التصميم المنطقي</div>

Numbering systems, logic functions and logic gates. Boolean algebra. Combinational circuits: Simplification of logic circuits using Karnaugh maps and tabulation method. Gate level design, adders, subtracters, encoders and decoders, multiplexers and demultiplexers. MSI Design, Programmable devices (ROM, PAL, PLA,....).Sequential circuits: Flip-flops, latches, analysis and design of simple sequential circuits, state tables and state diagrams, counters, registers, RAMs. Integrated circuits and logic families. Recent correlated software packages should be used through labs.

BS 103 Applied Statistics and Probability

<div dir="rtl">الإحصاء و الإحتمالات التطبيقية</div>

Introduction to probability, properties of probability, methods of computing probability, probability distribution, sampling and sampling distribution. Review of sampling theory and distributions, point's estimates, confidence interval estimates. Tests of hypotheses and significance for large or small samples, operating characteristic curves, quality control chart, fitting theoretical distributions to sample frequency distributions, goodness of fit. Curve fitting, regression and correlation. Analysis of variance Students are instructed on the use of a statistics computer package at the beginning of them. Parametric classifiers, bays linear classify, linear classifier Design, clustering, parametric clustering, nonparametric clustering selection at representatives. Recent correlated software packages should be used through labs.

BS 200 Numerical Computing

<div dir="rtl">

الحسابات الرقمية
</div>

Computational errors, floating-point computation. Root finding : bisection method, Newton's method, and secant method. Approximation theory: polynomial approximation, least squares method, interpolation, extrapolation, numerical differentiation and integration, initial value problems for ODE: method, Taylor-series methods, and Rung-Kutta methods. Numerical solutions of nonlinear systems of equations: Boundary-value problems for ODE. Numerical solutions to partial differential equations. Recent correlated software packages should be used through labs.

CS 200 Data Structures

<div dir="rtl">

هياكل البيانات
</div>

Specification, representation, and manipulation of basic data structures: linked lists, arrays, stacks, queues, trees, strings, symbol tables, Huffman codes, optimal search trees, pattern matching, priority queues, heaps, hash tables. Storage allocation, garbage collection, compaction, reference counts, Sorting, graphs (graph traversal, directed graphs). List and string processing languages. Analysis of algorithms. Performance evaluation involving worst case, average and expected case, and amortized analysis. Students are required to write programs in several languages such as C++, C#, Java, or Pascal. Recent correlated software packages should be used through labs.

IS 200 Fundamentals of Information Systems

<div dir="rtl">

أساسيات نظم المعلومات
</div>

Fundamental concepts, objective of information system, system definition, subsystem definition, message passing in information system, message levels data, information, knowledge, needs, characteristics, sources, data processing (DP), electronic data processing (EDP), management information system (MIS), economics of information systems, decision support system (DSS), office automation system (OAS), executive information system (IS), expert system (ES), computer based information system (CBIS), type of CBIS, relationships among CBISs, the evolutionary view, the hierarchical view, the contingency view, the importance of CBIS, the nature of information system in different organization. Management concepts in CBIS, data management, the organization of data, application oriented files, database approach, decision-making concepts and tools, decision support system (DSS), building a DSS, application of DSS, evaluation of information systems. Recent correlated software packages should be used through labs.

IT 200 Computer Architectures

<div dir="rtl">

معمارية الحاسب
</div>

An introduction to computer architecture. Includes a survey of computer architecture fundamentals exemplified in commercially available computer systems, including classical CPU and control unit design, register organization, primary memory organization and access, internal and external bus structures, and virtual memory schemes. Alternatives to classical machine architecture,

such as the stack machine and the associative processor, are defined and compared. Parallel processors and distributed systems are also presented, along with an analysis of their performance relative to nonparallel machines. Recent correlated software packages should be used through labs.

CS 201 Object Oriented Programming

<div dir="rtl">البرمجة الشيئية</div>

The course focuses on development of skills such as program design and testing as well as the implementation of programs using a graphical IDE. Topics include theory of object-oriented design, classes, interfaces, inheritance hierarchy, correctness; abstract data types, encapsulation, formal specification with preconditions, post- conditions, and invariants, proofs of correctness; object-oriented software, classes and objects, classes as efficient programmer-defined data types, defining a class, data members, member functions, constructor functions, default constructor functions, destructor function, member function prototypes, member function default arguments, overloaded member functions,, inheritance, polymorphism, overloading; single and multiple inheritance, programming by contract, sub-classing as subcontract, specification and verification. Class scope, ``this" pointer, object instantiation, access specifiers private and public, encapsulation, information hiding, private data members, public member functions, private member functions, array of class objects, containership, virtual functions, friend function and class, function and class templates, stream and files. The above concepts are implemented in either visual C++, C# (Windows application)or Java. Recent correlated software packages should be used through labs.

IS 201 Database Concepts

<div dir="rtl">مفاهيم قواعد البيانات</div>

File organization and record storage; heap, sorted, and index files including B-trees and disk based hashing algorithms; entity relationship model, relational model, relational languages; database normalization; implementation of heap files and indexing techniques. Other topics include database modelling, operations in the relational model, database language SQL, constraints in SQL, system aspects of SQL. Lab works using Oracle. Recent correlated software packages should be used through labs.

CS300 Operating Systems

<div dir="rtl">نظم التشغيل</div>

This course will provide an introduction to operating system design and implementation. The course will start with a brief historical perspective of the evolution of operating systems over the last fifty years, and then cover the major components of most operating systems. This will include: Computer system structures, Operating system structures, Process and Process management: process synchronization and mutual exclusion; two- process solution and Dekker's algorithm, semaphores (producer- consumer, readers-writer, dining philosophers, etc), Interprocess communication, Process synchronization, Deadlocks, thread management, CPU scheduling: multiprogramming and time-sharing, scheduling approaches (SJF, FIFO, round robin, etc), Memory hierarchy and management: with and without swapping, virtual memory-paging and segmentation, page replacement algorithms, implementation., Virtual memory, Secondary storage management, I/O device management , File system: interface and implementation, FS services, disk space management, directory and data structure, Protection

and security, and Case studies: Linux and Windows. Recent correlated software packages should be used through labs.

CS 301 Artificial Intelligence

<div dir="rtl">

الذكاء الإصطناعي

</div>

This is an introductory AI course. Topics will include Artificial and human intelligence, Overview of Artificial Intelligence, Basic Problem-Solving Strategies, Heuristic Search, Problem Reduction and AND/OR Graphs, domains of AI- symbolic processing: semantic nets, modeling model based reasoning, frames. Knowledge Representation, Representing Knowledge with If-Then Rules. Inference Engines, Inference techniques: implication, forward and backward chaining, inference nets, predicate logic, quantifiers, tautology, resolution, and unification. Rule based systems: inference engine, production systems, problem solving, planning, decomposition, and basic search techniques. AI languages: symbolic and coupled processing prolog: objects and relations, compound goals, backtracking, search mechanism, dynamic databases, lisp, program structure and operations, functions, unification, memory models. Fields of AI: heuristics and game plying, automated reasoning, problem solving, computational linguistics and natural language processing, computer vision, intelligent agents, robotics AI based computer systems: sequential and parallel inference machines, relation between AI and artificial neural nets, fuzzy systems. Recent correlated software packages should be used through labs.

IT 300 Computer Graphics

<div dir="rtl">

الرسم بالحاسب

</div>

This course examines one or more selected current issues in the area of image synthesis. Specific topics covered are dependent on the instructor. Potential topics include: scientific visualization, computational geometry, photo-realistic image rendering and computer animation. Recent correlated software packages should be used through labs.

IS 300 Systems Analysis and Design

<div dir="rtl">

تحليل وتصميم النظم

</div>

Fundamental concepts, system definition, information systems building blocks, information systems development, systems analysis, requirement discovery, data modelling and analysis, process modelling, object-oriented analysis and modelling, feasibility analysis and system proposal. Lab works using CASE tool. Recent correlated software packages should be used through labs.

IT 301 Computer Networks

<div dir="rtl">

شبكات الحاسب

</div>

The principles and practice of computer networking, with emphasis on the Internet. The structure and components of computer networks, packet switching, layered architectures, OSI 7 layer model, TCP/IP, physical layer, error control, window flow control, local area networks (Ethernet, Token Ring; FDDI), network layer, congestion control, quality of service, multicast. Recent correlated software packages should be used through labs.

CS 400 Analysis and Design of Algorithms

تحليل و تصميم الخوارزميات

An introduction to the design and analysis of algorithms. The course covers design techniques, such as dynamic programming and greedy methods, as well as fundamentals of analyzing algorithms for correctness and time and space bounds. Topics include advanced sorting and searching methods, graph algorithms and geometric algorithms, notion of an algorithm: big-O, small-O, theta and omega notations. Space and time complexities of an algorithm. Fundamental design paradigms: divide and conquer, branch and bound, backtracking, dynamic programming greedy methods, simulation. Theory of NP-completeness, notion of an intractable problem. Measures of approximation: ratio bound and relative error. Polynomial time approximation scheme. Illustrative examples: graph theory, computational geometry, optimization, numerical analysis and data processing. Other areas vary from year to year, and may include matrix manipulations, string and pattern matching, set algorithms, polynomial computations, and the fast Fourier transform. Recent correlated software packages should be used through labs.

IS 301 Principles of Geographic Information Systems

مبادئ نظم المعلومات الجغرافية

Provides an introduction to Geographic Information Systems and their applications. Emphasizes the concepts needed to use GIS effectively for manipulating, querying, analyzing, and visualizing spatial-based data. Industry-standard GIS software is used to analyze spatial patterns in social, economic and environmental data, and to generate cartographic output from the analysis. Recent correlated software packages should be used through labs

IT 400 Digital Signal Processing

معالجة الإشارات الرقمية

The course examines types of multimedia information: voice, data video facsimile, graphics, and their characterization; modeling techniques to represent multimedia information; analysis and comparative performances of different models; detection techniques for multimedia signals; specification of multimedia representation based on service requirements; and evaluation of different multimedia representations to satisfy user applications and for generating test scenarios for standardization. Recent correlated software packages should be used through labs.

DS 400 Operations Research:

بحوث العمليات

This course is an introduction to the use of quantitative methods in business decision-making. Topics include linear programming, decision making under certainty, forecasting, queuing, and inventory systems. Recent correlated software packages should be used through labs.

IT 401 Internet Technologies & Programming

<div dir="rtl">

تكنولوجيا الإنترنت و برمجتها

</div>

 The aim of this course is to teach the students the fundamental technologies and techniques for creating applications on the World Wide Web (WWW). It will consider the architecture of the Web, static techniques for providing content such as HTML and CSS, and dynamic techniques such as client and server side scripting. At the end of the course the student should be able to discuss the architecture of the Web and write static web pages. Students will also be able to create dynamic web content, in particular, content obtained from a database. Students will be aware of the need for sessions for interactive web applications and how to establish sessions. Recent correlated software packages should be used through labs.

IS 400 Database Management Systems

<div dir="rtl">

نظم إدارة قواعد البيانات

</div>

An introduction to the theory and design of database management systems. Topics covered include internals of database management systems, fundamental concepts in database theory, and database application design and development. In particular, logical design and conceptual modeling, physical database design strategies, relational data model and query languages, query optimization, transaction management and distributed databases. Lab works using ORACLE. Recent correlated software packages should be used through labs.

DS200 Technology and Innovation Management

إدارة التقنيات

This course is about the management of technology and innovation from the perspective of the general manager. Although innovation typically depends on a high level of technical know-how, it also requires the mobilization and integration of significant organizational, human and financial resources, for which management and leadership skills are essential. Central themes include (a) the management of disruptive innovations, (b) innovation capabilities and organizational context, and (c) achieving sustained organizational success through technology and innovation management.

The primary objective is to help you learn effective conceptual frameworks, methodologies and tools for managing streams of innovation throughout the organization. You will also develop understanding of the nature of innovation, how organizational and technical capabilities affect innovation, and the characteristics of successful new product development and new venture systems.

DS 300 Project Management

إدارة المشروعات

This course contains evaluation, selection and organization of technical projects. Concepts of the network-based project management methodology Network development. Project planning, scheduling, and control, Project cost management. Resource constrained projects. Commercial software packages will be used throughout the course. The course will also introduce some contemporary project management subject such as: e-projects, and intelligent project management. Recent correlated software packages should be used through labs.

IS 302 Information Technology: Strategy and Management

تقنية المعلومات (الإدارة والسياسات)

This course discusses the role of information technology in corporate strategy along with key issues in managing information technology (IT).different generic strategies are discussed along with how IT plays a part in implementing strategy .Cases and lectures are used to demonstrate how technology can be used to both gain and sustain a competitive advantage. Emphasis in the course i on how IT can contribute to organizational effectiveness. the course also covers critical issues in managing the technology function as a strategic asset .the use of IT in corporate strategy depends on an appropriate technological infrastructure and on the ability of the firm to successfully manage its technology. Recent correlated software packages should be used through labs.

IS303 Information Services and Resources Management

إدارة موارد المعلومات

Effective management of IT/IS function for competitive organizational performance. Issues and alternative solutions for managing information resources within/among organizations.

Strategic and operational plans for the function; role of outsourcing; challenges of decentralization vs. centralization; management of IT professionals. Recent correlated software packages should be used through labs.

IS401 Information Technology and System Economics

<div dir="rtl">

إقتصاديات نظم وتكنولوجيا المعلومات

</div>

This course addresses this question in two ways – through the politics of information and the economic value of information. Are the ideals of freedom and economic prosperity always compatible. What is the difference between capitalism and democracy. Do information technologies change the balance between these two fundamental institutions of our society. Are these changes for better or for worse. Who benefits from new information technologies. Are there people who have something to lose. What can you do to design IT systems so that it contributes to the political and economic foundations of a democratic society.

IS 304 Quality Assurance of Information Systems

<div dir="rtl">

تأكيد جودة نظم المعلومات

</div>

This course is about the theory and practice of software testing and quality assurance. The subject matter focuses on three broad areas:- theory of software testing . we review some of the relevant techniques and research results of software testing . the aim is to provide the student with a solid foundation form . Which to build real-world testing systems and teams. Testing in practice. We look at the process and practice of testing, including the role of tester in an iterative, incremental development project. Test automation. Test automation is essential for modern software testing. Several automation methods are discussed and a survey of tools, both commercially available ones and homegrown is performed. Recent correlated software packages should be used through labs.

IS 402 Business Process Engineering

<div dir="rtl">

هندسة إجراءات الأعمال

</div>

This course focuses on the design ,management, and implementation of IT-supported processes. The evolution of information technology and the near ubiquity of the internet give business firms the opportunity to completely redesign their business processes , to develop systems faster ,and to implement systems in entirely new ways. topics covered in this course include business process analysis and design ,implementation, change management ,and performance measurement systems relevant technologies include web-based application serve providers, workflow management systems ,and enterprise systems .students learns how to analyze a business problem ,design new business processes ,and manage the implementation process .they also gain an understanding of the technology support structure required for successful implementation of organizational and interorganizational processes. Recent correlated software packages should be used through labs.

IS 403 Knowledge Management Systems

<div dir="rtl">

إدارة نظم المعرفة

</div>

The focus of this course is a blend of theories, approaches and technologies for managerial problem solving and knowledge management. The course reviews common fallacies and pitfalls in decision making and seeks to equip students with the knowledge of managerial techniques and information technologies for effective organizational decision making. Students will be exposed to methods and technologies for leveraging intellectual capital, both at an individual and firm level. Major topics of the course include "decision traps", problems in dynamic decision making, system thinking, decision support, and technologies that facilitate knowledge sharing, knowledge management and organizational learning. Recent correlated software packages should be used through labs.

تخصص قواعد البيانات	Database Track

IS404   Distributed and Mobile Database

<div dir="rtl">قواعد البيانات الموزعة والمحمولة</div>

This course will deal with the fundamental issues in large distributed systems that are motivated by the computer networking and distribution of processors, and control. The theory, design, implementation, and performance of large systems will be discussed. Concurrency, Consistency, Integrity, Reliability, Privacy, and Security in distributed systems will be included. Advanced features of the course include research related to Mobile Data Management, Streaming databases, and Peer to Peer systems.

IS405   Data Mining and Knowledge Discovery

<div dir="rtl">استخلاص البيانات واكتشاف المعرفة</div>

The objective of this course is to understand the fundamentals of data warehousing, data mining, and decision support systems. Topics include basic data warehouse architecture, data consolidation, warehouse internals (storage and indexing materialized views and aggregate pre-computation), Online Analytical Processing (OLAP) systems, main operations of data mining, system integration issues in decision support tools, survey of existing mining and OLPA products, and success and failure stories of data mining. Recent correlated software packages should be used through labs.

IS406   Multimedia Database

<div dir="rtl">قواعد بيانات الوسائط المتعددة</div>

This course aims to provide a basic study of the development of fundamental multimedia database systems, as well as applicable technologies for developing web-based multimedia applications. The former provides a basis for understanding the basic concepts and techniques pertinent to multimedia databases. The latter provides an in-depth study of more sophisticated technologies, many of which are concerned with: (a) suitable data modeling capabilities within databases; (b) defining and manipulating multimedia data; (c) multimedia indexing and content-based retrieval techniques; (d) multimedia database architecture, and (e) extending the database system functionality for multimedia applications. In this course, we will study issues concerning both the traditional and modern database systems and technologies for multimedia data management.

IS407   Database Administration

<div dir="rtl">إدارة قواعد البيانات</div>

This course is designed for a broad audience of managers, planners, and those pursuing careers in database administration. While taking this course, you will gain a basic

understanding of database management systems and administrative practices, as well as hands-on database experience.

This course will be especially helpful to planners and managers with little technical background who wish a basic understanding of database issues as they affect critical infrastructures. The course will also provide a solid foundation for more advanced work in database programming and administration.

IS408   Object Oriented System Analysis and Design

تصميم وتحليل النظم الموجهة

This course covers object-oriented analysis and design with special emphasis on what software developers, architects and analysts need to know to successfully execute object-oriented projects. The course teaches a proven method of building software systems by using activities of domain/business modeling, system analysis, and system architecture and design. The course teaches and practices a set of skills applicable for both small (lightweight) as well as large (and more rigorous) projects. Models in the course are presented in the UML notation. The emphasis in the course is on making participants able to deliver high quality models and designs leading to implementations. The course teaches participants to build object models, to capture the structure and behaviors in the problem domain, capture requirements through use cases, and create and document architectures and designs. To produce the models, we will apply a step-by-step method that leads the participants through a set of development steps, and provides for high-integrity modeling by performing cross-checks between models, resulting in correct and consistent models. This method, which builds on the best processes for object-oriented development, will help establish a productive path from the problem domain to components and object-oriented code. The course provides numerous exercises and several case studies that enable participants to practice the learned material. Course can be followed up by mentoring, ensuring the fastest application of the analysis and design skills to the project at hand.

IS409   Object Oriented Database

قواعد البيانات الموجهة

History of data models. Semantic data models. Problems in record-oriented models. Object data model. Classes and inheritance. Methods and messages. Multiple inheritance. Object queries. Object queries languages OQL. Indexing in object databases. Processing object queries. Object transaction. Concurrency control in object databases. Security in object databases. Using the object model in advanced applications. Recent correlated software packages should be used through labs.

IS410   Information Retrieval

استرجاع المعلومات

This course aims to provide a broad view and detailed knowledge of all key topics in modern information retrieval (IR). Basic concepts such as retrieval evaluation, query languages, query operations, indexing and searching are introduced. Some advanced topics including parallel and distributed IR, and multimedia IR are discussed.

IS411   Information and Database System Security

<div dir="rtl">أمن المعلومات ونظم قواعد البيانات</div>

This course will address the issues that heavily influence today's infrastructure of information systems: database security and multidatabase systems (also known as (heterogeneous) distributed database systems). The goal of the course is to provide the students with an overview of the current state of database security concepts and techniques, and to learn and understand the basic concepts of distributed database systems. The projects give students and opportunity to experiment with commercial database systems.

IS412   Information Risk Management

<div dir="rtl">إدارة المخاطر في المعلومات</div>

This course is designed to develop knowledge and skills for security of information and information systems within organizations. It focuses on concepts and methods associated with planning, designing, implementing, managing, and auditing security at all levels and on all systems platforms, including worldwide networks. The course presents techniques for assessing risk associated with accidental and intentional breaches of security. It covers the associated issues of ethical uses of information and privacy considerations

E-Commerce Track	تخصص التجارة الاليكترونية

IS413   Information Systems: An E-Commerce Introduction

مقدمة فى التجارة الإلكترونية

This course should examine the changing role of information technology and management information systems in organizations. Role of IT and MIS as competitive tools. Examine the current and potential impact of information and information technology on all aspects of his or her position, firm, and industry systematically. Since this a graduate level course, this course will focus on it from the perspective of managers. For example, case studies describing the role of IT and MIS as competitive tools should be covered extensively. Since e-business is the next major revolution-students will be expected to understand the technology of ecommerce and the impact of ecommerce on MIS. Topics include IT systems, strategic and competitive opportunities ,databases and data warehouse, decision support systems, networks, emerging technologies , planning for IT systems ,developing IT systems, managing IT systems. With regards to e-commerce and e-business: Business to consumers e-commerce , business to business e-commerce   , The role of government in promoting e-commerce ,e-commerce payment systems and digital cash , security and privacy Issues; e-business vs. e-commerce. Recent correlated software packages should be used through labs.

IS414   Web Technology: Servers and Software

تكنولوجيا الإنترنت

Introduction client/server architecture and multi-tiered architecture as it pertains to web technology. It provides fundamentals of hardware ands software as well as middleware. The course also provides some introduction to the following topics: Telecommunication, Web Server Administration, web Server planning, HTTP, and security. Web Server Administration: understanding of what is required to configure a web server and keep it running. Planning of a web server - from sizing and performance issues to choosing server software an ISP**.** How the HTTP protocol works, how ASP/JSP/CGI programs execute various methods for publishing documents on a web server. Detects and fix problems and how to generate server statistics issues by analyzing server log files. Web security introduction -covers the security issues surrounding the web. Types of threats and protecting the machines and users against these threats, web client security. Recent correlated software packages should be used through labs.

IS415   Web Programming

برمجة الإنترنت

This course presents a complete immersion into web programming. HTML language is covered in this course if students have not picked it up else where. Other topics include Dynamic HTML: Scripting using JavaScript and XML; server side components such as CGI, ASP and PERL are also introduced in this course .the course focuses on building competencies in the client/server development for web sites used in the internet/intranet environments. Java is also introduced here. Recent correlated software packages should be

used through labs.

IS416   Object Structured Analysis and Logic Design

<div dir="rtl">

تحليل وتصميم منطقى للهياكل الموجهة

</div>

This course focuses on the systems development life cycle for creating web applications; the focus is on object-oriented systems analysis and design. It introduces different paradigms or developing web software, the key stages of the life cycle and identifies key deliverables for each stage .Object technology is introduced in this course and importance o object-oriented paradigm underscored. The students should be able o identify best architectural methods for any project; understand concepts such as abstraction refractory and architectural prototyping. Topics include information systems development, object oriented analysis .object-oriented design players in the systems Game, UML,use cases , class models , project management , systems analysis , requirements discovery , data and process modeling feasibility analysis, systems design application architecture ,output design and prototyping , input design and prototyping user interface design. Recent correlated software packages should be used through labs.

IS417   Telecommunications and Web Security

<div dir="rtl">

نظم الإتصالات وأمان الشبكات

</div>

This course provides networking knowledge needed to succeed in the Web environment. Topics can range from networking topology to networking media, network standards to Ethernet, optimization to streaming media, web protocols to DSL access. Advanced web security concepts need to be covered in this course as well such   as intrusion detection and recovery, viruses, firewalls, encryption, PGP. From the e-business perspective topics covered include Electronic Payment mechanisms (and security of transaction), client-side security ,web document security, server side security, securing electronic commerce environments, analysis of the major classes of Electronic Commerce security, and survey of new trends. Topics include network characteristics, network models, WANs, internet works, intranets, and extranets; Architecture: packet-switched networks, client/server architectures, Ethernet, network components, and more; Protocols: IP, TCP, UDP, DNS,HTTP, SMTP, MIME, FTP, MAC address, and more; Applications: mail, web services, FTP, push and pull technologies, and streaming multimedia ; connectivity: DSL, T-1/T-3, ISDN, wireless networks, and cable modem connectivity; security: Encryption, SSL, SHTTP, HTTP, SET, firewalls, snifters, proxy servers, and VPNs; Web Server Support : Web development , scripting, JavaScript, CGI,server-side APIs, and dynamic content; intrusion detection and recovery; detecting an attack and recovering from an attack; secure online transactions : Encryption; secure socket layer; certificate authororities; Access Control lists. Client side security topics: Active content attacks, browser bugs web master attacks, cookies, and SSL weakness. Recent correlated software packages should be used through labs.

IS418   DBMS: Physical Design and Implementation

<div dir="rtl">

التصميم والتطبيق الفعلى لنظم إدارة قواعد البيانات

</div>

The focus of such a course is two fold-first to introduce database concepts and to focus on data and information modeling (including systems design) and implementation within a

DBMS environment. Students also learn to use a popular DBMS system such as Oracle. Topics include Database Environment, DBMS, data models, relations model, object model (OODBMS), principles of database (relation algebra), SQL, normalization. Relational database design, implementation and support. Each student/team can be asked to design and implement a small relational data base system using Oracle. Students should be able to connect web applications to a DBMS and store and update data remotely via a web interface. Recent correlated software packages should be used through labs.

IS419   Project Management for Web Project

<div dir="rtl">

إدارة مشروعات الشبكة

</div>

Focus is on developing and implementing a business plans that works in the online community. Basic project management concepts such as project planning, organizing and control are also introduced in this project. The students learn various functional areas such: Project scope management, human resource management and communications. Topics include the topics listed above are introduced. (The Project Management Institute curriculum could be adopted.) This Project management course could be blended with a Web Marketing flavour. Students could be assigned to envision a marketing strategy and find the technology to support it, reach the clients that are right for the business, develop your plans into reality, manage the project, the team, and the client ; get to the product launch-and through the special legal issues surrounding Internet communications. Recent correlated software packages should be used through labs.

IS420   Managing Digital Firms

<div dir="rtl">

إدارة الشركات الرقمية

</div>

This course focuses on the use of both traditional and web-based information technologies to manage the firm .these technologies make possible new business models, new organizational structures ,and new management processes .topics covered in new technology infrastructure and architecture, major functional applications of IT within the firm ,new IT-based business models, enterprise systems, knowledge management ,multinational systems ,managerial decisions about technology, and new organizational forms. Recent correlated software packages should be used through labs.

IS421   Technologies for B2B E-Commerce

<div dir="rtl">

تكنولوجيات تجارة الأعمال الاليكترونية

</div>

IT strategies, process design principles and information technologies for business-to-business e-commerce. Coverage of traditional firms ' planning process to establish e-business operational ,sales and web-based marketing capabilities. Economic analysis of bundling, aggregation and digital product pricing policies , and the role of technology standards and sponsored technologies in large-scale e-commerce .industry infrastructures for e-commerce , including security ,e-payment and transient data sharing and modeling approaches. Enabling technologies in business-to-business contexts. Financial justification of e-commerce and e-business technology investments. web sever and content management approaches for e-business ;development and design issues for large-scale e-commerce operations .hands on experience with e-commerce software development tools . Recent correlated software packages should be used through labs.

GIS Track	تخصص نظم المعلومات الجغرافية

IS422 Geodatabase Design

تصميم قواعد البيانات الجغرافية

The goal of this course is to introduce the main features of spatial databases, the kernel of Geographic Information Systems (GIS). Topics include: spatial concepts and data models, spatial query languages, spatial storage and indexing, query processing and optimization, spatial networks, introduction to spatial data mining. Exercises and practical work will be concentrated on building and designing geodatabases. Recent correlated software packages should be used through labs.

IS423 Principles of RS

مبادئ الإستشعار عن بعد

Basic principles of photogrammetry: stereoscopy, camera geometry. Aerial photography: cameras, calibration, flight planning. Introduction to analytical plotting methods and orientation procedures. Physical bases of remote sensing: electromagnetic radiation; basic laws of electromagnetic radiation; absorption, reflection and emission; atmospheric effects; radiation interactions with the surface; spatial resolution; temporal resolution. Trends in remote sensing: major satellite remote sensing programmes; operational systems; funding sources; commercialisation; science and applications development. Recent correlated software packages should be used through labs.

IS424 Digital Cartography and Visualization

الكارتوجرافيا الرقمية والتجسيد المرئى

An overview of the development of Cartography, the concepts, processes, techniques and data sources. The role of Cartography in digital mapping and Geographic Information Systems. Rules of graphical communication and the depiction of spatial data. The Cartographic process: need, data sources, evaluation, scale, reference base, projection, design specifications, compilation, production and final output. Graphical elements of design and symbolization. Applications of the representation of spatially referenced data in the areas of sociological, economical, topographical and environmental the traditional and digital approaches to cartographic design, production methods and user/supplier requirements. Evaluation of the cartographic processes for applicability. The functionality of digital mapping programs and the cartographic software of Geographical Information Systems. The cognitive processes of spatial data capture and the present methods of data visualization. Knowledge based map design techniques. Multimedia and virtual reality as visualization techniques. Recent correlated software packages should be used through labs.

IS425 Spatial Data Acquisition Techniques

<div dir="rtl">

تقنيات جمع البيانات الجغرافية

</div>

This course provides an introduction to surveying and mapping techniques of use to GIS professionals, including the Global Positioning System (GPS). Topics include: basic traditional survey methods, including horizontal and vertical location techniques; geodesy; data adjustments; datum and ellipsoids; coordinate systems; and transformations; understand the issues surrounding data quality; learn the difference between terms such as precision, absolute accuracy, relative accuracy, classification accuracy, temporal accuracy, and thematic accuracy. Recent correlated software packages should be used through labs.

IS426 Spatial Analysis and Modeling

<div dir="rtl">

التحليل والنمذجة باستخدام نظم المعلومات الجغرافية

</div>

This course explores methods of analyzing spatial data in the interactive and graphical environment of a GIS. The course draws on related theory in spatial statistics, geo-statistics, geographical analysis and cartographic modeling to provide a set of generic techniques for GIS users. Topics include the analysis of point patterns, networks, overlay analysis, spatial interaction models, and visualization of spatial data (virtual reality, simulation of landscape, animation, multi-media). The course concludes by considering how to extend the spatial analytical capabilities of GIS and points to the evolution of spatial decision support systems. Associated exercises and hands-on allow methods to be applied in a GIS context. Recent correlated software packages should be used through labs.

IS427 GIS Programming and Customization

<div dir="rtl">

برمجة نظم المعلومات الجغرافية

</div>

Students learn to use the Visual Basic for Applications (VBA) programming environment to add functionality to ArcGIS. Students who successfully complete the course are able to automate repetitive tasks, customize the ArcGIS interface, and share their customizations with others. Recent correlated software packages should be used through labs.

IS428 Web-Based GIS

<div dir="rtl">

نظم المعلومات الجغرافية الشبكية

</div>

Provides a conceptual overview and hands-on experiences in Internet mapping and web-based geospatial information processing with state-of-the-art commercial software. Topics covered included client/server configuration, distributed data access and display, web-based user interaction and customization. Recent correlated software packages should be used through labs.

IS429 GIS Management and Implementation

<div dir="rtl">

إدارة وتنفيذ نظم المعلومات الجغرافية

</div>

Management strategies for GIS are examined by presenting GIS as an integrated system of people, computer hardware, software, applications and data. Implementation is examined as a systematic process of user needs assessment, system specification, database design, application development, implementation, operation, and maintenance. Includes design of implementation plans as case studies to explore various techniques associated with each step of this process. Recent correlated software packages should be used through labs.

IS430 Spatial Decision Support Systems

<div dir="rtl">

نظم دعم القرارات الجغرافية

</div>

This course introduces students to key theories, concepts and techniques that have been developed recently to improve the decision support capabilities of spatial information systems. Topics covered include participatory GIS, group-based spatial decision support systems, and the integration of multi-criteria analysis (MCA) methods with GIS to facilitate decision making in planning. Recent correlated software packages should be used through labs.

IS431 Urban and Environmental Applications of GIS/RS

<div dir="rtl">

التطبيقات البيئية و المدنية لنظم المعلومات الجغرافية و الاستشعار عن بعد

</div>

This course focuses on the application of remote sensing and GIS techniques to solving real-world urban and environmental problems. Applications may include analyses of urban and suburban landscape, land use and land cover, and communication, vegetation and forestry, biodiversity and ecology, water and water quality control, soils and minerals, geology and geomorphology, etc. Recent correlated software packages should be used through labs.

IS432 GIS Network Modeling

<div dir="rtl">

نمذجة الشبكات باستخدام نظم المعلومات الجغرافية

</div>

Examines the theory of network analysis and its application in Geographic Information Systems. Topics covered include graph theoretic measures of network connectivity and proofs of network properties; optimization problems including shortest path algorithms, flow algorithms, and assignment problems on networks; special solution procedures for the classic transportation problem; procedures for linear referencing and urban travel demand modeling. The implementation of these algorithms and procedures with GIS data structures is explored using industry standard GIS software. Recent correlated software packages should be used through labs.

IT402- Multimedia Principals

مبادئ الوسائط المتعددة

Definition of multimedia technology, multimedia peripheral devices, connection between signal processing and multimedia, digital signal processors and their features, "case study" of system design with digital signal processor, Windows sound, video, and raster operation API, formats for image and sound digitization, formats for image and sound encoding, image compression, video compression, sound compression, DirectX raster operations, DirectX sound, OpenGL raster operations, multimedia programming interfaces.

IT403 -Virtual Reality

الواقع الافتراضي

Design and implementation of software systems necessary to create virtual environments; techniques for achieving real time, dynamic display of photorealistic, synthetic images; hands-on experience with electromagnetically tracked, head mounted displays. Final project requires the design and construction of a virtual environment. Recent correlated software packages should be used through labs.

IT404- Advanced Methods of 3D Scene Visualization

طرق متقدمة في تقديم المشاهد ثلاثية الأبعاد

3D scene rendering, methods of realistic rendering based on ray tracing, radiation, and their features/modifications. Particle tracing and its features, direct 3D scene rendering. Models of 3D scenes and its features, boundary representation with planar surfaces, boundary representation with general surfaces, volume models with CSG, volume raster models. Post processing of rendering methods output, OpenGL and rendering, DirectX and rendering

IT405 User Interface Programming

برمجة واجهات المستخدم

Communication between computers and humans, information throughput of the interfaces, different ways to implement the interfaces, history of user interfaces and development tools, user interfaces of the current operation systems - Windows, X-Window. and others, event controlled interfaces in detail, tools for application and user interface programming, traditional, object, and component models of the interface, elements of the user interfaces - buttons, listboxes, editboxes, etc., properties of the user interface building blocks, future development in user interface design.

IT406 Signals and Systems

الأنظمة والإشارات

Continuous and discrete time signals and systems. Spectral analysis in continuous time - Fourier series and Fourier transform. Systems with continuous time. Sampling and reconstruction. Discrete-time signals and their frequency analysis: Discrete Fourier series and Discrete-time Fourier transform. Discrete systems. Two-dimensional signals and systems. Random signals.

IT407 Natural Language Processing

<div dir="rtl">

معالجة اللغات الطبيعية

</div>

Foundations of the natural language processing, language data in corpora, levels of description: phonetics and phonology, morphology, syntax, semantics and pragmatics. Traditional vs. formal grammars: representation of morphological and syntactic structures, meaning representation. context-free grammars and their context-sensitive extensions, DCG (Definite Clause Grammars), CKY algorithm (Cocke-Kasami-Younger), chart-parsing. Problem of ambiguity. Electronic dictionaries: representation of lexical knowledge. Types of the machine readable dictionaries. Semantic representation of sentence meaning. The Compositionality Principle, composition of meaning. Semantic classification: valence frames, predicates, ontologies, transparent intensional logic (TIL) and its application to semantic analysis of sentences. Pragmatics: semantic and pragmatic nature of noun groups, discourse structure, deictic expressions, verbal and non-verbal contexts. Natural language understanding: semantic representation, inference and knowledge representations.

IT408 Digital Speech Processing

<div dir="rtl">

معالجة الأصوات الرقمية

</div>

Applications of speech processing, digital processing of speech signals, production and perception of speech, introduction to phonetics, pre-processing and basic parameters of speech, linear-predictive model, cepstrum, fundamental frequency estimation, coding (time domain and vocoders), recognition (DTW and HMM), synthesis. Software and libraries for speech processing.

IT409 Modern Methods of Speech Processing

<div dir="rtl">

طرق حديثة في معالجة الصوت

</div>

From simple systems to stochastic modeling. Hidden Markov models. Large vocabulary continuous speech recognition. Language models. Speech production, speech perception: time and frequency. Data-driven methods for feature extraction. Speech databases. Excitation in speech coding, CELP. Speaker identification.

IT410 Image Processing

<div dir="rtl">

معالجة الصور

</div>

Introduction: The human vision system, image sensors, image displays. Image Transforms: 2D-FT, Hadamard, Walsh, SVD and Karhunen Loeve transforms. Image Enhancement: Histogram modification, smoothing and sharpening by filtering techniques. Image Restoration: Correction of de-focusing and movement effects, Wiener filtering. Image Compression: Information preserving techniques, predictive and transform methods. Introduction to image analysis and computer vision

IT411 Game and Simulation Development

<div dir="rtl">

تطوير المحاكاة والألعاب

</div>

This course concentrates on the design of interactive activities in the areas of entertainment gaming, edutainment, training, and marketing. Activities will focus heavily on preproduction and game play design. Topics will include concept development, psychological aspects of gaming, game play, and technical implementation issues. Requires of class projects.

IT412 Digital Video and Audio

<div dir="rtl">

الصوت والفيديو الرقمي

</div>

Covers the use of digital technologies for video and audio in multimedia, hypermedia, and animation products. Students examine the methods for creating, sampling, and storing digital video and digital audio and the constraints placed on these media assets when used for media-based products. Emphasis is placed upon the technology of digital video and audio, including formats, data rates, compressors, and the advantages and disadvantages of the different technologies.

IT413 Interactive Multimedia Design

<div dir="rtl">

تصميم وسائط متعددة تفاعلية

</div>

This course introduces the many facets of interactive multimedia design and production. Students are introduced to authoring programs used for information delivery, with special attention focused on the integration of various media assets for communication. There is also concentration on the storage, management, and retrieval of media assets in a production environment. Considerable time is spent on the systematic design of interactive media products to meet specified goals of communication

CS401 C# -Application Development in .NET

تطبيقات لغة #C

This course will help in understand concepts. COM, COM+, and .NET, Common runtime, Metadata, API. JIT compilation, Development and debugging, Developing applications with C#, Visual Studio® .NET. The IDE for .NET, Programming with C#. Writing. Using reflection. Inheritance. Overloading. Interfaces. Dynamic method invocations, NET infrastructure. Assemblies. Building and deploying. Metadata. Versioning. Security., XML in .NET. Controlling XML format. Serialization, Windows application, ASP .NET. Session tracking. Configuring. Security. Error handling, ADO .NET (DataSets, DataReader), Manipulating data. Data display facilities. Configuration files. Tracing, Debugging, Web services. Writing clients, .NET 2.0. Language and framework features, ASP .NET 2.0. Smart clients.

CS402 Java Programming (J2SE)

البرمجة باستخدام الجافا

This course is designed to teach you how to write computer programs, using the Java programming language. The course is an introductory course where you will learn how to design and implement applets and applications. Introduction to Programming, Using Objects, Primitive Data, Writing Methods, Selection, Iteration, Debugging, Arrays, Composite Objects, Inheritance, Graphics, Applications, Streams, Java 2 Features

CS403 Agile Software Development

تطوير البرمجيات الرشيقة

Learn the secrets to developing agile software - faster, more adaptable, and more dextrous programs. In addition to looking at general design issues, participants will be introduced to UML, object modeling, and issues of planning, testing, Software development process, Object modeling and UML , Software planning, Test-driven development, Decoupling, isolation, and mock objects, Refactoring issues, Object-oriented design principles, Design patterns: Creational, structural, and behavioral, Framework specific design patterns, Agile methodologies, Agile practices to improve productivity, and Improving the development process.

CS404 ASP .NET - Web Development for Software Professionals

تطبيقات إنشاء المواقع

Learn to develop Web-based applications with high performance and scalability using Microsoft Active Server Pages, especially focus on Web-Based Programming. Concepts and protocol. Server-browser interaction, .NET and CLR. Introduction to .NET and CLR, features, benefits, and overview of VB .NET, HTTP Protocol. Methods, data transfer, queries, DHTML. DOM, CSS2, attributes, events, Netscape, and IE extensions, Scripting. Overview of VBScript, JavaScript, and document objects, ASP .NET. Server and ASP .NET, ASP vs. ASP .NET, IIS model, ASP .NET Object Model. Classes in the ASP .NET model. Using code

behind, ASP .NET Controls. Server controls and validation, server-side events, Web forms, Using VS .NET. Creating projects, development, and deployment using Visual Studio, ASP .NET Facilities. Interaction with server, tracking sessions, session objects, ASP .NET Interactions. Interacting with other pages, forwarding, including, Performance Techniques. Caching, refreshing, client pull, buffering, issues, Managing Applications. The concept of an application. Application objects, Database Access. ASP .NET and ADO .NET, database access. XML access classes, Security. Security issues and concepts, authorization techniques, SSL, ASP .NET security, XML and Web Services. XML and XSL in ASP .NET. Creating and using Web services.

CS405 Enterprise Java With EJB and J2EE

<div dir="rtl">

تطبيقات انتربريز جافا

</div>

Learn the benefits and prudent use of EJB for developing enterprise applications with high performance and scalability. Focusing on HTTP Protocol. Overview of HTTP, browser, and Web server communication, Servlets. Benefits and facilities of Servlet API, Servlet Life Cycle. Servlet creation, life cycle, and interaction with Web server, Host/Client/User Information. Obtaining information about server, client, and users, Session Management. Session tracking using cookies and session objects, JSP. The benefits of JSP and comparing it to servlets, JavaBeans. Understanding how JavaBeans help provide extensibility with servlets and how they differ from Enterprise JavaBeans, JDBC. Java's database connectivity with API, benefits, and details on database access, RMI. Java's facilities for remote method invocation and accessing remote objects, JNDI. The Java Naming and Directory Interface, benefits, facilities, and issuesEJB. Benefits of EJB. EJB 2.0 API specifications, Related Technologies. How JDBC, Servlets, JSP, RMI, and JNDI relate to EJB, Beans. Types of beans. EJB interfaces: Home interface, remote interfaceBean Environment. Understanding application servers, containers, and beans, Session and Entity Beans. Behavior, lifetime, client interaction, management, Persistence and Transactions. Container-managed versus bean-managed, Servlet/Bean Interaction. Packaging servlets with Beans. Bean-servlet interaction, Deployment Techniques. Deployment using tools and programs, Message-Driven Beans. Overview of JMS, JMSAPI, message-driven beans behavior, and interaction.

CS406 NET Web Services

<div dir="rtl">

خدمات الويب

</div>

Gain hands-on experience with development of Web Services. Learn the problems it can solve, issues that need to be considered in developing Web Services, and what is expected from a developer writing a Web Service. XML and XML Schema Definition, State of Distributed Object Computing Technologies, Limitation and Issues with Current Technologies, XML as Write Protocol: SOAP, What is a Web Service?, What is .NET? Architecture, CLR, Assemblies, Protocol for the Web Services: SOAP, UDDI, WSDL, DISCO, Writing a Web Service: Server Side Components, Using a Web Service: Client Side Components, Object Remoting Using Web Services: Object Activation, Marshaling, Security in Web Services, Architecture and Details of Classes, Interfaces, and Components, Interoperability Between .NET Web Services and Other Systems Including Java

CS407 XML- Application Development

تطوير تطبيقات XML

Participants will gain hands-on experience developing applications using XML. An introduction to XML, this course will provide insight into accessing XML documents and into various parsers and parsing techniques, XML Benefits. Overview of application development issues, XML Documents. Rules of XML, well-formed and valid documents, Parsing. Parsers for various languages, DTD. Expressing structure. Benefits and drawbacks, XML Schema. Benefits and power. Tools and techniques for generation, Modeling With XML. Designing applications for the effective use of XML, Parsing Using DOM. What is DOM? Benefits and issues of DOM, DOM API, Programming With DOM. Accessing XML documents using DOM, JavaScript, and Java. Accessing from other languages, SAX. Benefits and comparison of SAX with DOM. Using SAX API with Java, XML Namespaces. Need and benefits, creating and using namespaces, XPATH and XPointer. Expressive power of query language. Syntax and usage, XSLT. Transforming XML documents. Stylesheet generation and processing, Database Access. Generating XML documents from databases, Distributed Computing. Issues with distributed applications, SOAP. SOAP protocol, mechanism, and usage.

CS408 Natural language Processing

معالجة اللغات الطبيعية

Brief history of NLP research, current applications, generic NLP system architecture, knowledge-based versus probabilistic approaches, Finite-state techniques. Inflectional and derivational morphology, finite-state automata in NLP, finite-state transducers, Prediction and part-of-speech tagging. Corpora, simple N-grams, word prediction, stochastic tagging, evaluating system performance, Parsing and generation. Generative grammar, context-free grammars, parsing and generation with context-free grammars, weights and probabilities, Parsing with constraint-based grammars. Constraint-based grammar, unification, Compositional and lexical semantics. Simple compositional semantics in constraint-based grammar. Semantic relations, WordNet, word senses, word sense disambiguation, Discourse and dialogue. Anaphora resolution, discourse relations, Applications. Machine translation, email response, spoken dialogue systems.

CS409 Human Computer Interaction Design

التصميم التفاعلي للحاسب مع الانسان

Review of fundamental themes in User-Centered Design (UCD) and Human-Computer Interaction, Components of UCD and HCI, Human Subjects Research and Approval, Mental Models and Metaphors, Groupware and Computer-Supported Cooperative Work, User Interaction for Learning and Teaching, Technology Aspects of UCD and HCI

CS410 Programming Language Concepts and Design

تصميم لغات البرمجة

Design influences and evaluation of programming languages. Classification of programming languages, Language Translation: Interpretation, Compilation (including analysis and

synthesis phases of compilation, syntactic and semantic analysis), Bindings, binding environments, binding times, SCHEME, LISP, HASKELL or another functional language, including the notion of first class functions, Data type specification, implementation, syntax, persistence, declaration, typing systems, type equivalence, and type checking, Support for and implementation of abstract data types, encapsulation, information hiding, separate compilation, naming issues, Memory Management (the run-time stack and heap), PROLOG or another logic language, Sequence control: within expressions (arithmetic/logical expression evaluation, pattern matching and unification), between expressions (flow of control constructs) and between blocks (subroutines, exceptions, co routines, scheduled execution), including lazy vs. eager evaluation, subroutine implementation and parameter transmission, Scoping concepts, including nested scope, lexical scope and dynamic scope, Object oriented language issues: object, template, inheritance and virtual function implementation using Java, C++, or another object oriented language, Concurrency: threads, shared data, synchronization, Discussion of several imperative languages, such as Algol, Pascal, C, Fortran, Cobol, etc

CS412 Complier Design

تصميم المترجمات

The Structure of a Compiler course, Lexical Analyzer, LEX, Design of Lex, Top down Parsing, LL(1) Parsers, Bottom up Parsing, YACC, LR parsers, Syntax Directed Translation, Types and Type Checking, Run-Time Storage Administration and Symbol Table Management, Intermediate Code and Code Generation, Data-Flow Analysis, Code Optimizations, Architecture and recent development on compilers

Network Track	تخصص الشبكات

IT415-LANS and Routing

<div dir="rtl">الشبكات المحلية والتوجيه</div>

This subject provides students with knowledge of LAN hardware and physical layer standards, and basic computer networking concepts and principles, and introduces local area network (LAN) design and the use of routers and routing in autonomous system intranets. It also explains how these access WANS. `

IT416-Mobile Communications and Computing

<div dir="rtl">الاتصالات والحسابات الجواله</div>

This subject covers the development of the wireless network technology from cellular networks to IP wireless networks. The emphasis is on the concepts, infrastructure and protocols for supporting device and user mobility. The subject also focuses on the development of a simple application using Wireless Application Protocol (WAP) and Wireless Markup Language (WML).

IT417 -Network Security

<div dir="rtl">أمان الشبكات</div>

This subject consolidates students' understanding of network security by considering security principles, methodologies and technologies from a technical and management perspective. Issues such as policy-based networking, directory services, IPsec, and basic methodologies such as firewalls, proxies, encryption and authentication are dealt with.

IT418 -UNIX Systems Programming

<div dir="rtl">**برمجة نظام UNIX**</div>

This subject allows students to develop their Perl and UNIX knowledge and skills appropriate for professional practice in a UNIX environment. It also exposes students to other high-level scripting utilities. This is of general benefit and is not covered elsewhere in the course.

IT419 -Wide Area Network Implementation

<div dir="rtl">**تركيب الشبكات واسعة المدى**</div>

This subject complements and extends the theory and practice learned in the prerequisite subject. It extends skills and knowledge in WAN issues for part-time and full-time connectivity. Legacy systems, Frame relay, ISDN and POTS technologies are covered. Newer WAN technologies, wireless, IPSec VPNs, and DSL variants are introduced. Managing secure access to network devices using AAA and RADIUS servers is shown.

IT420 -Advanced Routing Principles

<div dir="rtl">**مبادئ متقدمة في التوجيه**</div>

This subject complements and extends the theory and practice learnt in the prerequisite subjects. It extends skills and knowledge in scalable interior and exterior routing protocols (OSPF, EIGRP, BGP), route optimization and redistribution, NAT and network security.

IT421 -Multilayer Switched Networks

<div dir="rtl">

الشبكات التحويلية متعددة الطبقات

</div>

Multilayer Switched Networks are now in use in a single building's LAN and extend out to Campus LANs. Performance, availability and high quality infrastructure combine to change the way businesses use computer networks. Voice, video, data and interactive traffic are now part of the traffic mix that campus LANs must handle. Multilayer switched networks must achieve, at campus level, the performance and availability requirements of business critical systems. This subject extends skills and knowledge in the design and implementation of switched campus networks using VLANs for performance, reliability and security. Traffic marking methods, protocols and techniques to ensure traffic Quality of Service (QoS) are explored at layer 2 and layer 3. Inter-VLAN routing uses layer 3 switches.

IT422 -Network Analysis and Troubleshooting

<div dir="rtl">

اصلاح وتحليل الشبكات

</div>

The subjects 32009 Advanced Routing Principles, 32010 Wide Area Network Implementation and 32011 Multi Layer Switched Networks have allowed the student to develop knowledge and skills for the design and implementation of a variety of complex internetworking scenarios. This subject consolidates approaches to analyzing and correcting internetworks that are under-performing or failing by applying sound problem-solving principles to a series of structured laboratory exercises and case studies.

IT424 -Operation Systems for Network Security

<div dir="rtl">

نظم تشغيل لامان الشبكات

</div>

This subject reviews the principles of operating systems and Network Appliance Architectures currently used in internetworking, such as UNIX, current MS 200x releases, and Cisco IOS for routers. It examines how to harden an OS against attack. It also covers threats to network appliances and hosts, especially OS vulnerabilities, e.g. buffer overflows, but also considers bugs, application vulnerabilities and network protocol weaknesses, and counters to these threats through improved OS or hardware designs, or through processes such as patching.

IT425 -Web Services Technologies and Applications

<div dir="rtl">

تطبيقات وتكنولوجيا خدمات الويب

</div>

This subject introduces students to contemporary service-oriented technologies available for building distributed applications. It introduces distributed computing programming techniques such as sockets and XML web services, and discusses further advanced topics in this field.

IT426 -Internetwork Design

<div dir="rtl">تصميم شبكة بينية</div>

This subject combines the principles studied in 32542 LANs and Routing and the prerequisite subject and extends them. These are then applied to the design of internetworks.

IT427 -Network Management

<div dir="rtl">ادارة الشبكات</div>

This subject explains the role of the network manager and the network management system. It discusses the components of network management, i.e. fault management, performance management, configuration management, security management and accounting management. The integration of these components into an enterprise management system is addressed. The lecture material is integrated with laboratory sessions throughout, allowing students to experience aspects of network management.

IT428 -Advanced Internet Programming

<div dir="rtl">برمجة الانترنت المتقدمة</div>

This subject complements and extends the knowledge covered in the prerequisite subject. It focuses on server side issues and the construction of medium- to large-scale web-based business-to-business (B2B) applications. Application servers, integration of data from multiple sources, transactions, and delivery of resultant data as XML or WAP to multiple client mechanisms are dealt with. Topics include Java Server Pages (JSP), servlets, Java Data Base Connectivity (JDBC), Java Naming and Directory Interface (JNDI) and Enterprise Java Beans (EJB). Consideration is also given to dealing with legacy systems, and RMI and CORBA are discussed.

IT429 -WANS and VLANS

<div dir="rtl">الشبكات واسعة المدى والشبكات الافتراضية</div>

This subject extends the work covered in the prerequisite subject with Virtual Local Area Networks (VLANs) and Wide Area Networks (WAN) protocols. WAN and LAN design is introduced.

Crisis and Risk Management	تخصص إدارة الأزمات والمخاطر

DS401 Management of Technical Organizations

<div dir="rtl">

إدارة المنظومات

</div>

The practice of management as applied within technical organizations. Includes history of the tradition and current effective practices, research findings, and case studies, with objectives of enhanced understanding of external and internal factors influencing organizational performance and leadership requirements.

DS402 Case Studies of Crises and Disasters

<div dir="rtl">

دراسة حالة للمخاطر والكوارث

</div>

Examines a range of different and contrasting crisis and disaster cases. Students are encouraged to investigate cases critically, paying particular attention to the aetiology of each incident, the management approaches adopted and the appropriateness of the responses to the final outcome.

DS403 Information Technology in Crisis and Emergency Management

<div dir="rtl">

تقنية المعلومات وإدارة الأزمات

</div>

The role of information in crisis and response management, determining disaster and crisis information requirements; information technologies applied to crisis, disaster and emergency management; the cause and effects of information breakdowns during crises and disasters.

DS404 Management of Risk and Vulnerability for Natural and Technological Hazards

<div dir="rtl">

إدارة المخاطر الطبيعية والغير طبيعية

</div>

Developments of concepts required for risk based planning and risk management. Objectives of and methods for vulnerability assessment for natural disaster, technological hazards, and terrorist threats. Concepts of risk analysis, risk perception, risk communication and risk mitigation.

DS405 Current Issues in Emergency and Crisis Management

<div dir="rtl">

موضوعات حديثة في إدارة المخاطر

</div>

A seminar course organized about current issues and the management successes and failures exhibited during recent disaster or crisis events. Includes presentation from federal, local, private sector and not-for-profit perspectives.

DS406 Terrorism Preparedness, Critical Infrastructure and Emergency Management
البناء الهيكلي المقاوم للمخاطر

Investigation of vulnerability and risk assessment and management associated with terrorist acts. Description of the requirements and methods of critical infrastructure protection from terrorism, technological disasters, and natural disasters. Description of national and international organizations and initiatives in this evolving area of concern.

DS407 Crisis Management, Disaster Recovery and Organizational Continuity
معالجة المخاطر واستمرارية المنظومات

Introduction to disaster recovery planning and concepts of business continuity. Recovery of information and communication systems. The role of private sector in mitigation and recovery. Public/private partnerships in community reconstruction and recovery.

DS408 Environmental Hazard Management
إدارة المخاطر البيئية

Analysis of the geological, meteorological, radiological, chemical and biological hazards facing the U.S. and international communities. Description of organizational responsibilities for hazard identification and management. Communication and perceptions of vulnerability and risk. Challenges to local governments and communities.

DS409 International Impacts of Disasters
التأثير الدولي للكوارث

Analysis of the threat from natural and technological disasters and terrorism. The description of the economic, political, and social impacts of disasters particularly on the sustainable development of lesser developed countries. The description of the international framework for disaster response and recovery and the roles and functions of international government and non government organizations.

DS410 Disaster Mitigation and Recovery
معالجة الكوارث

Investigation of existing and evolving organizations and their initiatives to improve disaster mitigation and recovery in the public and private sectors. Description of national and international organizations, their roles, coordination, successes and problems faced in accomplishing disaster mitigation and recovery operations.

DS411 Computer Simulation Technique

نظم المحاكاة بالحاسوب

Basic discrete event simulation methodology: random number generators, simulation designs, validation, analysis of simulation output. Applications to various areas of scientific modeling. Simulation language such as SLAM and GPSS. Computer assignments and projects.

DS412 Decision and Game Theory

نظرية الألعاب وصناعة القرار

This course includes basic concepts of decision making under certainty, risk and uncertainty, The use of decision tables, decision trees and sequential decision-making, opportunity loss, one-time decisions and expected value of information, conditional probability and decision analysis, multiple comparison and multiple ranking methods, examining the many facets of game theory, such as bargaining theory, non-cooperative games, cooperative games, games with incomplete information, several cases studies will be used to illustrate the application of decision theory to real world problems beside using commercial software package. Recent correlated software packages should be used through labs.

DS413 Stochastic Models in Operations Research and Decision   Support.

النماذج العشوائية في بحوث العمليات

This course covers a review of probability distributions and random variables. Markov chains, markov analysis, applications of markov chain in management science and decision support , random walk poisson process, truncated poisson process, pure birth process, pure death process, birth and death process, and their applications in operations research and decision support models. An introduction to queuing systems, single and multi-stage queuing models, queuing network models. Formulation and solution approaches of operation research models involving random variables or events, standard software packages are used as training tools in this course. Recent correlated software packages should be used through labs.

DS414 Inventory Control and Production Management

إدارة الانتاج ورقابة المخزون

This course includes introduction to a variety of production planning and inventory control problems, The development of mathematical and simulation model required to solve these problems, job-shop scheduling, work methods, maintenance and quality management topics will be covered, supply chain management, facility layout, statistical quality control, inventory management (independent and dependent inventory models), solution approaches including the use of the available operation management software packages. Recent correlated software packages should be used through labs.

DS415 Multi-objective Programming

البرمجة متعددة الأهداف

This course includes concepts of both the linear and nonlinear multi-objective programming: Utility theory. Different scalarization techniques (weighting approach…). Value theory. Goal programming methods. Interactive multi-objective programming methods. Parametric

approaches for multi-objective programming. Applications and usage of software packages are stressed throughout the course. Recent correlated software packages should be used through labs.

DS416 Decision and Risk Management

<div dir="rtl">إدارة المخاطر وصناعة القرار</div>

This course includes approaches to the management of risk, uncertainty and variability, quantifying uncertainty, probability assessment methods, model building and validation, use of software packages; extensions of decision analysis including stochastic and multi-attribute methods; applications to project management, scheduling, and cost estimation. Recent correlated software packages should be used through labs.

IS433 Expert Systems and Decision Support Systems

<div dir="rtl">النظم الخبيرة ونظم دعم القرار</div>

This course is a comprehensive treatment of decision support systems (DSS) and Expert Systems (ES) as managerial support tools. This course will examine the design, development and implementation of information technology based systems that support managerial and professional work, including Communications-Driven and Group Decision Support Systems (GDSS), Data-Driven DSS, Model-Driven DSS, Document-Driven DSS, and expert systems (knowledge-based systems. It will also cover the following topics in ES: overview of AI and ES, knowledge engineering, knowledge acquisition techniques, knowledge representation techniques, reasoning techniques, and building expert systems. Also the students will learn how to use expert system shells such as EXSYS in building some ES applications. Recent correlated software packages should be used through labs.

DS417 Computational Intelligence Application in Operation Research

<div dir="rtl">الحسابات الذكية في بحوث العمليات</div>

This course will cover the three main components of computational intelligence: namely evolutionary, fuzzy, neural computation. An emphasis will be made on the application of computational intelligence (CI) techniques to optimization, prediction and modeling. Related heuristics techniques such as Ant Algorithms, genetic algorithms, neural networks, tabu search, simulated annealing may also be covered. The advantages and limitations as well as the guidelines for selecting the most efficient approach for various types of problems will be addressed. The implementation of CI techniques for various problems will be stressed throughout the course. Recent correlated software packages should be used through labs

DS418 Forecasting Techniques

<div dir="rtl">الأساليب التنبؤية</div>

This course is designed for students who want to know how forecasts are actually developed and utilized, emphasizing modern statistical methods that are widely used to generate business forecasts. Specific applications to business include forecasting sales, production, inventory, macroeconomic factors such as interest rates and exchange rates, and other aspects of both short- and long-term business planning Topics include a statistical review, data considerations, model selection, moving averages and exponential smoothing, regression analysis, time-series decomposition, Box-Jenkins (ARIMA) models, optimal forecast combination, and forecast implementation.

DS419 Advanced Project Management

<div dir="rtl">

إدارة مشروعات متقدمة

</div>

This course includes project management body of knowledge (PMBOK) and project management systems, pricing and estimating, project risk management, managing multiple projects and enterprise project management, communication skills, effect of concurrent engineering, critical chain project management, dependency structure matrix, object oriented project management. Recent correlated software packages should be used through labs.

DS420 Human Resource Management

إدارة الموارد البشرية

An introduction to topics such as human resource planning, equal employment opportunity, selection, training and development, performance appraisal, compensation, safety and health, and employee and labor relations. The impact of laws and of societal and business trends on human resource functions is also presented. Each manager's role in dealing with human resources is emphasized

DS421 Quality Management

إدارة الجودة

Provides an understanding of the tools, language, and techniques used in the field of Total Quality Management (TQM). The history of the Quality Movement, major tenets of the field, theorists and their philosophies, and the use of basic tools of TQM will all be covered in this course. The course focus will be project-based in a team environment.

DS422 Management Decision Analysis

إدارة وتحليل القرارات

A presentation of theory and applications of quantitative decision methods used in the business setting. Topics include decision theory, linear programming, PERT/CPM, forecasting and inventory control.

DS423 Production and Operations Analysis

تحليل الانتاج والعمليات

Tools and techniques associated with planning and controlling in the production environment including forecasting, aggregate planning, master production scheduling, materials requirement planning, and shop floor control. Integrated aspects of manufacturing resource planning and enterprise resource planning as well as the effects of just-in-time management and theory of constraints.

DS424 Cost and Value Analysis

تحليل التكلفة والقيمة

Introduction to the concepts of value within the manufacturing environment. Investigation of various methods of increasing value and defining value are considered. Emphasis is on creating value for the customer through application of sound economic analysis and manufacturing methods improvements. Value Engineering including function analysis. Value Stream Mapping and 5S applications are studied in the context of Lean Manufacturing methods.

DS425 Interpersonal Skills for Virtual and Co-Located Project Teams

المهارات الشخصية وتكوين مجموعات عمل المشاريع

People issues include client satisfaction, vendor satisfaction, team morale, and communication, encompassing how team members relate to one another and affect their cohesiveness and commitment. These, in turn, affect overall performance of the project team in delivering the project results. Topics include motivation approaches, roles of the project manager, interpersonal communications tools, team member performance, managing conflict,

handling stress, and managing critical incidents. Related subjects include the linkage of people skills to the entire project life cycle; methods to handle people issues that may arise on virtual or co-located project teams; and resources available to sustain project human resource and communications needs.

DS426 Advanced Tools and Techniques for Project Management

الأدوات المتقدمة في إدارة المشروعات

A practical and tangible, yet systematic way, to plan and control projects through consistent use and application of a repository of project management tools and techniques focusing on the desirability of repeatable process. Tools and techniques include those for project initiation and portfolio management, planning, and implementation and closure, in the context of the importance of project management to the competitive strategy of the enterprise.

DS427 Project Procurement Management

إدارة متطلبات المشاريع

Typically the more complex and challenging the project, the more work will be sent outside of the organization for performance. Project Procurement Management is one of the nine project management knowledge areas in the PMBOK®. This course covers issues surrounding procurement and solicitation planning, outsourcing and partnering, solicitation development, contract administration, and contract closeout from the vantage points of both the buyer and the seller.

DS428 Managing Multiple Projects

إدارة مشروعات متعددة

Programs, and the projects and ongoing operations that make them up, are the means by which new products, services and processes are developed, operated, supported and enhanced. As a result, the ability to successfully manage programs is critical to overall performance and profitability. Topics include knowledge, skills & techniques to manage multiple projects or programs effectively within the organizational context, and the knowledge, skills, and competencies required to transition from a project manager to a program manager.

DS429 Special Topics in Project Management

موضوعات مختارة في إدارة المشروعات

Designed to present to students specialized topics in the field of Project Management depending upon interest of students and approval of staff.

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	CS	علوم الحاسب	1
	IT	تكنولوجيا المعلومات	2
	IS	نظم المعلومات	3
	DS	دعم القرار	4
	SE	هندسة البرمجيات	5
	GIS	نظم المعلومات الجغرافية	6
	EC	التجارة الإلكترونية	7

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---	3	3	3	English	HU100
HU100	3	3	4	Report Writing and Presentation Skills	HU101
---	-	3	2	Human Rights and IT Ethics	HU300
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---	2	3	3	Organizational Behavior	HU103
---	2	3	3	Fundamental of Management	HU104
---	2	3	3	Fundamentals of Economics and Feasibility Study	HU105
---	2	3	3	Group Dynamics and Communication	HU106
---	2	3	3	Communication and Negotiation Skills	HU107
---	2	3	3	Creative Thinking	HU108

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---	2	4	4	Mathematics	BS100
---	2	4	4	Electronic Physics	BS101
---	4	2	4	Programming Fundamentals	CS100
CS100	4	2	4	Object-Oriented Paradigm	CS101
BS100	2	4	4	Discrete Structure	CS102
CS100	2	3	3	IS Fundamentals	IS100
CS101	4	2	4	Data Structures and Algorithms	CS200
---	2	4	4	Operations Research	DS200
DS200	2	3	3	Project Management	DS201
CS102	2	3	3	Computer Architecture	IT200
BS100	3	3	4	Statistics and Empirical Methods for Computing	BS200
IT200	2	3	3	Operating Systems	CS300
DS200 BS200	2	4	4	Modeling and Simulation	DS300
CS102	3	3	4	Multimedia and Computer Graphics	IT300
CS102 CS200	3	3	4	Database Concepts	IS300
CS300	3	3	4	Computer Networks	IT301
CS102 CS200	3	3	4	Artificial Intelligence	CS301

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CS101	2	4	4	Introduction to Software Engineering	SE200
- - -	2	3	3	Engineering Economics	SE201
SE200	2	3	3	Software Construction	SE202
SE200	2	3	3	Software Engineering Approach to Human Computer Interaction	SE203
SE202	2	3	3	Software Design and Architecture	SE300
SE300	2	3	3	Software Quality Assurance and Testing	SE301
SE300	2	3	3	Software Requirement Analysis	SE302
SE301 SE302	2	3	3	Software Project Management	SE401
SE401	2	3	3	Professional Software Engineering Practice	SE402
- - -	8	4	8	Software Engineering Project	SE400

(Application Domain Electives)

Information system

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SE300	2	3	3	Information Systems Architecture	IS400
CS101	2	3	3	Object Oriented System Analysis and Design	IS401
SE300	2	3	3	Business Process Engineering	IS402
IS300	2	3	3	Database Management Systems	IS403
IS300	2	3	3	Object Oriented Database	IS404
IS300	2	3	3	Distributed and Mobile Database	IS405
IS300	2	3	3	Multimedia Database	IS406
SE300	2	3	3	Information Systems development Methods and methodology	IS407
SE301	2	3	3	Information Risk Assessment and Security Management	IS408
CS301 DS300	2	3	3	Expert Systems and Decision Support Systems	IS409

E-Commerce

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IT301	2	3	3	Information Systems: An E-Commerce Introduction	EC400
IT301	2	3	3	Web Technology: Servers and Software	EC401
IT301	2	3	3	Web Programming	EC402
SE300	2	3	3	Object Structured Analysis and Logic Design	EC403
IT301	2	3	3	Telecommunications and Web Security	EC404
IS300	2	3	3	DBMS: Physical Design and Implementation	EC405
IT301	2	3	3	E-Business System Strategy	EC406
SE401	2	3	3	Managing Digital Firms	EC407
IT301	2	3	3	Technologies for B2B E-Commerce	EC408

GIS

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IS100	2	3	3	Introduction to GIS	GIS400
IS300	2	3	3	Geodatabase Design	GIS401
BS201	2	3	3	Spatial Analysis and Modeling	GIS402
CS101	2	3	3	GIS Programming and Customization	GIS403
IT301	2	3	3	Web-Based GIS	GIS404
GIS400	2	3	3	GIS Management and Implementation	GIS405
GIS405	2	3	3	Spatial Decision Support Systems	GIS406
GIS405	2	3	3	Urban and Environmental Applications of GIS/RS	GIS407
GIS405	2	3	3	GIS Network Modeling	GIS408

Software Development

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CS101	2	3	3	C# -Application Development in .NET	CS400
CS101	2	3	3	Java Programming (J2SE)	CS401
SE300	2	3	3	Agile Software Development	CS402
CS101	2	3	3	ASP .NET – Web Development	CS403
CS101	2	3	3	Enterprise Java With EJB and J2EE	CS404
CS101 IT301	2	3	3	.NET Web Services	CS405
CS400	2	3	3	XML- Application Development	CS406
CS301	2	3	3	Natural language Processing	CS407
CS300	2	3	3	Computer Arabization	CS408

Networks

	/				
IT301	2	3	3	LANS and Routing	IT412
IT301	2	3	3	Mobile Communications and Computing	IT413
IT301	2	3	3	Network Security	IT414
CS300	2	3	3	UNIX Systems Programming	IT415
IT301	2	3	3	Wide Area Network Implementation	IT416
IT301	2	3	3	Multilayer Switched Networks	IT418
IT301	2	3	3	Network Analysis and Troubleshooting	IT419
IT301	2	3	3	Internetwork Design	IT420
IT301	2	3	3	Network Management	IT421

Decision Support

	/				
DS300	2	3	3	Computer Simulation Technique	DS400
DS300	2	3	3	Decision and Game Theory	DS401
DS300	2	3	3	Stochastic Models in Operations Research and Decision Support	DS402
DS300	2	3	3	Inventory Control and Production Management	DS403
DS300	2	3	3	Multi-objective Programming	DS404
DS300	2	3	3	Decision and Risk Management	DS405
DS300	2	3	3	Computational Intelligence Application in Operation Research	DS406
DS300	2	3	3	Forecasting Techniques	DS407
CS301 DS300	2	3	3	Expert Systems and Decision Support Systems	IS409

HU100 English Language:

اللغة الإنجليزية

 The material reflects the stylistic variety that advanced learners have to be able to deal with. The course gives practice in specific points of grammar to consolidate and extend learners existing knowledge.

HU101 Report Writing and Presentation skills

كتابة التقارير و مهارات العرض

This course introduces Basic rudiments of report writing. The rationale for report writing, the structure of reports, physical appearance and linguistic style. In addition to writing reports, students will also be given supplementary exercises, as necessary, to enhance their general writing skills. Recent correlated software packages should be used through labs.

HU300 Human Rights and IT Ethics:

حقوق الإنسان وأخلاقيات المهنة

The course is intended to provide an increased understanding of how human rights and ethical issues present themselves in discussions of population policies and programs as well as how the science of demography is affected by human rights and ethical considerations. The course will begin with a brief review of demographic processes and methods, the human rights field, and basic modes of ethical thought. After this introduction, the course will give equal attention to four largely distinct areas:(1) the human rights consequences and the ethical foundations and implications of various substantive demographic policies and programs and, related to this, the impact of human rights, or their restriction, on demographic behaviors;(2) the human rights consequences of demographic research and methods and related issues of research ethics;(3) the impact of human rights, or their restriction, on demographic research; and(4) the use of demographic research and methods in support of human rights.

HU103 Organizational Behavior

السلوك التنظيمي

Perception, learning, motivation and value; individual differences and work performance; understanding yourself; motivating yourself and others, working within groups, achieving success through goal setting, achieving high personal productivity and quality; achieving rewarding and satisfying career; communicating with people; leading and influencing others; building relationships with supervisors, co-worker and customers. Recent correlated software packages should be used through labs.

HU104 Fundamentals of Management

أساسيات الإدارة

Introduction to management science, principals of organization structures and their categories, inventory models, analysis cost volume profit, objectives and methodologies of resource management, skills needed to effective management renewable and natural resources.

Decision making processes and financial management, accounting management, marketing, and human resource management. Recent correlated software packages should be used through labs.

HU105 Fundamentals of Economics and Feasibility Studies

<div dir="rtl">

أساسيات الإقتصاد ودراسات الجدوى

</div>

Concepts of economics. The economic problem. Supply and demand. Theory of demand including utility theory, theory of production, theory of cost, theory of firm including pricing theory, economics of education, economic of science and technology, economics of automation including computerization. Recent correlated software packages should be used through labs.

HU106 Group Dynamics and Communication

<div dir="rtl">

ديناميكيات الاتصال

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Essentials of oral, written, and graphical communication for software engineers. Principles of technical writing; types of documents and strategies for gathering information and writing documents, including presentations. Appropriate use of tables, graphics, and references. How to be convincing and how to express rationale for one's decisions or conclusions. Basics of how to work effectively with others; notion of what motivates people; concepts of group dynamics. Principles of effective oral communication, both at the interpersonal level and when making presentations to groups. Strategies for listening, persuasion, and negotiation. The course also includes Write clear, concise, and accurate technical documents following well-defined standards for format and for including appropriate tables, figures, and references. Review written technical documentation to detect problems of various kinds. Develop and deliver a good quality formal presentation. Negotiate basic agreements with peers. Participate in interactions with others in which they are able to get their point across, and are also able to listen to and appreciate the points of others, even when they disagree, and are able to convey to others that they have listened.

HU107 Communication and Negotiation Skills

<div dir="rtl">

مهارات التفاوض والاتصال

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The goal is to become knowledgeable of the Integrated and Collaborative Engagement Process and the theory and practice of effective relationship building by developing a critical thinking process that creates an understanding of diverse constructions of reality shared by individuals and groups in any setting. Effective Business Communication, Communicating in Teams & Business Etiquette, Communicating Intercultural, Planning Business Messages, Writing Business Messages, Completing Business Messages, Writing Routine Messages, Writing Bad News Messages Writing Persuasive Messages, Planning Business Reports, Writing Business Reports, Completing Business Reports, Oral Presentations, Writing Resumes and Application Letters, Interviewing for Employment, and Negotiation Skills book

HU108 Creative Thinking

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التفكير الابداعي

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Describe nature of business, role of accounting, and accounting equation. Analyze Transaction and understand rules of debit and credit. Describe adjustment process and prepare adjusted trial balance. Describe seven basic steps of a/c cycle, prepare work sheet, and

financial statements. (This fulfills SCANS Basic Skill Competencies. Describe accounting system, objectives of internal control, and subsidiary ledgers & special journals. Describe accounting for merchandising business. Describe cash and bank reconciliation. (This fulfills SCANS Basic Skill Competencies.Describe the nature and characteristics of receivables. (This fulfills SCANS Basic Skill Competencies .Describe inventory costing methods using FIFO, LIFO, & Average Cost. Describe fixed assets and intangible assets, and compute depreciation. Describe current liabilities and contingent liabilities.

BS100 Mathematics

الرياضيات

Limits and continuity, differentiation, trigonometric functions; applications of differentiation; integration; techniques of integration; application of integration. Indeterminate forms; Taylor's formula and improper integrals; Infinite series; Fourier series and Fourier integral; parametric curves and vectors in the plane; vectors, curves and surfaces in space; binomial theorem; partial fraction; partial differentiation. Matrices and operation; homogenizes and no homogenizes liner equation; determinants; vector spaces and sub spaces. Special functions; partial deferential equations; numerical analysis; complex variables; applications. Recent correlated software packages should be used through labs.

BS101 Electronic Physics

فيزياء الاليكترونيات

Electrical sources, electrical circuit elements, Ohm's law, Kirshoffs laws, solution of AC circuits, superposition theorem, substitution theorem, Thevenin's and Norton's theorems, compensation theorem, four-pole networks, electric power, maximum power transfer theorem, diodes, transistors, field effect transistors, operational amplifiers and their basic circuits and applications. Recent correlated software packages should be used through labs.

CS100 Programming Fundamentals

أساسيات البرمجة

Introduces the fundamental concepts of procedural programming. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging. The course also offers an introduction to the historical and social context of computing and an overview of computer science as a discipline. The course also includes Fundamental programming constructs: Syntax and semantics of a higher-level language; variables, types, expressions, and assignment; simple I/O; conditional and iterative control structures; functions and parameter passing; structured decomposition. Algorithms and problem-solving: Problem-solving strategies; the role of algorithms in the problem-solving process; implementation strategies for algorithms; debugging strategies; the concept and properties of algorithms.

CS101 Object-Oriented Paradigm

البرمجة الموجهة

Introduces the concepts of object-oriented programming to students with a background in the procedural paradigm. The course begins with a review of control structures and data types with emphasis on structured data types and array processing. It then moves on to introduce the object-oriented programming paradigm, focusing on the definition and use of classes along with the fundamentals of object-oriented design. Other topics include an overview of programming language principles, simple analysis of algorithms, basic searching and sorting techniques, and an introduction to software engineering issues. The course also includes
Review of control structures, functions, and primitive data types. Object-oriented

programming: Object-oriented design; encapsulation and information hiding; separation of behavior and implementation; classes, subclasses, and inheritance; polymorphism; class hierarchies. Fundamental computing algorithms: simple searching and sorting algorithms (linear and binary search, selection and insertion sort). Fundamentals of event-driven programming; Introduction to computer graphics: Using a simple graphics API; Overview of programming languages: History of programming languages; brief survey of programming paradigms

CS102 Discrete Structures

التركيبات الغير متصلة

Introduces the foundations of discrete mathematics as they apply to computer science, focusing on providing a solid theoretical foundation for further work. Topics include functions, relations, sets, simple proof techniques, Boolean algebra, propositional logic, digital logic, elementary number theory, and the fundamentals of counting. The course also includes Introduction to logic and proofs: Direct proofs; proof by contradiction; mathematical induction. Fundamental structures: Functions (surjections, injections, inverses, composition); relations (reflexivity, symmetry, transitivity, equivalence relations); sets (Venn diagrams, complements, Cartesian products, power sets); pigeonhole principle; cardinality and countability. Boolean algebra: Boolean values; standard operations on Boolean values; de Morgan's laws. Propositional logic: Logical connectives; truth tables; normal forms (conjunctive and disjunctive); validity. Digital logic: Logic gates, flip-flops, counters; circuit minimization. Elementary number theory: Factorability; properties of primes; greatest common divisors and least common multiples; Euclid's algorithm; modular arithmetic; the Chinese Remainder Theorem. The course also includes Predicate logic: Universal and existential quantification; modus ponens and modus tollens; limitations of predicate logic. Recurrence relations: Basic formulae; elementary solution techniques. Graphs and trees: Fundamental definitions; simple algorithms; traversal strategies; proof techniques; spanning trees; applications. Matrices: Basic properties; applications.

IS100 Information Systems Fundamentals

أساسيات نظم المعلومات

Fundamental concepts, objective of information system, system definition, subsystem definition, message passing in information system, message levels data, information, knowledge, needs, characteristics, sources, data processing (DP), electronic data processing (EDP), management information system (MIS), economics of information systems, decision support system (DSS), office automation system (OAS), executive information system (IS), expert system (ES), computer based information system (CBIS), type of CBIS, relationships among CBISs, the evolutionary view, the hierarchical view, the contingency view, the importance of CBIS, the nature of information system in different organization. Management concepts in CBIS, data management, the organization of data, application oriented files, database approach, decision-making concepts and tools, decision support system (DSS), building a DSS, application of DSS, evaluation of information systems. Recent correlated software packages should be used through labs.

CS200 Data Structures and Algorithms

<div dir="rtl">

هياكل البيانات و الخوارزميات

</div>

Introduce the fundamental concepts of data structures and the algorithms. Topics include recursion, the underlying philosophy of object-oriented programming, fundamental data structures (including stacks, queues, linked lists, hash tables, trees, and graphs), the basics of algorithmic analysis, and an introduction to the principles of language translation. The course also includes Review of elementary programming concepts. Fundamental data structures: Stacks; queues; linked lists; hash tables; trees; graphs. Object-oriented programming: Object-oriented design; encapsulation and information hiding; classes; separation of behavior and implementation; class hierarchies; inheritance; polymorphism. Fundamental computing algorithms: O(N log N) sorting algorithms; hash tables, including collision-avoidance strategies; binary search trees; representations of graphs; depth- and breadth-first traversals. Recursion: The concept of recursion; recursive mathematical functions; simple recursive procedures; divide-and-conquer strategies; recursive backtracking; implementation of recursion. Basic algorithmic analysis: Asymptotic analysis of upper and average complexity bounds; identifying differences among best, average, and worst case behaviors; big "O," little "o," omega, and theta notation; standard complexity classes; empirical measurements of performance; time and space tradeoffs in algorithms; using recurrence relations to analyze recursive algorithms. Algorithmic strategies: Brute-force algorithms; greedy algorithms; divide-and-conquer; backtracking; branch-and-bound; heuristics; pattern matching and string/text algorithms; numerical approximation algorithms

DS200 Operation Research

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بحوث العمليات

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This course is an introduction to the use of quantitative methods in business decision-making. Topics include linear programming, decision making under certainty, forecasting, queuing, and inventory systems. Recent correlated software packages should be used through labs.

DS201 Project Management

<div dir="rtl">

إدارة المشروعات

</div>

This course contains evaluation, selection and organization of technical projects. Concepts of the network-based project management methodology Network development. Project planning, scheduling, and control, Project cost management. Resource constrained projects. Commercial software packages will be used throughout the course. The course will also introduce some contemporary project management subject such as: e-projects, and intelligent project management. Recent correlated software packages should be used through labs.

IT200 Computer Architectures

<div dir="rtl">

معمارية الحاسب

</div>

An introduction to computer architecture. Includes a survey of computer architecture fundamentals exemplified in commercially available computer systems, including classical CPU and control unit design, register organization, primary memory organization and access, internal and external bus structures, and virtual memory schemes. Alternatives to classical machine architecture, such as the stack machine and the associative processor, are defined and

compared. Parallel processors and distributed systems are also presented, along with an analysis of their performance relative to nonparallel machines. Recent correlated software packages should be used through labs.

BS201 Statistics and Empirical Methods for Computing

<div dir="rtl">

الإحصاء والطرق التجريبية للحاسبات

</div>

Principles of discrete probability with applications to computing. Basics of descriptive statistics. Distributions, including normal (Gaussian), binomial and Poisson. Least squared concept, correlation and regression. Statistical tests most useful to software engineering: t-test, ANOVA and chi-squared. Design of experiments and testing of hypotheses. Statistical analysis of data from a variety of sources. Applications of statistics to performance analysis, reliability engineering, usability engineering, cost estimation, as well as process control evaluation.

CS300 Operating Systems

<div dir="rtl">

نظم التشغيل

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This course will provide an introduction to operating system design and implementation. The course will start with a brief historical perspective of the evolution of operating systems over the last fifty years, and then cover the major components of most operating systems. This will include: Computer system structures, Operating system structures, Process and Process management: process synchronization and mutual exclusion; two- process solution and Dekker's algorithm, semaphores (producer- consumer, readers-writer, dining philosophers, etc), Interprocess communication, Process synchronization, Deadlocks, thread management, CPU scheduling: multiprogramming and time-sharing, scheduling approaches (SJF, FIFO, round robin, etc), Memory hierarchy and management: with and without swapping, virtual memory-paging and segmentation, page replacement algorithms, implementation., Virtual memory, Secondary storage management, I/O device management , File system: interface and implementation, FS services, disk space management, directory and data structure, Protection and security, and Case studies: Linux and Windows. Recent correlated software packages should be used through labs.

DS300 Modeling and Simulation

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النمذجه والمحاكاة

</div>

Basic simulation modeling, nature of simulation. system models & simulation, discrete event simulation, simulation of a single-server queuing system, simulation of an inventory system, list processing in simulation, simulation languages, simulation of time sharing systems, simulation output data and stochastic processes, building valid and credible simulation models, principles of valid simulation modeling, verification of simulation computer programs, an approach for developing valid &credible simulation models, statistical procedures for computing real-world observation & simulation output data, some practical considerations: selecting input probability distributions, random number generators, generating random variables, output data analysis for a single system. Recent correlated software packages should be used through labs.

IT300 Multimedia and Computer Graphics

<div dir="rtl">

الوسائط المتعددة و الرسم بالحاسب

</div>

This course examines one or more selected current issues in the area of image synthesis. Specific topics covered are dependent on the instructor. Potential topics include: scientific visualization, computational geometry, photo-realistic image rendering and computer animation, Organization and structure of modem multimedia systems; audio and video encoding. Quality of service concepts; Screen resolution and screen technology, video accelerator design system, raster graphics (3D- transformation), analog- to-digital conversion, video compression, mixing and displaying at 30 FPS with full color capacity. Recent correlated software packages should be used through labs.

IS300 Database Concepts

<div dir="rtl">

مفاهيم قواعد البيانات

</div>

File organization and record storage; heap, sorted, and index files including B-trees and disk based hashing algorithms; entity relationship model, relational model, relational languages; database normalization; implementation of heap files and indexing techniques. Other topics include database modelling, operations in the relational model, database language SQL, constraints in SQL, system aspects of SQL. Lab works using Oracle. Recent correlated software packages should be used through labs.

IT301 Computer Networks

<div dir="rtl">

شبكات الحاسب

</div>

The principles and practice of computer networking, with emphasis on the Internet. The structure and components of computer networks, packet switching, layered architectures, OSI 7 layer model, TCP/IP, physical layer, error control, window flow control, local area networks (Ethernet, Token Ring; FDDI), network layer, congestion control, quality of service, multicast. Recent correlated software packages should be used through labs.

CS301 Artificial Intelligence

<div dir="rtl">

الذكاء الإصطناعي

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This is an introductory AI course. Topics will include Artificial and human intelligence, Overview of Artificial Intelligence, Basic Problem-Solving Strategies, Heuristic Search, Problem Reduction and AND/OR Graphs, domains of AI- symbolic processing: semantic nets, modeling model based reasoning, frames. Knowledge Representation, Representing Knowledge with If-Then Rules. Inference Engines, Inference techniques: implication, forward and backward chaining, inference nets, predicate logic, quantifiers, tautology, resolution, and unification. Rule based systems: inference engine, production systems, problem solving, planning, decomposition, and basic search techniques. AI languages: symbolic and coupled processing prolog: objects and relations, compound goals, backtracking, search mechanism, dynamic databases, lisp, program structure and operations, functions, unification, memory models. Fields of AI: heuristics and game plying, automated reasoning, problem solving, computational linguistics and natural language processing, computer vision, intelligent agents, robotics AI based computer systems: sequential and parallel inference machines, relation between AI and artificial neural nets, fuzzy systems. Recent correlated software packages should be used through labs.

SE200 Introduction to Software Engineering

مقدمة إلى هندسة البرامجيات

Principles of software engineering: Requirements, design and testing. Review of principles of object orientation. Object oriented analysis using UML. Frameworks and APIs. Introduction to the client-server architecture. Analysis, design and programming of simple servers and clients. Introduction to user interface technology. The course also includes Develop clear, concise, and sufficiently formal requirements for extensions to an existing system, based on the true needs of users and other stakeholders. Apply design principles and patterns while designing and implementing simple distributed systems-based on reusable technology. Create UML class diagrams which model aspects of the domain and the software architecture. Create UML sequence diagrams and state machines that correctly model system behavior. Implement a simple graphical user interfaces for a system. Apply simple measurement techniques to software. Demonstrate an appreciation for the breadth of software engineering

SE201 Engineering Economics

الإقتصاديات الهندسية

The scope of engineering economics; mesoeconomics; supply, demand, and production; costbenefit analysis and break-even analysis; return on investment; analysis of options; time value of money; management of money: economic analysis, accounting for risk. The course also includes Analyze supply and demand for products. Perform simple break-even analyses. Perform simple cost-benefit analyses. Analyze the economic effect of alternative investment decisions, marketing decisions, and design decisions, considering the time value of money and potential risk.

SE202 Software Construction

بناء البرامج

General principles and techniques for disciplined low-level software design. BNF and basic theory of grammars and parsing. Use of parser generators. Basics of language and protocol design. Formal languages. State-transition and table-based software design. Formal methods for software construction. Techniques for handling concurrency and inter-process communication. Techniques for designing numerical software. Tools for model-driven construction. Introduction to Middleware. Hot-spot analysis and performance tuning. The course also includes Apply a wide variety of software construction techniques and tools, including state-based and table-driven approaches to low-level design of software. Design simple languages and protocols suitable for a variety of applications Generate code for simple languages and protocols using suitable tools. Create simple formal specifications of low-level software modules, check the validity of these specifications, and generate code from the specifications using appropriate tools. Design simple concurrent software. Analyze software to improve its efficiency, reliability, and maintainability

SE203 Software Engineering Approach to Human Computer Interaction

نظرة هندسة البرامجيات إلى تفاعل الإنسان مع الحاسب

Psychological principles of human-computer interaction. Evaluation of user interfaces. Usability engineering. Task analysis, user-centered design, and prototyping. Conceptual models and metaphors. Software design rationale. Design of windows, menus, and commands. Voice and natural language I/O. Response time and feedback. Color, icons, and sound. Internationalization and localization. User interface architectures and APIs. Case studies and project. The course also includes Evaluate software user interfaces using heuristic evaluation and user observation techniques. Conduct simple formal experiments to evaluate usability hypotheses. Apply user centered design and usability engineering principles as they design a wide variety of software user interfaces

SE300 Software Design and Architecture

معمارية و تصميم البرامج

An in-depth look at software design. Continuation of the study of design patterns, frameworks, and architectures. Survey of current middleware architectures. Design of distributed systems using middleware. Component based design. Measurement theory and appropriate use of metrics in design. Designing for qualities such as performance, safety, security, reusability, reliability, etc. Measuring internal qualities and complexity of software. Evaluation and evolution of designs. Basics of software evolution, reengineering, and reverse engineering. The course also includes Apply a wide variety of design patterns, frameworks, and architectures in designing a wide variety of software. Design and implement software using several different middleware technologies. Use sound quality metrics as objectives for designs, and then measure and assess designs to ensure the objectives have been met. Modify designs using sound change control approaches. Use reverse engineering techniques to recapture the design of software

SE301 Software Quality Assurance and Testing

اختبار و ضمان جودة البرامج

Quality: how to assure it and verify it, and the need for a culture of quality. Avoidance of errors and other quality problems. Inspections and reviews. Testing, verification and validation techniques. Process assurance vs. Product assurance. Quality process standards. Product and process assurance. Problem analysis and reporting. Statistical approaches to quality control. The course also includes Conduct effective and efficient inspections. Design and implement comprehensive test plans. Apply a wide variety of testing techniques in an effective and efficient manner. Compute test coverage and yield, according to a variety of criteria. Use statistical techniques to evaluate the defect density and the likelihood of faults. Assess a software process to evaluate how effective it is at promoting quality

SE302 Software Requirements Analysis

تحليل متطلبات البرامج

Domain engineering. Techniques for discovering and eliciting requirements. Languages and models for representing requirements. Analysis and validation techniques, including need, goal, and use case analysis. Requirements in the context of system engineering.

Specifying and measuring external qualities: performance, reliability, availability, safety, security, etc. Specifying and analyzing requirements for various types of systems: embedded systems, consumer systems, web-based systems, business systems, systems for scientists and other engineers. Resolving feature interactions. Requirements documentation standards. Traceability. Human factors. Requirements in the context of agile processes. Requirements management: Handling requirements changes. The course also includes Discover or elicit requirements using a variety of techniques. Organize and prioritize requirements. Apply analysis techniques such as needs analysis, goal analysis, and use case analysis. Validate requirements according to criteria such as feasibility, clarity, freedom from ambiguity, etc. Represent functional and non-functional requirements for different types of systems using formal and informal techniques. Specify and measure quality attributes. Negotiate among different stakeholders in order to agree on a set of requirements. Detect and resolve feature interactions

SE401 Software Project Management

إدارة مشروعات البرامج

Project planning, cost estimation, and scheduling. Project management tools. Factors influencing productivity and success. Productivity metrics. Analysis of options and risks. Planning for change. Management of expectations. Release and configuration management. Software process standards and process implementation. Software contracts and intellectual property. Approaches to maintenance and long-term software development. Case studies of real industrial projects. The course also includes Develop a comprehensive project plan for a significant development effort. Apply management techniques to projects that follow agile methodologies, as well as methodologies involve larger-scale iterations or releases. Effectively estimate costs for a project using several different techniques. Apply function point measurement techniques. Measure project progress, productivity and other aspects of the software process. Apply earned-value analysis techniques. Perform risk management, dynamically adjusting project plans. Use configuration management tools effectively, and apply change management processes properly. Draft and evaluate basic software licenses, contracts, and intellectual property agreements, while recognizing the necessity of involving legal expertise. Use standards in project management, including ISO 10006 (project management quality) and ISO 12207 (software development process) along with the SEI's CMM model

SE402 Professional Software Engineering Practice

تطبيقات هندسة البرمجيات المتخصصة

History of computing and software engineering. Principles of professional software engineering practice and ethics. Societal and environmental obligations of the software engineer. Role of professional organizations. Intellectual property and other laws relevant to software engineering practice. The course also includes Make ethical decisions when faced with ethical dilemmas, with reference to general principles of ethics as well as codes of ethics for engineering, computing, and software engineering. Apply concern for safety, security, and human rights to engineering and management decision-making. Understand basics of the history of engineering, computing, and software engineering. Describe and apply the laws that affect software engineers, including laws regarding copyright, patents, and other intellectual property. Describe the effect of software engineering decisions on society, the economy, the environment, their customers, their management, their peers, and themselves. Describe the

importance of the various different professional societies relevant to software engineering in the state, province or country, as well as internationally. Understand the role of standards and standards-making bodies in engineering and software engineering. Understand the need for continual professional development as an engineer and a software engineer.

SE400 Software Engineering Project

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مشروع هندسة البرمجيات

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Development of significant software system, employing knowledge gained from courses throughout the program. Includes development of requirements, design, implementation, and quality assurance. Students may follow any suitable process model, must pay attention to quality issues, and must manage the project themselves, following all appropriate project management techniques. Success of the project is determined in large part by whether students have adequately solved their customer's problem.

معمارية نظم المعلومات (Application Domain Elective)

Information System	نظم المعلومات

IS400 Information System Architecture

معمارية نظم المعلومات

The goal of this course is to impart the fundamental concepts of information system architectures. In information technology and information systems, especially in the areas of computing, architectures refers to both dynamic view in form of processes and the specification of the overall structure, logical components, and the logical interrelationships of a system. The conceptual description of both views builds the methodological framework for understanding the alignment of software applications and information technologies, business processes and the corporate strategy. The course describes architectures of information systems and explains the concept of different architectural views and levels. The course objective is to understand information system architectures and the specification and design of information systems by using different modeling techniques and methodologies, e.g. entity relationship model, UML class diagram, organization chart, event-driven process chain, and function tree.

IS401 Object Oriented System Analysis and Design

تصميم وتحليل النظم الموجهة

This course covers object-oriented analysis and design with special emphasis on what software developers, architects and analysts need to know to successfully execute object-oriented projects. The course teaches a proven method of building software systems by using activities of domain/business modeling, system analysis, and system architecture and design. The course teaches and practices a set of skills applicable for both small (lightweight) as well as large (and more rigorous) projects. Models in the course are presented in the UML notation. The emphasis in the course is on making participants able to deliver high quality models and designs leading to implementations. The course teaches participants to build object models, to capture the structure and behaviors in the problem domain, capture requirements through use cases, and create and document architectures and designs. To produce the models, we will apply a step-by-step method that leads the participants through a set of development steps, and provides for high-integrity modeling by performing cross-checks between models, resulting in correct and consistent models. This method, which builds on the best processes for object-oriented development, will help establish a productive path from the problem domain to components and object-oriented code. The course provides numerous exercises and several case studies that enable participants to practice the learned material. Course can be followed up by mentoring, ensuring the fastest application of the analysis and design skills to the project at hand.

IS402 Business Process Engineering

هندسة إجراءات الأعمال

This course focuses on the design, management, and implementation of IT-supported processes. The evolution of information technology and the near ubiquity of the internet give

business firms the opportunity to completely redesign their business processes, to develop systems faster, and to implement systems in entirely new ways. topics covered in this course include business process analysis and design ,implementation, change management ,and performance measurement systems relevant technologies include web-based application serve providers, workflow management systems ,and enterprise systems .students learns how to analyze a business problem ,design new business processes ,and manage the implementation process .they also gain an understanding of the technology support structure required for successful implementation of organizational and interorganizational processes. Recent correlated software packages should be used through labs.

IS403 Database Management Systems

<div dir="rtl">

نظم إدارة قواعد البيانات

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An introduction to the theory and design of database management systems. Topics covered include internals of database management systems, fundamental concepts in database theory, and database application design and development. In particular, logical design and conceptual modeling, physical database design strategies, relational data model and query languages, query optimization, transaction management and distributed databases. Lab works using ORACLE. Recent correlated software packages should be used through labs.

IS404 Object Oriented Database

<div dir="rtl">

قواعد البيانات الموجهة

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History of data models. Semantic data models. Problems in record-oriented models. Object data model. Classes and inheritance. Methods and messages. Multiple inheritance. Object queries. Object queries languages OQL. Indexing in object databases. Processing object queries. Object transaction. Concurrency control in object databases. Security in object databases. Using the object model in advanced applications. Recent correlated software packages should be used through labs.

IS405 Distributed and Mobile Database

<div dir="rtl">

قواعد البيانات الموزعة والمحمولة

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This course will deal with the fundamental issues in large distributed systems that are motivated by the computer networking and distribution of processors, and control. The theory, design, implementation, and performance of large systems will be discussed. Concurrency, Consistency, Integrity, Reliability, Privacy, and Security in distributed systems will be included. Advanced features of the course include research related to Mobile Data Management, Streaming databases, and Peer to Peer systems.

IS406 Multimedia Database

<div dir="rtl">

قواعد بيانات الوسائط المتعددة

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This course aims to provide a basic study of the development of fundamental multimedia database systems, as well as applicable technologies for developing web-based multimedia applications. The former provides a basis for understanding the basic concepts and techniques pertinent to multimedia databases. The latter provides an in-depth study of more

sophisticated technologies, many of which are concerned with: (a) suitable data modeling capabilities within databases; (b) defining and manipulating multimedia data; (c) multimedia indexing and content-based retrieval techniques; (d) multimedia database architecture, and (e) extending the database system functionality for multimedia applications. In this course, we will study issues concerning both the traditional and modern database systems and technologies for multimedia data management.

IS407 Information system development methods and technologies

<div dir="rtl">

تكنولوجيا وطرق تطوير نظم المعلومات

</div>

This course examines the Systems Development Life Cycle and the technologies used to implement high-quality information systems. A variety of modeling techniques will be used by students to articulate client requirements and convert them into implementable specifications. Prototyping and methodology engineering will be covered. Recent correlated software packages should be used through labs.

IS408 Information Risk Assessment and Security Management

<div dir="rtl">

إدارة تقييم مخاطر المعلومات و تأمينها

</div>

!The proliferation of corporate databases and the development of telecommunication network technology as gateways or invitations to intrusion are examined. Ways of investigating the management of the risk and security of data and data systems are presented as a function of design through recovery and protection. issues of risk and security as they relate to specific industries and government are major topics in the course .Examples are presented of how major technological advances in computer and operating systems have placed data , as tangible corporate assets , at risk . Quantitative sampling techniques for risk assessment and for qualitative decision making under uncertainty are explored. Recent correlated software packages should be used through labs.

IS409 Expert Systems and Decision Support Systems

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النظم الخبيرة ونظم دعم القرار

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This course is a comprehensive treatment of decision support systems (DSS) and Expert Systems (ES) as managerial support tools. This course will examine the design, development and implementation of information technology based systems that support managerial and professional work, including Communications-Driven and Group Decision Support Systems (GDSS), Data-Driven DSS, Model-Driven DSS, Document-Driven DSS, and expert systems (knowledge-based systems. It will also cover the following topics in ES: overview of AI and ES, knowledge engineering, knowledge acquisition techniques, knowledge representation techniques, reasoning techniques, and building expert systems. Also the students will learn how to use expert system shells such as EXSYS in building some ES applications. Recent correlated software packages should be used through labs.

E-Commerce	**التجارة الاليكترونية**

EC400 Information Systems: An E-Commerce Introduction

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مقدمة في التجارة الإلكترونية

</div>

This course should examine the changing role of information technology and management information systems in organizations. Role of IT and MIS as competitive tools. Examine the current and potential impact of information and information technology on all aspects of his or her position, firm, and industry systematically. Since this a graduate level course, this course will focus on it from the perspective of managers. For example, case studies describing the role of IT and MIS as competitive tools should be covered extensively. Since e-business is the next major revolution-students will be expected to understand the technology of ecommerce and the impact of ecommerce on MIS. Topics include IT systems, strategic and competitive opportunities ,databases and data warehouse, decision support systems, networks, emerging technologies , planning for IT systems ,developing IT systems, managing IT systems. With regards to e-commerce and e-business: Business to consumers e-commerce , business to business e-commerce , The role of government in promoting e-commerce ,e-commerce payment systems and digital cash , security and privacy Issues; e-business vs. e-commerce. Recent correlated software packages should be used through labs.

EC401 Web Technology: Servers and Software

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تكنولوجيا الإنترنت

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Introduction client/server architecture and multi-tiered architecture as it pertains to web technology. It provides fundamentals of hardware ands software as well as middleware. The course also provides some introduction to the following topics: Telecommunication, Web Server Administration, web Server planning, HTTP, and security. Web Server Administration: understanding of what is required to configure a web server and keep it running. Planning of a web server - from sizing and performance issues to choosing server software an ISP**.** How the HTTP protocol works, how ASP/JSP/CGI programs execute various methods for publishing documents on a web server. Detects and fix problems and how to generate server statistics issues by analyzing server log files. Web security introduction -covers the security issues surrounding the web. Types of threats and protecting the machines and users against these threats, web client security. Recent correlated software packages should be used through labs.

EC402 Web Programming

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برمجة الإنترنت

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This course presents a complete immersion into web programming. HTML language is covered in this course if students have not picked it up else where. Other topics include Dynamic HTML: Scripting using JavaScript and XML; server side components such as CGI, ASP and PERL are also introduced in this course .the course focuses on building competencies in the client/server development for web sites used in the internet/intranet environments. Java is also introduced here. Recent correlated software packages should be used through labs.

EC403 Object Structured Analysis and Logic Design

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تحليل وتصميم منطقى للهياكل الموجهة

</div>

This course focuses on the systems development life cycle for creating web applications; the focus is on object-oriented systems analysis and design. It introduces different paradigms or developing web software, the key stages of the life cycle and identifies key deliverables for each stage .Object technology is introduced in this course and importance o object-oriented paradigm underscored. The students should be able o identify best architectural methods for any project; understand concepts such as abstraction refractory and architectural prototyping. Topics include information systems development, object oriented analysis .object-oriented design players in the systems Game, UML,use cases , class models , project management , systems analysis , requirements discovery , data and process modeling feasibility analysis, systems design application architecture ,output design and prototyping , input design and prototyping user interface design. Recent correlated software packages should be used through labs.

EC404 Telecommunications and Web Security

<div dir="rtl">

نظم الإتصالات وأمان الشبكات

</div>

This course provides networking knowledge needed to succeed in the Web environment. Topics can range from networking topology to networking media, network standards to Ethernet, optimization to streaming media, web protocols to DSL access. Advanced web security concepts need to be covered in this course as well such   as intrusion detection and recovery, viruses, firewalls, encryption, PGP. From the e-business perspective topics covered include Electronic Payment mechanisms (and security of transaction), client-side security ,web document security, server side security, securing electronic commerce environments, analysis of the major classes of Electronic Commerce security, and survey of new trends. Topics include network characteristics, network models, WANs, internet works, intranets, and extranets; Architecture: packet-switched networks, client/server architectures, Ethernet, network components, and more; Protocols: IP, TCP, UDP, DNS,HTTP, SMTP, MIME, FTP, MAC address, and more; Applications: mail, web services, FTP, push and pull technologies, and streaming multimedia ; connectivity: DSL, T-1/T-3, ISDN, wireless networks, and cable modem connectivity; security: Encryption, SSL, SHTTP, HTTP, SET, firewalls, snifters, proxy servers, and VPNs; Web Server Support : Web development , scripting, JavaScript, CGI,server-side APIs, and dynamic content; intrusion detection and recovery; detecting an attack and recovering from an attack; secure online transactions : Encryption; secure socket layer; certificate authororities; Access Control lists. Client side security topics: Active content attacks, browser bugs web master attacks, cookies, and SSL weakness. Recent correlated software packages should be used through labs.

EC405 DBMS: Physical Design and Implementation

<div dir="rtl">

التصميم والتطبيق الفعلى لنظم إدارة قواعد البيانات

</div>

The focus of such a course is two fold-first to introduce database concepts and to focus on data and information modeling (including systems design) and implementation within a DBMS environment. Students also learn to use a popular DBMS system such as Oracle. Topics include Database Environment, DBMS, data models, relations model, object model (OODBMS), principles of database (relation algebra), SQL, normalization. Relational

database design, implementation and support. Each student/team can be asked to design and implement a small relational data base system using Oracle. Students should be able to connect web applications to a DBMS and store and update data remotely via a web interface. Recent correlated software packages should be used through labs.

EC406 e-Business System Strategy

إستراتيجية نظم الأعمال الإلكترونية

This course focuses on business process redesign and change the management in the context of e-business. Topics include impact of e-business on business models, channel relationships and the value chain, integration of emerging technologies with legacy systems, functional and inter-organizational integration, and transaction cost issues. Applications include supply and selling chain management, customer relation management, enterprise resource planning, e-procurement, and knowledge tone applications. Recent correlated software packages should be used through labs.

EC407 Managing Digital Firms

إدارة الشركات الرقمية

This course focuses on the use of both traditional and web-based information technologies to manage the firm .these technologies make possible new business models, new organizational structures ,and new management processes .topics covered in new technology infrastructure and architecture, major functional applications of IT within the firm ,new IT-based business models, enterprise systems, knowledge management ,multinational systems ,managerial decisions about technology, and new organizational forms. Recent correlated software packages should be used through labs.

EC408 Technologies for B2B E-Commerce

تكنولوجيات تجارة الأعمال الاليكترونية

IT strategies, process design principles and information technologies for business-to-business e-commerce. Coverage of traditional firms ' planning process to establish e-business operational ,sales and web-based marketing capabilities. Economic analysis of bundling, aggregation and digital product pricing policies , and the role of technology standards and sponsored technologies in large-scale e-commerce .industry infrastructures for e-commerce , including security ,e-payment and transient data sharing and modeling approaches. Enabling technologies in business-to-business contexts. Financial justification of e-commerce and e-business technology investments. web sever and content management approaches for e-business ;development and design issues for large-scale e-commerce operations .hands on experience with e-commerce software development tools . Recent correlated software packages should be used through labs.

GIS400 Introduction to Geographic Information Systems

مبادئ نظم المعلومات الجغرافية

Provides an introduction to Geographic Information Systems and their applications. Emphasizes the concepts needed to use GIS effectively for manipulating, querying, analyzing, and visualizing spatial-based data. Industry-standard GIS software is used to analyze spatial patterns in social, economic and environmental data, and to generate cartographic output from the analysis. Recent correlated software packages should be used through labs

GIS401 Geodatabase Design

تصميم قواعد البيانات الجغرافية

The goal of this course is to introduce the main features of spatial databases, the kernel of Geographic Information Systems (GIS). Topics include: spatial concepts and data models, spatial query languages, spatial storage and indexing, query processing and optimization, spatial networks, introduction to spatial data mining. Exercises and practical work will be concentrated on building and designing geodatabases. Recent correlated software packages should be used through labs.

GIS402 Spatial Analysis and Modeling

التحليل والنمذجة باستخدام نظم المعلومات الجغرافية

This course explores methods of analyzing spatial data in the interactive and graphical environment of a GIS. The course draws on related theory in spatial statistics, geo-statistics, geographical analysis and cartographic modeling to provide a set of generic techniques for GIS users. Topics include the analysis of point patterns, networks, overlay analysis, spatial interaction models, and visualization of spatial data (virtual reality, simulation of landscape, animation, multi-media). The course concludes by considering how to extend the spatial analytical capabilities of GIS and points to the evolution of spatial decision support systems. Associated exercises and hands-on allow methods to be applied in a GIS context. Recent correlated software packages should be used through labs.

GIS403 GIS Programming and Customization

برمجة نظم المعلومات الجغرافية

Students learn to use the Visual Basic for Applications (VBA) programming environment to add functionality to ArcGIS. Students who successfully complete the course are able to automate repetitive tasks, customize the ArcGIS interface, and share their customizations with others. Recent correlated software packages should be used through labs.

GIS404 Web-Based GIS

نظم المعلومات الجغرافية الشبكية

Provides a conceptual overview and hands-on experiences in Internet mapping and web-based geospatial information processing with state-of-the-art commercial software. Topics covered

included client/server configuration, distributed data access and display, web-based user interaction and customization. Recent correlated software packages should be used through labs.

GIS405 GIS Management and Implementation

<div dir="rtl">

إدارة وتنفيذ نظم المعلومات الجغرافية

</div>

Management strategies for GIS are examined by presenting GIS as an integrated system of people, computer hardware, software, applications and data. Implementation is examined as a systematic process of user needs assessment, system specification, database design, application development, implementation, operation, and maintenance. Includes design of implementation plans as case studies to explore various techniques associated with each step of this process. Recent correlated software packages should be used through labs.

GIS406 Spatial Decision Support Systems

<div dir="rtl">

نظم دعم القرارات الجغرافية

</div>

This course introduces students to key theories, concepts and techniques that have been developed recently to improve the decision support capabilities of spatial information systems. Topics covered include participatory GIS, group-based spatial decision support systems, and the integration of multi-criteria analysis (MCA) methods with GIS to facilitate decision making in planning. Recent correlated software packages should be used through labs.

GIS407 Urban and Environmental Applications of GIS/RS

<div dir="rtl">

التطبيقات البيئية و المدنية لنظم المعلومات الجغرافية و الاستشعار عن بعد

</div>

This course focuses on the application of remote sensing and GIS techniques to solving real-world urban and environmental problems. Applications may include analyses of urban and suburban landscape, land use and land cover, and communication, vegetation and forestry, biodiversity and ecology, water and water quality control, soils and minerals, geology and geomorphology, etc. Recent correlated software packages should be used through labs.

GIS408 GIS Network Modeling

<div dir="rtl">

نمذجة الشبكات باستخدام نظم المعلومات الجغرافية

</div>

Examines the theory of network analysis and its application in Geographic Information Systems. Topics covered include graph theoretic measures of network connectivity and proofs of network properties; optimization problems including shortest path algorithms, flow algorithms, and assignment problems on networks; special solution procedures for the classic transportation problem; procedures for linear referencing and urban travel demand modeling. The implementation of these algorithms and procedures with GIS data structures is explored using industry standard GIS software. Recent correlated software packages should be used through labs.

CS400 C# -Application Development in .NET

<div dir="rtl">

تطبيقات لغة C#
</div>

This course will help in understand concepts. COM, COM+, and .NET, Common runtime, Metadata, API. JIT compilation, Development and debugging, Developing applications with C#, Visual Studio® .NET. The IDE for .NET, Programming with C#. Writing. Using reflection. Inheritance. Overloading. Interfaces. Dynamic method invocations, NET infrastructure. Assemblies. Building and deploying. Metadata. Versioning. Security., XML in .NET. Controlling XML format. Serialization, Windows application, ASP .NET. Session tracking. Configuring. Security. Error handling, ADO .NET (DataSets, DataReader), Manipulating data. Data display facilities. Configuration files. Tracing, Debugging, Web services. Writing clients, .NET 2.0. Language and framework features, ASP .NET 2.0. Smart clients.

CS401 Java Programming (J2SE)

<div dir="rtl">

البرمجة باستخدام الجافا
</div>

This course is designed to teach you how to write computer programs, using the Java programming language. The course is an introductory course where you will learn how to design and implement applets and applications. Introduction to Programming, Using Objects, Primitive Data, Writing Methods, Selection, Iteration, Debugging, Arrays, Composite Objects, Inheritance, Graphics, Applications, Streams, Java 2 Features

CS402 Agile Software Development

<div dir="rtl">

تطوير البرمجيات الرشيقة
</div>

Learn the secrets to developing agile software - faster, more adaptable, and more dextrous programs. In addition to looking at general design issues, participants will be introduced to UML, object modeling, and issues of planning, testing, Software development process, Object modeling and UML , Software planning, Test-driven development, Decoupling, isolation, and mock objects, Refactoring issues, Object-oriented design principles, Design patterns: Creational, structural, and behavioral, Framework specific design patterns, Agile methodologies, Agile practices to improve productivity, and Improving the development process.

CS403 ASP .NET - Web Development for Software Professionals

<div dir="rtl">

تطبيقات إنشاء المواقع
</div>

Learn to develop Web-based applications with high performance and scalability using Microsoft Active Server Pages, especially focus on Web-Based Programming. Concepts and protocol. Server-browser interaction, .NET and CLR. Introduction to .NET and CLR, features, benefits, and overview of VB .NET, HTTP Protocol. Methods, data transfer, queries, DHTML. DOM, CSS2, attributes, events, Netscape, and IE extensions, Scripting. Overview of VBScript, JavaScript, and document objects, ASP .NET. Server and ASP .NET, ASP vs. ASP .NET, IIS model, ASP .NET Object Model. Classes in the ASP .NET model. Using code behind, ASP .NET Controls. Server controls and validation, server-side events, Web forms,

Using VS .NET. Creating projects, development, and deployment using Visual Studio, ASP .NET Facilities. Interaction with server, tracking sessions, session objects, ASP .NET Interactions. Interacting with other pages, forwarding, including, Performance Techniques. Caching, refreshing, client pull, buffering, issues, Managing Applications. The concept of an application. Application objects, Database Access. ASP .NET and ADO .NET, database access. XML access classes, Security. Security issues and concepts, authorization techniques, SSL, ASP .NET security, XML and Web Services. XML and XSL in ASP .NET. Creating and using Web services.

CS404 Enterprise Java With EJB and J2EE

تطبيقات انتربريز جافا

Learn the benefits and prudent use of EJB for developing enterprise applications with high performance and scalability. Focusing on HTTP Protocol. Overview of HTTP, browser, and Web server communication, Servlets. Benefits and facilities of Servlet API, Servlet Life Cycle. Servlet creation, life cycle, and interaction with Web server, Host/Client/User Information. Obtaining information about server, client, and users, Session Management. Session tracking using cookies and session objects, JSP. The benefits of JSP and comparing it to servlets, JavaBeans. Understanding how JavaBeans help provide extensibility with servlets and how they differ from Enterprise JavaBeans, JDBC. Java's database connectivity with API, benefits, and details on database access, RMI. Java's facilities for remote method invocation and accessing remote objects, JNDI. The Java Naming and Directory Interface, benefits, facilities, and issuesEJB. Benefits of EJB. EJB 2.0 API specifications, Related Technologies. How JDBC, Servlets, JSP, RMI, and JNDI relate to EJB, Beans. Types of beans. EJB interfaces: Home interface, remote interfaceBean Environment. Understanding application servers, containers, and beans, Session and Entity Beans. Behavior, lifetime, client interaction, management, Persistence and Transactions. Container-managed versus bean-managed, Servlet/Bean Interaction. Packaging servlets with Beans. Bean-servlet interaction, Deployment Techniques. Deployment using tools and programs, Message-Driven Beans. Overview of JMS, JMSAPI, message-driven beans behavior, and interaction.

CS405 .NET Web Services

خدمات الويب

Gain hands-on experience with development of Web Services. Learn the problems it can solve, issues that need to be considered in developing Web Services, and what is expected from a developer writing a Web Service. XML and XML Schema Definition, State of Distributed Object Computing Technologies, Limitation and Issues with Current Technologies, XML as Write Protocol: SOAP, What is a Web Service?, What is .NET? Architecture, CLR, Assemblies, Protocol for the Web Services: SOAP, UDDI, WSDL, DISCO, Writing a Web Service: Server Side Components, Using a Web Service: Client Side Components, Object Remoting Using Web Services: Object Activation, Marshaling, Security in Web Services, Architecture and Details of Classes, Interfaces, and Components, Interoperability Between .NET Web Services and Other Systems Including Java

CS406 XML- Application Development

تطوير تطبيقات XML

Participants will gain hands-on experience developing applications using XML. An introduction to XML, this course will provide insight into accessing XML documents and into

various parsers and parsing techniques, XML Benefits. Overview of application development issues, XML Documents. Rules of XML, well-formed and valid documents, Parsing. Parsers for various languages, DTD. Expressing structure. Benefits and drawbacks, XML Schema. Benefits and power. Tools and techniques for generation, Modeling With XML. Designing applications for the effective use of XML, Parsing Using DOM. What is DOM? Benefits and issues of DOM, DOM API, Programming With DOM. Accessing XML documents using DOM, JavaScript, and Java. Accessing from other languages, SAX. Benefits and comparison of SAX with DOM. Using SAX API with Java, XML Namespaces. Need and benefits, creating and using namespaces, XPATH and XPointer. Expressive power of query language. Syntax and usage, XSLT. Transforming XML documents. Stylesheet generation and processing, Database Access. Generating XML documents from databases, Distributed Computing. Issues with distributed applications, SOAP. SOAP protocol, mechanism, and usage.

CS407 Natural language Processing

معالجة اللغات الطبيعية

Brief history of NLP research, current applications, generic NLP system architecture, knowledge-based versus probabilistic approaches, Finite-state techniques. Inflectional and derivational morphology, finite-state automata in NLP, finite-state transducers, Prediction and part-of-speech tagging. Corpora, simple N-grams, word prediction, stochastic tagging, evaluating system performance, Parsing and generation. Generative grammar, context-free grammars, parsing and generation with context-free grammars, weights and probabilities, Parsing with constraint-based grammars. Constraint-based grammar, unification, Compositional and lexical semantics. Simple compositional semantics in constraint-based grammar. Semantic relations, WordNet, word senses, word sense disambiguation, Discourse and dialogue. Anaphora resolution, discourse relations, Applications. Machine translation, email response, spoken dialogue systems.

CS408 Computer Arabization

تعريب الحاسب الآلي

Introduction. Arabic Language Characteristics. Arabic Character Sets. Standardization. Arabic Characters for screen and printers. Arabization systems. Arabic software tools, and programming languages. Introduction to Arabic Computations. Projects in specific discipline using available tools. Recent correlated software packages should be used through labs.

IT412 LANS and Routing

<div dir="rtl">الشبكات المحلية والتوجيه</div>

This subject provides students with knowledge of LAN hardware and physical layer standards, and basic computer networking concepts and principles, and introduces local area network (LAN) design and the use of routers and routing in autonomous system intranets. It also explains how this access WANS.

IT413 Mobile Communications and Computing

<div dir="rtl">الاتصالات والحسابات الجواله</div>

This subject covers the development of the wireless network technology from cellular networks to IP wireless networks. The emphasis is on the concepts, infrastructure and protocols for supporting device and user mobility. The subject also focuses on the development of a simple application using Wireless Application Protocol (WAP) and Wireless Markup Language (WML).

IT414 Network Security

<div dir="rtl">أمان الشبكات</div>

This subject consolidates students' understanding of network security by considering security principles, methodologies and technologies from a technical and management perspective. Issues such as policy-based networking, directory services, IPsec, and basic methodologies such as firewalls, proxies, encryption and authentication are dealt with.

IT415 UNIX Systems Programming

<div dir="rtl">برمجة نظام UNIX</div>

This subject allows students to develop their Perl and UNIX knowledge and skills appropriate for professional practice in a UNIX environment. It also exposes students to other high-level scripting utilities. This is of general benefit and is not covered elsewhere in the course.

IT416 Wide Area Network Implementation

<div dir="rtl">تركيب الشبكات واسعة المدى</div>

This subject complements and extends the theory and practice learned in the prerequisite subject. It extends skills and knowledge in WAN issues for part-time and full-time connectivity. Legacy systems, Frame relay, ISDN and POTS technologies are covered. Newer WAN technologies, wireless, IPSec VPNs, and DSL variants are introduced. Managing secure access to network devices using AAA and RADIUS servers is shown.

IT418 Multilayer Switched Networks

<div dir="rtl">الشبكات التحويلية متعددة الطبقات</div>

Multilayer Switched Networks are now in use in a single building's LAN and extend out to Campus LANs. Performance, availability and high quality infrastructure combine to change the way businesses use computer networks. Voice, video, data and interactive traffic are

now part of the traffic mix that campus LANs must handle. Multilayer switched networks must achieve, at campus level, the performance and availability requirements of business critical systems. This subject extends skills and knowledge in the design and implementation of switched campus networks using VLANs for performance, reliability and security. Traffic marking methods, protocols and techniques to ensure traffic Quality of Service (QoS) are explored at layer 2 and layer 3. Inter-VLAN routing uses layer 3 switches.

IT419 Network Analysis and Troubleshooting

<div dir="rtl">

اصلاح وتحليل الشبكات

</div>

The subjects 32009 Advanced Routing Principles, 32010 Wide Area Network Implementation and 32011 Multi Layer Switched Networks have allowed the student to develop knowledge and skills for the design and implementation of a variety of complex internetworking scenarios. This subject consolidates approaches to analyzing and correcting internetworks that are under-performing or failing by applying sound problem-solving principles to a series of structured laboratory exercises and case studies.

IT420 Internetwork Design

<div dir="rtl">

تصميم شبكة بينية

</div>

This subject combines the principles studied in 32542 LANs and Routing and the prerequisite subject and extends them. These are then applied to the design of internetworks.

IT421 Network Management

<div dir="rtl">

ادارة الشبكات

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This subject explains the role of the network manager and the network management system. It discusses the components of network management, i.e. fault management, performance management, configuration management, security management and accounting management. The integration of these components into an enterprise management system is addressed. The lecture material is integrated with laboratory sessions throughout, allowing students to experience aspects of network management.

| **Decision Support** | **دعم القرار** |

DS400 Computer Simulation Technique

نظم المحاكاة بالحاسوب

Basic discrete event simulation methodology: random number generators, simulation designs, validation, analysis of simulation output. Applications to various areas of scientific modeling. Simulation language such as SLAM and GPSS. Computer assignments and projects.

DS401 Decision and Game Theory

نظرية الألعاب وصناعة القرار

This course includes basic concepts of decision making under certainty, risk and uncertainty, The use of decision tables, decision trees and sequential decision-making, opportunity loss, one-time decisions and expected value of information, conditional probability and decision analysis, multiple comparison and multiple ranking methods, examining the many facets of game theory, such as bargaining theory, non-cooperative games, cooperative games, games with incomplete information, several cases studies will be used to illustrate the application of decision theory to real world problems beside using commercial software package. Recent correlated software packages should be used through labs.

DS402 Stochastic Models in Operations Research and Decision   Support.

النماذج العشوائية في بحوث العمليات

This course covers a review of probability distributions and random variables. Markov chains, markov analysis, applications of markov chain in management science and decision support , random walk poisson process, truncated poisson process, pure birth process, pure death process, birth and death process, and their applications in operations research and decision support models. An introduction to queuing systems, single and multi-stage queuing models, queuing network models. Formulation and solution approaches of operation research models involving random variables or events, standard software packages are used as training tools in this course. Recent correlated software packages should be used through labs.

DS403 Inventory Control and Production Management

إدارة الانتاج ورقابة المخزون

This course includes introduction to a variety of production planning and inventory control problems, The development of mathematical and simulation model required to solve these problems, job-shop scheduling, work methods, maintenance and quality management topics will be covered, supply chain management, facility layout, statistical quality control, inventory management (independent and dependent inventory models), solution approaches including the use of the available operation management software packages. Recent correlated software packages should be used through labs.

DS404 Multi-objective Programming

البرمجة متعددة الأهداف

This course includes concepts of both the linear and nonlinear multi-objective programming: Utility theory. Different scalarization techniques (weighting approach…). Value theory. Goal programming methods. Interactive multi-objective programming methods. Parametric approaches for multi-objective programming. Applications and usage of software packages are stressed throughout the course. Recent correlated software packages should be used through labs.

DS405 Decision and Risk Management

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إدارة المخاطر وصناعة القرار

</div>

This course includes approaches to the management of risk, uncertainty and variability, quantifying uncertainty, probability assessment methods, model building and validation, use of software packages; extensions of decision analysis including stochastic and multi-attribute methods; applications to project management, scheduling, and cost estimation. Recent correlated software packages should be used through labs.

DS406 Computational Intelligence Application in Operation Research

<div dir="rtl">

الحسابات الذكية فى بحوث العمليات

</div>

This course will cover the three main components of computational intelligence: namely evolutionary, fuzzy, neural computation. An emphasis will be made on the application of computational intelligence (CI) techniques to optimization, prediction and modeling. Related heuristics techniques such as Ant Algorithms, genetic algorithms, neural networks, tabu search, simulated annealing may also be covered. The advantages and limitations as well as the guidelines for selecting the most efficient approach for various types of problems will be addressed. The implementation of CI techniques for various problems will be stressed throughout the course. Recent correlated software packages should be used through labs

DS407 Forecasting Techniques

<div dir="rtl">

الأساليب التنبؤية

</div>

This course is designed for students who want to know how forecasts are actually developed and utilized, emphasizing modern statistical methods that are widely used to generate business forecasts. Specific applications to business include forecasting sales, production, inventory, macroeconomic factors such as interest rates and exchange rates, and other aspects of both short- and long-term business planning Topics include a statistical review, data considerations, model selection, moving averages and exponential smoothing, regression analysis, time-series decomposition, Box-Jenkins (ARIMA) models, optimal forecast combination, and forecast implementation.

IS409   Expert Systems and Decision Support Systems

<div dir="rtl">

النظم الخبيرة ونظم دعم القرار

</div>

This course is a comprehensive treatment of decision support systems (DSS) and Expert Systems (ES) as managerial support tools. This course will examine the design, development and implementation of information technology based systems that support managerial and professional work, including Communications-Driven and Group Decision Support Systems (GDSS), Data-Driven DSS, Model-Driven DSS, Document-Driven DSS, and expert systems (knowledge-based systems. It will also cover the following topics in ES: overview of AI and ES, knowledge engineering, knowledge acquisition techniques, knowledge representation techniques, reasoning techniques, and building expert systems. Also the students will learn how to use expert system shells such as EXSYS in building some ES applications. Recent correlated software packages should be used through labs.

Software Engineering Program

Year one		Year two		Year three		Year four	
Semester A							
Code	Subject	Code	Subject	Code	Subject	Code	Subject
CS100	Programming Fundamentals	CS200	Data Structures and Algorithms	CS300	Operating Systems	SE400	Software Engineering Project
BS100	Mathematics	DS200	Operations Research	DS300	Modeling and Simulation	SE401	Software Project Management
HU100	English	SE200	Introduction to Software Engineering	SE300	Software Design and Architecture		Domain Elective (1)
BS101	Electronic Physics	SE201	Engineering Economics	HU200	Human Rights and IT Ethics		Domain Elective (2)
	Humanities Elective(1)		Humanities Elective(3)	IT201	Multimedia and Computer Graphics		Domain Elective (3)
Semester B							
Code	Subject	Code	Subject	Code	Subject	Code	Subject
CS101	Object-Oriented Paradigm	IT200	Computer Architecture	IS300	Database Concepts	SE400	Software Engineering Project
IS100	IS Fundamentals	SE202	Software Construction	SE301	Software Quality Assurance and Testing	SE402	Professional Software Engineering Practice
CS102	Discrete Structure	SE203	Software Engineering Approach to Human Computer Interaction	SE302	Software Requirement Analysis		Domain Elective (4)
HU101	Report Writing and Presentation Skills	DS201	Project Management	IT300	Computer Networks		Domain Elective (5)
	Humanities Elective(2)	BS200	Statistics and Empirical Methods for Computing	CS301	Artificial Intelligence		Domain Elective (6)

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IS	نظم المعلومات	3
DS	دعم القرار	4
GIS	نظم المعلومات الجغرافية	5

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المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
مواد اجبارية (9 ساعات)					
---	3	3	3	English	HU100
HU100	3	3	4	Report Writing and Presentation Skills	HU101
---	-	3	2	Human Rights and IT Ethics	HU200
المواد الاختيارية (9 ساعات)					
---	2	3	3	Organizational Behavior	HU103
---	2	3	3	Fundamental of Management	HU104
---	2	3	3	Fundamentals of Economics and Feasibility Study	HU105
---	2	3	3	Group Dynamics and Communication	HU106
---	2	3	3	Communication and Negotiation Skills	HU107
---	2	3	3	Creative Thinking	HU108

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
---	2	4	4	Mathematics	BS100
---	2	4	4	Electronic Physics	BS101
---	4	2	4	Programming Fundamentals	CS100
CS100	4	2	4	Object-Oriented Paradigm	CS101
BS100	2	4	4	Discrete Structure	CS102
CS100	2	3	3	IS Fundamentals	IS100
CS101	4	2	4	Data Structures and Algorithms	CS200
---	2	4	4	Operations Research	DS200
CS102	2	3	3	Computer Architecture	IT200
CS102	3	3	4	Multimedia and Computer Graphics	IT201
IS100	2	3	3	System Analysis and Design	IS200
BS100	2	4	4	Statistics and Empirical Methods for Computing	BS200
IT200	2	3	3	Operating Systems	CS300
BS200 DS200	2	4	4	Modeling and Simulation	DS300
CS102 CS200	3	3	4	Database Concepts	IS300
CS300	3	3	4	Computer Networks	IT300
CS102 CS200	3	3	4	Artificial Intelligence	CS301

متطلبات التخصص

54 ساعة معتمدة (36 ساعة اجباري + 18 ساعة اختياري)

المتطلبات الاجبارية (36 ساعة معتمدة)

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
IS100	3	4	4	GIS Fundamentals	GIS200
IS100	2	3	3	Introduction to RS	GIS201
GIS200	2	3	3	Spatial Data Acquisition Techniques	GIS300
IS300 GIS200	2	3	3	Geodatabase Management System	GIS301
CS100 GIS200	2	3	3	GIS Programming and Customization	GIS302
IT201 GIS200	2	3	3	Digital Cartography and Visualization	GIS303
BS200 DS300 GIS200	2	3	3	Spatial Analysis and Modeling	GIS304
IT300 GIS200	2	3	3	Web-Based GIS	GIS401
GIS301 GIS200	2	3	3	GIS Management and Implementation	GIS402
---	8	4	8	GIS Project	GIS400

المقررات الاختيارية للتخصص (Electives)
18 ساعة معتمدة

المتطلب السابق	تمارين / عملي	محاضرة	عدد الساعات المعتمدة	اسم المقرر	رقم المقرر
GIS301	2	3	3	Spatial Data Mining	GIS403
GIS304	2	3	3	Geocomputation	GIS404
GIS304	2	3	3	GIS Network Modeling	GIS405
GIS304	2	3	3	Geomatics and Digital terrain modeling	GIS406
GIS304	2	3	3	GIS-based locational Modeling	GIS407
GIS304	2	3	3	GIS-based Environmental modeling	GIS408
GIS302	2	3	3	Spatial Decision Support Systems	GIS409
GIS201	2	3	3	Digital Remote Sensing	GIS410
GIS201	2	3	3	Radar Remote Sensing	GIS411
GIS201	2	3	3	3D Data Capture and Ground LIDAR	GIS412
GIS201	2	3	3	Applied Remote Sensing	GIS413
GIS300	2	3	3	Global Positioning System Satellite Surveying Techniques	GIS414
GIS304	2	3	3	Urban and Environmental Applications of GIS/Remote Sensing	GIS415

HU100 English Language:

اللغة الإنجليزية

The material reflects the stylistic variety that advanced learners have to be able to deal with. The course gives practice in specific points of grammar to consolidate and extend learners existing knowledge.

HU101 Report Writing and Presentation skills

كتابة التقارير و مهارات العرض

This course introduces Basic rudiments of report writing. The rationale for report writing, the structure of reports, physical appearance and linguistic style. In addition to writing reports, students will also be given supplementary exercises, as necessary, to enhance their general writing skills. Recent correlated software packages should be used through labs.

HU200 Human Rights and IT Ethics:

حقوق الإنسان وأخلاقيات المهنة

The course is intended to provide an increased understanding of how human rights and ethical issues present themselves in discussions of population policies and programs as well as how the science of demography is affected by human rights and ethical considerations. The course will begin with a brief review of demographic processes and methods, the human rights field, and basic modes of ethical thought. After this introduction, the course will give equal attention to four largely distinct areas:(1) the human rights consequences and the ethical foundations and implications of various substantive demographic policies and programs and, related to this, the impact of human rights, or their restriction, on demographic behaviors;(2) the human rights consequences of demographic research and methods and related issues of research ethics;(3) the impact of human rights, or their restriction, on demographic research; and(4) the use of demographic research and methods in support of human rights.

HU103 Organizational Behavior

السلوك التنظيمي

Perception, learning, motivation and value; individual differences and work performance; understanding yourself; motivating yourself and others, working within groups, achieving success through goal setting, achieving high personal productivity and quality; achieving rewarding and satisfying career; communicating with people; leading and influencing others; building relationships with supervisors, co-worker and customers. Recent correlated software packages should be used through labs.

HU 104 Fundamentals of Management

أساسيات الإدارة

Introduction to management science, principals of organization structures and their categories, inventory models, analysis cost volume profit, objectives and methodologies of resource

management, skills needed to effective management renewable and natural resources. Decision making processes and financial management, accounting management, marketing, and human resource management. Recent correlated software packages should be used through labs.

HU105 Fundamentals of Economics and Feasibility Studies

<div dir="rtl">

أساسيات الإقتصاد ودراسات الجدوى

</div>

Concepts of economics. The economic problem. Supply and demand. Theory of demand including utility theory, theory of production, theory of cost, theory of firm including pricing theory, economics of education, economic of science and technology, economics of automation including computerization. Recent correlated software packages should be used through labs.

HU106 Group Dynamics and Communication

<div dir="rtl">

ديناميكيات الاتصال

</div>

Essentials of oral, written, and graphical communication for software engineers. Principles of technical writing; types of documents and strategies for gathering information and writing documents, including presentations. Appropriate use of tables, graphics, and references. How to be convincing and how to express rationale for one's decisions or conclusions. Basics of how to work effectively with others; notion of what motivates people; concepts of group dynamics. Principles of effective oral communication, both at the interpersonal level and when making presentations to groups. Strategies for listening, persuasion, and negotiation. The course also includes Write clear, concise, and accurate technical documents following well-defined standards for format and for including appropriate tables, figures, and references. Review written technical documentation to detect problems of various kinds. Develop and deliver a good quality formal presentation. Negotiate basic agreements with peers. Participate in interactions with others in which they are able to get their point across, and are also able to listen to and appreciate the points of others, even when they disagree, and are able to convey to others that they have listened.

HU107 Communication and Negotiation Skills

<div dir="rtl">

مهارات التفاوض والاتصال

</div>

The goal is to become knowledgeable of the Integrated and Collaborative Engagement Process and the theory and practice of effective relationship building by developing a critical thinking process that creates an understanding of diverse constructions of reality shared by individuals and groups in any setting. Effective Business Communication, Communicating in Teams & Business Etiquette, Communicating Intercultural, Planning Business Messages, Writing Business Messages, Completing Business Messages, Writing Routine Messages, Writing Bad News Messages Writing Persuasive Messages, Planning Business Reports, Writing Business Reports, Completing Business Reports, Oral Presentations, Writing Resumes and Application Letters, Interviewing for Employment, and Negotiation Skills book

HU108 Creative Thinking

<div dir="rtl">

التفكير الابداعي

</div>

Describe nature of business, role of accounting, and accounting equation. Analyze Transaction and understand rules of debit and credit. Describe adjustment process and prepare

adjusted trial balance. Describe seven basic steps of a/c cycle, prepare work sheet, and financial statements. (This fulfills SCANS Basic Skill Competencies. Describe accounting system, objectives of internal control, and subsidiary ledgers & special journals. Describe accounting for merchandising business. Describe cash and bank reconciliation. (This fulfills SCANS Basic Skill Competencies.Describe the nature and characteristics of receivables. (This fulfills SCANS Basic Skill Competencies .Describe inventory costing methods using FIFO, LIFO, & Average Cost. Describe fixed assets and intangible assets, and compute depreciation. Describe current liabilities and contingent liabilities.

BS100 Mathematics

الرياضيات

Limits and continuity, differentiation, trigonometric functions; applications of differentiation; integration; techniques of integration; application of integration. Indeterminate forms; Taylor's formula and improper integrals; Infinite series; Fourier series and Fourier integral; parametric curves and vectors in the plane; vectors, curves and surfaces in space; binomial theorem; partial fraction; partial differentiation. Matrices and operation; homogenizes and no homogenizes liner equation; determinants; vector spaces and sub spaces. Special functions; partial deferential equations; numerical analysis; complex variables; applications. Recent correlated software packages should be used through labs.

BS101 Electronic Physics

فيزياء الاليكترونيات

Electrical sources, electrical circuit elements, Ohm's law, Kirshoffs laws, solution of AC circuits, superposition theorem, substitution theorem, Thevenin's and Norton's theorems, compensation theorem, four-pole networks, electric power, maximum power transfer theorem, diodes, transistors, field effect transistors, operational amplifiers and their basic circuits and applications. Recent correlated software packages should be used through labs.

CS100 Programming Fundamentals

أساسيات البرمجة

Introduces the fundamental concepts of procedural programming. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging. The course also offers an introduction to the historical and social context of computing and an overview of computer science as a discipline. The course also includes Fundamental programming constructs: Syntax and semantics of a higher-level language; variables, types, expressions, and assignment; simple I/O; conditional and iterative control structures; functions and parameter passing; structured decomposition. Algorithms and problem-solving: Problem-solving strategies; the role of algorithms in the problem-solving process; implementation strategies for algorithms; debugging strategies; the concept and properties of algorithms.

CS101 Object-Oriented Paradigm

البرمجة الموجهة

Introduces the concepts of object-oriented programming to students with a background in the procedural paradigm. The course begins with a review of control structures and data types with emphasis on structured data types and array processing. It then moves on to introduce the object-oriented programming paradigm, focusing on the definition and use of classes along with the fundamentals of object-oriented design. Other topics include an overview of programming language principles, simple analysis of algorithms, basic searching and sorting techniques, and an introduction to software engineering issues. The course also includes Review of control structures, functions, and primitive data types. Object-oriented programming: Object-oriented design; encapsulation and information hiding; separation of behavior and implementation; classes, subclasses, and inheritance; polymorphism; class

hierarchies. Fundamental computing algorithms: simple searching and sorting algorithms (linear and binary search, selection and insertion sort). Fundamentals of event-driven programming; Introduction to computer graphics: Using a simple graphics API; Overview of programming languages: History of programming languages; brief survey of programming paradigms

CS102 Discrete Structures

<div dir="rtl">

التركيبات الغير متصلة

</div>

Introduces the foundations of discrete mathematics as they apply to computer science, focusing on providing a solid theoretical foundation for further work. Topics include functions, relations, sets, simple proof techniques, Boolean algebra, propositional logic, digital logic, elementary number theory, and the fundamentals of counting. The course also includes Introduction to logic and proofs: Direct proofs; proof by contradiction; mathematical induction. Fundamental structures: Functions (surjections, injections, inverses, composition); relations (reflexivity, symmetry, transitivity, equivalence relations); sets (Venn diagrams, complements, Cartesian products, power sets); pigeonhole principle; cardinality and countability. Boolean algebra: Boolean values; standard operations on Boolean values; de Morgan's laws. Propositional logic: Logical connectives; truth tables; normal forms (conjunctive and disjunctive); validity. Digital logic: Logic gates, flip-flops, counters; circuit minimization. Elementary number theory: Factorability; properties of primes; greatest common divisors and least common multiples; Euclid's algorithm; modular arithmetic; the Chinese Remainder Theorem. The course also includes Predicate logic: Universal and existential quantification; modus ponens and modus tollens; limitations of predicate logic. Recurrence relations: Basic formulae; elementary solution techniques. Graphs and trees: Fundamental definitions; simple algorithms; traversal strategies; proof techniques; spanning trees; applications. Matrices: Basic properties; applications.

IS100 Information Systems Fundamentals

<div dir="rtl">

أساسيات نظم المعلومات

</div>

Fundamental concepts, objective of information system, system definition, subsystem definition, message passing in information system, message levels data, information, knowledge, needs, characteristics, sources, data processing (DP), electronic data processing (EDP), management information system (MIS), economics of information systems, decision support system (DSS), office automation system (OAS), executive information system (IS), expert system (ES), computer based information system (CBIS), type of CBIS, relationships among CBISs, the evolutionary view, the hierarchical view, the contingency view, the importance of CBIS, the nature of information system in different organization. Management concepts in CBIS, data management, the organization of data, application oriented files, database approach, decision-making concepts and tools, decision support system (DSS), building a DSS, application of DSS, evaluation of information systems. Recent correlated software packages should be used through labs.

CS200 Data Structures and Algorithms

هياكل البيانات و الخوارزميات

Introduce the fundamental concepts of data structures and the algorithms. Topics include recursion, the underlying philosophy of object-oriented programming, fundamental data structures (including stacks, queues, linked lists, hash tables, trees, and graphs), the basics of algorithmic analysis, and an introduction to the principles of language translation. The course also includes Review of elementary programming concepts. Fundamental data structures: Stacks; queues; linked lists; hash tables; trees; graphs. Object-oriented programming: Object-oriented design; encapsulation and information hiding; classes; separation of behavior and implementation; class hierarchies; inheritance; polymorphism. Fundamental computing algorithms: O(N log N) sorting algorithms; hash tables, including collision-avoidance strategies; binary search trees; representations of graphs; depth- and breadth-first traversals. Recursion: The concept of recursion; recursive mathematical functions; simple recursive procedures; divide-and-conquer strategies; recursive backtracking; implementation of recursion. Basic algorithmic analysis: Asymptotic analysis of upper and average complexity bounds; identifying differences among best, average, and worst case behaviors; big "O," little "o," omega, and theta notation; standard complexity classes; empirical measurements of performance; time and space tradeoffs in algorithms; using recurrence relations to analyze recursive algorithms. Algorithmic strategies: Brute-force algorithms; greedy algorithms; divide-and-conquer; backtracking; branch-and-bound; heuristics; pattern matching and string/text algorithms; numerical approximation algorithms

DS200 Operations Research

بحوث العمليات

This course is an introduction to the use of quantitative methods in business decision-making. Topics include linear programming, decision making under certainty, forecasting, queuing, and inventory systems. Recent correlated software packages should be used through labs.

IT200 Computer Architectures

معمارية الحاسب

An introduction to computer architecture. Includes a survey of computer architecture fundamentals exemplified in commercially available computer systems, including classical CPU and control unit design, register organization, primary memory organization and access, internal and external bus structures, and virtual memory schemes. Alternatives to classical machine architecture, such as the stack machine and the associative processor, are defined and compared. Parallel processors and distributed systems are also presented, along with an analysis of their performance relative to nonparallel machines. Recent correlated software packages should be used through labs.

IT201 Multimedia and Computer Graphics

الوسائط المتعددة و الرسم بالحاسب

This course examines one or more selected current issues in the area of image synthesis. Specific topics covered are dependent on the instructor. Potential

topics include: scientific visualization, computational geometry, photo-realistic image rendering and computer animation, Organization and structure of modem multimedia systems; audio and video encoding. Quality of service concepts; Screen resolution and screen technology, video accelerator design system, raster graphics (3D- transformation), analog- to-digital conversion, video compression, mixing and displaying at 30 FPS with full color capacity. Recent correlated software packages should be used through labs.

IS200 Systems Analysis and Design

<div dir="rtl">

تحليل وتصميم النظم

</div>

Fundamental concepts, system definition, information systems building blocks, information systems development, systems analysis, requirement discovery, data modelling and analysis, process modelling, object-oriented analysis and modelling, feasibility analysis and system proposal. Lab works using CASE tool. Recent correlated software packages should be used through labs.

BS200 Statistics and Empirical Methods for Computing

<div dir="rtl">

الإحصاء والطرق التجريبية للحاسبات

</div>

Principles of discrete probability with applications to computing. Basics of descriptive statistics. Distributions, including normal (Gaussian), binomial and Poisson. Least squared concept, correlation and regression. Statistical tests most useful to software engineering: t-test, ANOVA and chi-squared. Design of experiments and testing of hypotheses. Statistical analysis of data from a variety of sources. Applications of statistics to performance analysis, reliability engineering, usability engineering, cost estimation, as well as process control evaluation.

CS300 Operating Systems

<div dir="rtl">

نظم التشغيل

</div>

This course will provide an introduction to operating system design and implementation. The course will start with a brief historical perspective of the evolution of operating systems over the last fifty years, and then cover the major components of most operating systems. This will include: Computer system structures, Operating system structures, Process and Process management: process synchronization and mutual exclusion; two- process solution and Dekker's algorithm, semaphores (producer- consumer, readers-writer, dining philosophers, etc), Interprocess communication, Process synchronization, Deadlocks, thread management, CPU scheduling: multiprogramming and time-sharing, scheduling approaches (SJF, FIFO, round robin, etc), Memory hierarchy and management: with and without swapping, virtual memory-paging and segmentation, page replacement algorithms, implementation., Virtual memory, Secondary storage management, I/O device management , File system: interface and implementation, FS services, disk space management, directory and data structure, Protection and security, and Case studies: Linux and Windows. Recent correlated software packages should be used through labs.

DS300 Modeling and Simulation

<div dir="rtl">

النمذجه والمحاكاة

</div>

Basic simulation modeling, nature of simulation. system models & simulation, discrete event

simulation, simulation of a single-server queuing system, simulation of an inventory system, list processing in simulation, simulation languages, simulation of time sharing systems, simulation output data and stochastic processes, building valid and credible simulation models, principles of valid simulation modeling, verification of simulation computer programs, an approach for developing valid &credible simulation models, statistical procedures for computing real-world observation & simulation output data, some practical considerations: selecting input probability distributions, random number generators, generating random variables, output data analysis for a single system. Recent correlated software packages should be used through labs.

IS300 Database Concepts

مفاهيم قواعد البيانات

File organization and record storage; heap, sorted, and index files including B-trees and disk based hashing algorithms; entity relationship model, relational model, relational languages; database normalization; implementation of heap files and indexing techniques. Other topics include database modelling, operations in the relational model, database language SQL, constraints in SQL, system aspects of SQL. Lab works using Oracle. Recent correlated software packages should be used through labs.

IT300 Computer Networks

شبكات الحاسب

The principles and practice of computer networking, with emphasis on the Internet. The structure and components of computer networks, packet switching, layered architectures, OSI 7 layer model, TCP/IP, physical layer, error control, window flow control, local area networks (Ethernet, Token Ring; FDDI), network layer, congestion control, quality of service, multicast. Recent correlated software packages should be used through labs.

CS301 Artificial Intelligence

الذكاء الإصطناعي

This is an introductory AI course. Topics will include Artificial and human intelligence, Overview of Artificial Intelligence, Basic Problem-Solving Strategies, Heuristic Search, Problem Reduction and AND/OR Graphs, domains of AI- symbolic processing: semantic nets, modeling model based reasoning, frames. Knowledge Representation, Representing Knowledge with If-Then Rules. Inference Engines, Inference techniques: implication, forward and backward chaining, inference nets, predicate logic, quantifiers, tautology, resolution, and unification. Rule based systems: inference engine, production systems, problem solving, planning, decomposition, and basic search techniques. AI languages: symbolic and coupled processing prolog: objects and relations, compound goals, backtracking, search mechanism, dynamic databases, lisp, program structure and operations, functions, unification, memory models. Fields of AI: heuristics and game plying, automated reasoning, problem solving, computational linguistics and natural language processing, computer vision, intelligent agents, robotics AI based computer systems: sequential and parallel inference machines, relation between AI and artificial neural nets, fuzzy systems. Recent correlated software packages should be used through labs.

GIS200 Geographic Information Systems Fundamentals

<div dir="rtl">

مبادئ نظم المعلومات الجغرافية

</div>

Provides an introduction to Geographic Information Systems and their applications. Emphasizes the concepts needed to use GIS effectively for manipulating, querying, analyzing, and visualizing spatial-based data. Industry-standard GIS software is used to analyze spatial patterns in social, economic and environmental data, and to generate cartographic output from the analysis. Recent correlated software packages should be used through labs.

GIS201 Introduction to Remote Sensing

<div dir="rtl">

مبادئ الإستشعار عن بعد

</div>

Basic principles of photogrammetry: stereoscopy, camera geometry. Aerial photography: cameras, calibration, flight planning. Introduction to analytical plotting methods and orientation procedures. Physical bases of remote sensing: electromagnetic radiation; basic laws of electromagnetic radiation; absorption, reflection and emission; atmospheric effects; radiation interactions with the surface; spatial resolution; temporal resolution. Trends in remote sensing: major satellite remote sensing programmes; operational systems; funding sources; commercialisation; science and applications development. Recent correlated software packages should be used through labs.

GIS300 Spatial Data Acquisition Techniques

<div dir="rtl">

تقنيات جمع البيانات الجغرافية

</div>

This course introduces methods of surveying field collection of data in a manner suitable for spatial analysis. Topics will include plane and topographic surveying, use of the levels, total stations, and the Global Positioning System (GPS), preparation of data for conversion to a digital format, map generation from surveying field data, accuracy, and quality of spatial data. The course has a main field and laboratory components. Recent correlated software packages should be used through labs.

GIS301 GeoDatabase Management System

<div dir="rtl">

نظم ادارة قواعد البيانات الجغرافية

</div>

The goal of this course is to introduce the main features of spatial databases, the kernel of Geographic Information Systems (GIS). Topics include: spatial concepts and data models, spatial query languages, spatial storage and indexing, query processing and optimization, spatial networks, introduction to spatial data mining. Exercises and practical work will be concentrated on building and designing geodatabases. Recent correlated software packages should be used through labs.

GIS302 GIS Programming and Customization

<div dir="rtl">

برمجة نظم المعلومات الجغرافية

</div>

Students learn to use the Visual Basic for Applications (VBA) programming environment to add functionality to ArcGIS. Students who successfully complete the course are able to automate repetitive tasks, customize the ArcGIS interface, and share their customizations with others. Recent correlated software packages should be used through labs.

GIS303 Digital Cartography and Visualization

<div dir="rtl">

الكارتوجرافيا الرقمية والتجسيد المرئى

</div>

An overview of the development of Cartography, the concepts, processes, techniques and data sources. The role of Cartography in digital mapping and Geographic Information Systems. Rules of graphical communication and the depiction of spatial data. The Cartographic process: need, data sources, evaluation, scale, reference base, projection, design specifications, compilation, production and final output. Graphical elements of design and symbolisation. Applications of the representation of spatially referenced data in the areas of sociological, economical, topographical and environmental The traditional and digital approaches to cartographic design, production methods and user/supplier requirements. Evaluation of the cartographic processes for applicability. The functionality of digital mapping programs and the cartographic software of Geographical Information Systems. The cognitive processes of spatial data capture and the present methods of data visualisation. Knowledge based map design techniques. Multimedia and virtual reality as visualisation techniques. Recent correlated software packages should be used through labs.

GIS304 Spatial Analyses and Modeling

<div dir="rtl">

التحليل والنمذجة المكانية

</div>

This course explores methods of analyzing spatial data in the interactive and graphical environment of a GIS. The course draws on related theory in spatial statistics, geo-statistics, geographical analysis and cartographic modeling to provide a set of generic techniques for GIS users. Topics include the analysis of point patterns, networks, overlay analysis, spatial interaction models, and visualization of spatial data (virtual reality, simulation of landscape, animation, multi-media). The course concludes by considering how to extend the spatial analytical capabilities of GIS and points to the evolution of spatial decision support systems. Associated exercises and hands-on allow methods to be applied in a GIS context. Recent correlated software packages should be used through labs.

GIS401 Web-based GIS

<div dir="rtl">

نظم المعلومات الجغرافية الشبكية

</div>

Provides a conceptual overview and hands-on experiences in Internet mapping and web-based geospatial information processing with state-of-the-art commercial software. Topics covered included client/server configuration, distributed data access and display, web-based user interaction and customization. Recent correlated software packages should be used through labs.

GIS402 GIS Management and Implementation

<div dir="rtl">

إدارة وتنفيذ نظم المعلومات الجغرافية

</div>

Management strategies for GIS are examined by presenting GIS as an integrated system of people, computer hardware, software, applications and data. Implementation is examined as a systematic process of user needs assessment, system specification, database design, application development, implementation, operation, and maintenance. Includes design of implementation plans as case studies to explore various techniques associated with each step of this process. Recent correlated software packages should be used through labs.

GIS400 GIS Project

<div dir="rtl">

المشروع

</div>

This course will continue for two semesters. In the first semester, a group of students will select one of the projects proposed by the department, and analyze the underlying problem. In the second semester, the design and implementation of the project will be conducted.

GIS403 Spatial Data Mining

إستخلاص البيانات الجغرافية

Spatial data mining is the branch of data mining that deals with spatial (location) data. This course focuses on algorithm techniques that can be used for spatial data mining tasks such as classification, association rule mining, clustering, and numerical prediction. This includes probabilistic and statistical methods, genetic algorithms and neural networks, visualization techniques, and mathematical programming. We also place such data mining within the larger picture of knowledge discovery in databases and in particular its relationship with data warehousing. We will consider numerous case studies from different application areas such as remote sensing, ecology, weather, natural disasters, public health, transportation, and criminal analysis. Recent correlated software packages should be used through labs.

GIS404 Geocomputation

الحسابات الجغرافية

The increasing volume and complexity of available digital geographic data overwhelms traditional analytical modeling methods. Alternatively, we can exploit the increasing power of computational environments to analyze geographic phenomena with a minimum of simplifying assumptions. This course is a high-level introduction to the use of computational intelligence methods for exploring, analyzing, modeling and simulating geographic phenomena. Techniques discussed include heuristic search in spatial optimization, pattern recognition and machine learning techniques and simulating complex spatio-temporal systems. Recent correlated software packages should be used through labs.

GIS405 GIS Network Modeling

نمذجة الشبكات باستخدام نظم المعلومات الجغرافية

Examines the theory of network analysis and its application in Geographic Information Systems. Topics covered include graph theoretic measures of network connectivity and proofs of network properties; optimization problems including shortest path algorithms, flow algorithms, and assignment problems on networks; special solution procedures for the classic transportation problem; procedures for linear referencing and urban travel demand modeling. The implementation of these algorithms and procedures with GIS data structures is explored using industry standard GIS software. Recent correlated software packages should be used through labs.

GIS406 Geometrics and Digital terrain modelling

نمذجة التضاريس

This course introduces the technical aspects of Geomatics, including digital terrain modeling, photogrammetry and geodesy. Although the use of remotely sensed data within these fields is emphasized, aspects of ground-based measurement will also be reviewed. Case studies are used to illustrate the techniques described. The course begins by considering the use of satellite positioning for geodesy, surveying and navigation (Global Positioning Systems). The

course continues by examining the use of remote sensing data, from aircraft and satellites, for measuring spatial properties of the earth, using a range of data sources such as photographs, optical scanners, radar imagers and lidar. A discussion of radar interferometry for determining ground elevation and centimetre-scale ground displacements is included. Recent correlated software packages should be used through labs.

GIS407 GIS-based locational Modeling

نمذجة الاماكن باستخدام نظم المعلومات الجغرافية

This course considers certain locational problems which are of interest to public and private sector decision-makers and ways of modeling them viewed in a GIS context. Location/allocation models are typically concerned with locating supply points for a public-sector service (e.g. health/recreation centres or fire stations). To give the best possible access to the population served. Spatial interaction models have been used to estimate various flows and their impact on the urban system. Other problems discussed include Electoral Districting and the identification of significant Clusters (in an epidemiological context). This course requires some computer programming experience. Recent correlated software packages should be used through labs.

GIS408 GIS-based Environmental Modeling

النمذجة البيئية باستخدام نظم المعلومات الجغرافية

This course provides an introduction to the theory and practical application of modeling environmental systems and their integration with GIS technologies. Emphasis will be placed on the variety of approaches to modeling, their characteristics and limitations. Case studies will be used to illustrate these approaches and to demonstrate shared principles and practices over a variety of natural systems. The links between models and GIS within the context of data structures, spatial analysis, and visualization will be stressed. Practical and individual project work will focus on the requirements for the design and implementation of models. Recent correlated software packages should be used through labs.

GIS409 GIS-Based Spatial Decision Support Systems

نظم دعم القرارات الجغرافية

This course introduces students to key theories, concepts and techniques that have been developed recently to improve the decision support capabilities of spatial information systems. Topics covered include participatory GIS, group-based spatial decision support systems, and the integration of multi-criteria analysis (MCA) methods with GIS to facilitate decision making in planning. Recent correlated software packages should be used through labs.

GIS410 Digital Remote Sensing

الإستشعار عن بعد الرقمى

Techniques of image processing and analysis for remotely sensed digital data. Topics include radiometric correction, geometric correction, atmospheric and ground effects, image enhancement, spectral analysis, colour processing, math operation, image filtering, Hyper-spectroscopy and imaging spectroscopy, noise suppression, image classification, post-

classification and change detection, practical exercises based on satellite datasets and other forms of remotely sensed data. The course develops and expands topics in the area of image processing as a necessary pre-requisite to advanced studies in remote sensing. Hands-on and lab exercises complement the course. Recent correlated software packages should be used through labs.

GIS411 Radar Remote Sensing

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الاستشعار عن بعد الراداري

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Principles and applications of orbital and airborne radar remote sensing, including real and synthetic aperture radar systems. Principles of Radargrammetry and single-path and repeat-path interferometry. Applications of radar remote sensing in geosciences, land use and land cover mapping, forestry and agriculture, urban analysis. Recent correlated software packages should be used through labs.

GIS412 3D Data Capture and Ground LIDAR

<div dir="rtl">

تجميع البيانات باستخدام نظم الاستشعار عن بعد

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The use of reflectorless lasers is rapidly expanding in many activities including geosciences, GIS, engineering, surveying, architecture, facility and utility management.This course will cover the basics, advances and applications of ground reflectorless laser scanners for capturing the 3D man made and natural features. An emphasis will be the acquisition and utilization of point clouds from high data rate fast scanners ("ground LIDAR") and their unique requirements and problems . These data will be integrated with GPS and other sensors such as cameras. We will review case histories and carry out a variety of applications depending on the interests of the class. 3D visualization and analysis of such data sets will be covered. Recent correlated software packages should be used through labs.

GIS413 Applied Remote Sensing

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تطبيقات الاستشعار عن بعد

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Focuses on the application of remote sensing techniques to solving real world urban and environmental problems in areas such as urban and suburban landscape, lane use and land cover, transportation and communication, vegetation and forestry, biodiversity and ecology, water and water quality control, soils and minerals, geology and geomorphology studies. The current generation, industry standard software is used for labs and applications development. Recent correlated software packages should be used through labs.

GIS14 Global Positioning System Satellite Surveying Techniques

<div dir="rtl">

تحديد المواقع باستخدام الاقمار الصناعية

</div>

The theory and application of satellite positioning utilizing the Global Positioning System Code and phase methodology in field observations, data processing and analysis of Differential GPS, high accuracy static and other rapid measurements, in real time and with post-processing. Recent correlated software packages should be used through labs.

GIS415 Urban and Environmental Applications of GIS/Remote Sensing

التطبيقات البيئية و المدنية لنظم المعلومات الجغرافية و الاستشعار عن بعد

This course focuses on the application of remote sensing and GIS techniques to solving real-world urban and environmental problems. Applications may include analyses of urban and suburban landscape, land use and land cover, and communication, vegetation and forestry, biodiversity and ecology, water and water quality control, soils and minerals, geology and geomorphology, etc. Recent correlated software packages should be used through labs.

GIS Program

Year one		Year two		Year three		Year four	
Semester A							
Code	**Subject**	**Code**	**Subject**	**Code**	**Subject**	**Code**	**Subject**
CS100	Programming Fundamentals	CS200	Data Structures and Algorithms	CS300	Operating Systems	GIS400	GIS Project
BS100	Mathematics	DS200	Operations Research	DS300	Modeling and Simulation	GIS401	Web-Based GIS
HU100	English	GIS200	GIS Fundamentals	IS300	Database Concepts	GIS402	GIS Management and Implementation
BS101	Electronic Physics	GIS201	Introduction to RS	CS301	Artificial Intelligence		GIS Elective (1)
	Humanities Elective(1)		Humanities Elective(3)	GIS300	Spatial Data Acquisition Techniques		GIS Elective (2)
Semester B							
Code	**Subject**	**Code**	**Subject**	**Code**	**Subject**	**Code**	**Subject**
CS101	Object-Oriented Paradigm	IT200	Computer Architecture	GIS301	Geodatabase Management System	GIS400	GIS Project
IS100	IS Fundamentals	IS200	System Analysis and Design	IT300	Computer Networks		GIS Elective (3)
CS102	Discrete Structure	HU200	Human Rights and IT Ethics	GIS302	GIS Programming and Customization		GIS Elective (41)
HU101	Report Writing and Presentation Skills	IT201	Multimedia and Computer Graphics	GIS303	Digital Cartography and Visualization		GIS Elective (5)
	Humanities Elective(2)	BS200	Statistics and Empirical Methods for Computing	GIS304	Spatial Analysis and Modeling		GIS Elective (6)

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PDCS	علوم الحاسب	1
PDIT	تكنولوجيا المعلومات	2
PDIS	نظم المعلومات	3
PDDS	دعم القرار	4

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Core Courses

First Semester			Credit point	lecture	lab
PDBS	101	Discrete Mathematics	3	3	2
PDIS	102	Computer Skills For Personal Productivity	3	3	2
PDCS	103	Digital Logic Design	3	3	2
PDCS	104	Programming Fundamentals	3	3	2
PDIS	105	Information System Fundamental	3	3	2

Second Semester

PDCS	201	Algorithms and Data Structures	3	3	2
PDCS	202	Computer Architecture and Operating Systems	3	3	2
PDIS	203	System Analysis and Design	3	3	2
PDDS	204	Operations Research	3	3	2
PDBS	205	Applied Probability and Statistics	3	3	2

Third Semester

PDIT	301	Computer Networks	3	3	2
PDCS	302	Artificial Intelligence	3	3	2
PDIS	303	Database Management Systems	3	3	2
PDCS	304	Object Oriented Programming	3	3	2
PDIS	305	GIS Fundamentals	3	3	2

PD	400	Project.	5	2	4
PDIS	401	Object Oriented System analysis and design	3	3	2
PDIS	402	Object Oriented Database	3	3	2
PDIS	403	Multimedia Information System	3	3	2
PDIS	404	Spatial Data Acquisition Techniques	3	3	2
PDIS	405	Geodatabase Design	3	3	2
PDIS	406	Spatial Analysis and Modeling	3	3	2
PDIS	407	GIS Programming and Customization	3	3	2
PDIS	408	E-Commerce	3	3	2
PDIS	409	E-Business System Strategy	3	3	2
PDIS	410	Expert Systems	3	3	2
PDIT	411	Internet Technologies and Programming	3	3	2
PDIT	412	Wireless and Mobile Networks	3	3	2
PDIT	413	Network Security	3	3	2
PDIT	414	Computer Graphics and Animation	3	3	2
PDIT	415	Multimedia Systems	3	3	2
PDIT	416	Virtual Reality	3	3	2
PDIT	417	Digital Image Processing	3	3	2
PDDS	418	Computerized Project Management	3	3	2
PDDS	419	Modeling and Simulation	3	3	2
PDDS	420	Crisis Management	3	3	2
PDDS	421	Decision Making Theory and Techniques	3	3	2
PDDS	422	Optimization techniques	3	3	2
PDDS	423	Inventory Control and Production Management	3	3	2
PDDS	424	Total Quality Management	3	3	2

المحتوى العلمي
Core Courses

First Semester

PDBS 101 - Discrete Mathematics.

الرياضيات غير المتصلة

Functions, relations and sets, cardinality connectives, truth tables, normal forms, universal proof techniques: Implications, converse, inverse, direct proof, proof by counter example, contraposition, and contradiction mathematical Induction, graphs and trees: Undirected graphs, directed graphs, trees, spanning trees. Goops: Basic algebra in groups, cyclic groups. Recent correlated software packages should be used through labs.

PDIS 102 - Computer Skills For Personal Productivity.

مهارات الكمبيوتر للإنتاجية

This course covers basic computer tools for personal productivity beyond an introductory level. Topics include computer files, word processing, spreadsheets, databases, presentation software, and accessing electronic information. The objective is to prepare a student for the International Computer Driving License (ICDL) Examination. Recent correlated software packages should be used through labs.

PDCS 103 - Digital Logic Design.

التصميم المنطقي

Numbering systems, logic functions and logic gates. Boolean algebra. Combinational circuits: Simplification of logic circuits using Karnaugh maps and tabulation method. Gate level design, adders, subtracters, encoders and decoders, multiplexers and demultiplexers. MSI Design, Programmable devices (ROM, PAL, PLA,....). Sequential circuits: Flip-flops, latches, analysis and design of simple sequential circuits, state tables and state diagrams, counters, registers, RAMs. Integrated circuits and logic families. Recent correlated software packages should be used through labs.

PDCS 104 - Programming Fundamentals

أساسيات البرمجة

Introduces the fundamental concepts of procedural programming. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging. The course also offers an introduction to the historical and social context of computing and an overview of computer science as a discipline. The course also includes Fundamental programming constructs: Syntax and semantics of a higher-level language; variables, types, expressions, and assignment; simple I/O; conditional and iterative control structures; functions and parameter passing; structured decomposition. Algorithms and problem-solving: Problem-solving strategies; the role of algorithms in the problem-solving process; implementation strategies for algorithms; debugging strategies; the concept and properties of algorithms.

PDIS 105 - Information System Fundamental.

<div dir="rtl">أساسيات نظم المعلومات</div>

Fundamental concepts, objective of information system, system definition, subsystem definition, message passing in information system, message levels data, information, knowledge, needs, characteristics, sources, data processing (DP), electronic data processing (EDP), management information system (MIS), economics of information systems, decision support system (DSS), office automation system (OAS), executive information system (IS), expert system (ES), computer based information system (CBIS), type of CBIS, relationships among CBISs, the evolutionary view, the hierarchical view, the contingency view, the importance of CBIS, the nature of information system in different organization. Management concepts in CBIS, data management, the organization of data, application oriented files, database approach, decision-making concepts and tools, decision support system (DSS), building a DSS, application of DSS, evaluation of information systems. Recent correlated software packages should be used through labs.

Second Semester

PDCS 201 - Algorithms and Data Structures.

<div dir="rtl">خوارزميات و هياكل البيانات</div>

An introduction to the design and analysis of algorithms. The course covers design techniques, such as dynamic programming and greedy methods, as well as fundamentals of analyzing algorithms for correctness and time and space bounds. Topics include advanced sorting and searching methods, graph algorithms and geometric algorithms, notion of an algorithm: big-O, small-O, theta and omega notations. Space and time complexities of an algorithm. Specification, representation, and manipulation of basic data structures: linked lists, arrays, stacks, queues, trees, strings, symbol tables, Huffman codes, optimal search trees, pattern matching, priority queues, heaps, hash tables. List and string processing languages. Analysis of algorithms. Performance evaluation involving worst case, average and expected case, and amortized analysis. Students are required to write programs in several languages such as C++, C#, Java, or Pascal. Recent correlated software packages should be used through labs.

PDCS 202 - Computer Architecture and Operating Systems.

<div dir="rtl">معمارية الحاسب ونظم التشغيل</div>

An introduction to computer architecture and Operating systems . Includes a survey of computer architecture fundamentals exemplified in commercially available computer systems, including classical CPU and control unit design, register organization, primary memory organization and access, internal and external bus structures, and virtual memory schemes. Alternatives to classical machine architecture, such as the stack machine and the associative processor, are defined and compared. Parallel processors and distributed systems are also presented, along with an analysis of their performance relative to nonparallel machines. Recent correlated software packages should be used through labs. Brief historical perspective of the evolution of operating systems over the last fifty years, and then cover the major components of most

operating systems. This will include: Computer system structures, Operating system structures, Process and Process management: process synchronization and mutual exclusion; Interprocess communication, Process synchronization, Deadlocks, thread management, CPU scheduling: multiprogramming and time-sharing, scheduling approaches (SJF, FIFO, round robin, etc), Memory hierarchy and management: with and without swapping, virtual memory-paging and segmentation, page replacement algorithms, implementation., Virtual memory, Secondary storage management, I/O device management Protection and security, and Case studies: Linux and Windows. Recent correlated software packages should be used through labs.

PDIS 203 - System Analysis and Design.

<div dir="rtl">

تحليل وتصميم النظم

</div>

Fundamental concepts, system definition, information systems building blocks, information systems development, systems analysis, requirement discovery, data modeling and analysis, process modeling, object-oriented analysis and modeling, feasibility analysis and system proposal, System design, application architecture and modeling, database design, output design and prototyping, input design and prototyping, user interface design, object-oriented design and modeling, system construction and implementation, system operation and support. Lab works using CASE tool. Recent correlated software packages should be used through labs.

PDDS 204 - Operation Research.

<div dir="rtl">

بحوث العمليات

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This course is an introduction to the use of quantitative methods in business decision-making. Topics include linear programming, decision making under certainty, forecasting, queuing, and inventory systems. Recent correlated software packages should be used through labs.

PDBS 205 - Applied Probability and Statistics.

<div dir="rtl">

الإحصاء و الإحتمالات التطبيقية

</div>

Introduction to probability, properties of probability, methods of computing probability, probability distribution, sampling and sampling distribution. Review of sampling theory and distributions, point's estimates, confidence interval estimates. Tests of hypotheses and significance for large or small samples, operating characteristic curves, quality control chart, fitting theoretical distributions to sample frequency distributions, goodness of fit. Curve fitting, regression and correlation. Analysis of variance Students are instructed on the use of a statistics computer package at the beginning of them. Parametric classifiers, bays linear classify, linear classifier Design, clustering, parametric clustering, nonparametric clustering selection at representatives. Recent correlated software packages should be used through labs.

Third Semester

PDIT 301 - Computer Networks.

شبكات الحاسب

The principles and practice of computer networking, with emphasis on the Internet. The structure and components of computer networks, packet switching, layered architectures, OSI 7 layer model, TCP/IP, physical layer, error control, window flow control, local area networks (Ethernet, Token Ring; FDDI), network layer, congestion control, quality of service, multicast. Recent correlated software packages should be used through labs.

PDCS 302 - Artificial Intelligence.

الذكاء الإصطناعي

This is an introductory AI course. Topics will include Artificial and human intelligence, Overview of Artificial Intelligence, Basic Problem-Solving Strategies, Heuristic Search, Problem Reduction and AND/OR Graphs, domains of AI- symbolic processing: semantic nets, modeling model based reasoning, frames. Knowledge Representation, Representing Knowledge with If-Then Rules. Inference Engines, Inference techniques: implication, forward and backward chaining, inference nets, predicate logic, quantifiers, tautology, resolution, and unification. Rule based systems: inference engine, production systems, problem solving, planning, decomposition, and basic search techniques. AI languages: symbolic and coupled processing prolog: objects and relations, compound goals, backtracking, search mechanism, dynamic databases, lisp, program structure and operations, functions, unification, memory models. Fields of AI: heuristics and game plying, automated reasoning, problem solving, computational linguistics and natural language processing, computer vision, intelligent agents, robotics AI based computer systems: sequential and parallel inference machines, relation between AI and artificial neural nets, fuzzy systems. Recent correlated software packages should be used through labs.

PDIS 303 - Database Management Systems.

نظم إدارة قواعد البيانات

An introduction to the theory and design of database management systems. Topics covered include internals of database management systems, fundamental concepts in database theory, and database application design and development. In particular, logical design and conceptual modeling, physical database design strategies, relational data model and query languages, query optimization, transaction management and distributed databases. Lab works using ORACLE. Recent correlated software packages should be used through labs.

PDCS 304 - Object Oriented Programming.

البرمجة الشيئية

The course focuses on development of skills such as program design and testing as well as the implementation of programs using a graphical IDE. Topics include theory of object-oriented design, classes, interfaces, inheritance hierarchy, correctness; abstract data types,

encapsulation, formal specification with preconditions, post- conditions, and invariants, proofs of correctness; object-oriented software, classes and objects, classes as efficient programmer-defined data types, defining a class, data members, member functions, constructor functions, default constructor functions, destructor function, member function prototypes, member function default arguments, overloaded member functions,, inheritance, polymorphism, overloading; single and multiple inheritance, programming by contract, sub-classing as subcontract, specification and verification. Class scope, ``this" pointer, object instantiation, access specifiers private and public, encapsulation, information hiding, private data members, public member functions, private member functions, array of class objects, containership, virtual functions, friend function and class, function and class templates, stream and files. The above concepts are implemented in either visual C++, C# (Windows application)or Java. Recent correlated software packages should be used through labs.

PDIS 305 - Geographic Information Systems Fundamentals.

أساسيات نظم المعلومات الجغرافية

Discusses fundamental GIS concepts and terminology, the role of GIS in spatial data management and digital mapping, the multipurpose cadastre and resource GIS, methods of data collection and input, data modelling and representation, storage and retrieval of spatial data, concepts of database systems, manipulation and analysis features of GIS. Recent correlated software packages should be used through labs.

Fourth Semester

Elective Courses

PDIS 401 - Object Oriented System Analysis and Design.

<div dir="rtl">تصميم وتحليل النظم الموجه</div>

This course covers object-oriented analysis and design with special emphasis on what software developers, architects and analysts need to know to successfully execute object-oriented projects. The course teaches a proven method of building software systems by using activities of domain/business modeling, system analysis, and system architecture and design. The course teaches and practices a set of skills applicable for both small (lightweight) as well as large (and more rigorous) projects. Models in the course are presented in the UML notation. The emphasis in the course is on making participants able to deliver high quality models and designs leading to implementations The course teaches participants to build object models, to capture the structure and behaviors in the problem domain, capture requirements through use cases, and create and document architectures and designs. To produce the models, we will apply a step-by-step method that leads the participants through a set of development steps, and provides for high-integrity modeling by performing cross-checks between models, resulting in correct and consistent models. This method, which builds on the best processes for object-oriented development, will help establish a productive path from the problem domain to components and object-oriented code. The course provides numerous exercises and several case studies that enable participants to practice the learned material. Course can be followed up by mentoring, ensuring the fastest application of the analysis and design skills to the project at hand.

PDIS 402 - Object Oriented Database.

<div dir="rtl">قواعد البيانات الموجهة</div>

History of data models. Semantic data models. Problems in record-oriented models. Object data model. Classes and inheritance. Methods and messages. Multiple inheritance. Object queries. Object queries languages OQL. Indexing in object databases. Processing object queries. Object transaction. Concurrency control in object databases. Security in object databases. Using the object model in advanced applications. Recent correlated software packages should be used through labs.

PDIS 403 - Multimedia Information System.

<div dir="rtl">نظم معلومات الوسائط المتعددة</div>

Concepts and methods of design, management, creation, and evaluation of multimedia information systems. Theory and practice of digital media production, reception, organization, retrieval, and reuse. Review of applicable digital technology with special emphasis on digital video. Course will involve group projects in the design and development of digital media applications. Recent correlated software packages should be used through labs.

PDIS 404 - Spatial Data Acquisition Techniques.

<div dir="rtl">

تقنيات جمع البيانات الجغرافية ومراقبة الجوده

</div>

This course introduces methods of surveying field collection of data in a manner suitable for spatial analysis. Topics will include plane and topographic surveying, use of the levels, total stations, and the Global Positioning System (GPS), preparation of data for conversion to a digital format, map generation from surveying field data, accuracy, and quality of spatial data. The course has a main field and laboratory components. Recent correlated software packages should be used through labs.

PDIS 405 - Geodatabase Design.

<div dir="rtl">

تصميم قواعد البيانات الجغرافية

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The goal of this course is to introduce the main features of spatial databases, the kernel of Geographic Information Systems (GIS). Topics include: spatial concepts and data models, spatial query languages, spatial storage and indexing, query processing and optimization, spatial networks, introduction to spatial data mining. Exercises and practical work will be concentrated on building and designing geodatabases. Recent correlated software packages should be used through labs.

PDIS 406 - Spatial Analysis and Modeling.

<div dir="rtl">

التحليل والنمذجة باستخدام نظم المعلومات الجغرافية

</div>

This course explores methods of analyzing spatial data in the interactive and graphical environment of a GIS. The course draws on related theory in spatial statistics, geo-statistics, geographical analysis and cartographic modeling to provide a set of generic techniques for GIS users. Topics include the analysis of point patterns, networks, overlay analysis, spatial interaction models, and visualization of spatial data (virtual reality, simulation of landscape, animation, multi-media). The course concludes by considering how to extend the spatial analytical capabilities of GIS and points to the evolution of spatial decision support systems. Associated exercises and hands-on allow methods to be applied in a GIS context. Recent correlated software packages should be used through labs.

PDIS 407 - GIS Programming and Customization.

<div dir="rtl">

برمجة نظم المعلومات الجغرافية

</div>

Students learn to use the Visual Basic for Applications (VBA) programming environment to add functionality to ArcGIS. Students who successfully complete the course are able to automate repetitive tasks, customize the ArcGIS interface, and share their customizations with others. Recent correlated software packages should be used through labs.

PDIS 408 - E-Commerce.

<div dir="rtl">

التجارة الإلكترونية

</div>

This course provides the learner with an overview of the state of e-commerce today. It defines electronic commerce and discusses electronic commerce elements. An overview of business-

to-consumer and business-to-business electronic commerce is given. This course also addresses issues and technologies available for companies wishing to engage in e-commerce, this course introduces Introduction to E-commerce, E-Commerce Standards, E-commerce in Enterprise, E-commerce Technology Building Blocks. Recent correlated software packages should be used through labs.

PDIS 409 E-Business System Strategy

إستراتيجية نظم الأعمال الإلكترونية

This course focuses on business process redesign and change the management in the context of e-business. Topics include impact of e-business on business models, channel relationships and the value chain, integration of emerging technologies with legacy systems, functional and inter-organizational integration, and transaction cost issues. Applications include supply and selling chain management, customer relation management, enterprise resource planning, e-procurement, and knowledge tone applications. Recent correlated software packages should be used through labs.

PDIS 410 - Expert Systems

النظم الخبيرة

This course is a comprehensive treatment of Expert Systems (ES) as managerial support tools. This course will examine the design, development and implementation of expert systems (knowledge-based systems). It will also cover the following topics in ES: overview of AI and ES, knowledge engineering, knowledge acquisition techniques, knowledge representation techniques, reasoning techniques, and building expert systems. Also the students will learn how to use expert system shells such as EXSYS in building some ES applications. Recent correlated software packages should be used through labs.

PDIT 411 - Internet Technologies and Programming.

تكنولوجيا الإنترنت و برمجتها

 The aim of this course is to teach the students the fundamental technologies and techniques for creating applications on the World Wide Web (WWW). It will consider the architecture of the Web, static techniques for providing content such as HTML and CSS, and dynamic techniques such as client and server side scripting. At the end of the course the student should be able to discuss the architecture of the Web and write static web pages. Students will also be able to create dynamic web content, in particular, content obtained from a database. Students will be aware of the need for sessions for interactive web applications and how to establish sessions. Recent correlated software packages should be used through labs.

PDIT 412 - Wireless and Mobile Networks

الشبكات اللاسلكية و المحمولة

This course will cover :Mobility Management, Handoff Management: Detection and Assignment, Radio Link Transfer ,Network Signaling, Intersystem Handoff and Authentication in IS-41 ,Roaming ,Example networks: Cellular Digital Packet Data, GSM, General Packet Radio Service (GPRS), WLAN ,Mobile Number Portability, User Mobility, Device Mobility, Economic models, such as, Prepaid, Flat rate, Mobile Services

,Heterogeneous networks . Recent correlated software packages should be used through labs.

PDIT 413 - Network Security

أمان الشبكات

Discussion of the need for network security, describe various threats, attack types and hackers. Explain authentication, encryption & encryption standard. Secret-Key, public key algorithm authentication protocols, digital certificate. Virtual private network, (VPN), secure sockets layer (SSL). Firewalls, and firewalls topology, packet filters and proxy servers. Threats and couther measures in centralized and distributed systems; communication security techniques based on encryption; symmetric and asymmetric encryption; encryption modes, including stream and block encryption, and cipher-block chaining; message origin and mutual authentication; third-party and inter-realm authentication; authentication of mobile users; data confidentiality and integrity protocols; formal analysis of authentication protocols and message integrity; access control in distributed systems and networks; firewall design; case studies of security mechanisms and policies. Recent correlated software packages should be used through labs.

PDIT 414 - Computer Graphics and Animation

الرسم بالحاسب و الرسومات المتحركة

This course examines one or more selected current issues in the area of image synthesis. Specific topics covered are dependent on the instructor. Potential topics include: scientific visualization, computational geometry, photo-realistic image rendering and computer animation. Recent correlated software packages should be used through labs. Kinematics and techniques for character animation. Topics include physical modeling and simulation, motion planning, control and learning algorithms, locomotion, motion trajectory optimization, scripting languages, motion capture and motion editing. Students will implement algorithms and interactive animation tools. Recent correlated software packages should be used through labs. Recent correlated software packages should be used through labs.

PDIT 415 - Multimedia Systems

الوسائط المتعددة

Organization and structure of modem multimedia systems; audio and video encoding. Quality of service concepts; Screen resolution and screen technology, video accelerator design system, raster graphics (3D- transformation), analog-to- digital conversion, video compression, mixing and displaying at 30 FPS with full color capacity. Physics of sound, sound cards, sound cards limitations, mixing sound video and voice traffic control, animation. Scheduling algorithms for multimedia within OS and networks; multimedia protocols over high-speed networks; synchronization schemes; user-interface design; multimedia tele services. Recent correlated software packages should be used through labs.

PDIT 416 - Virtual Reality

الواقع الافتراضي

Design and implementation of software systems necessary to create virtual environments; techniques for achieving real time, dynamic display of photorealistic, synthetic images; hands-on experience with electromagnetically tracked, head mounted displays. Final project requires the design and construction of a virtual environment. Recent correlated software packages should be used through labs.

PDIT 417 - Digital Image Processing

معالجة الصور الرقمية

Scope and applications of image are processing. Perspective transformations (Modeling picture taking, perspective transformations in homogeneous coordinates and with two reference frames). The spatial frequency domain (The sampling theorem, template matching and the convolution theorem, spatial filtering). Enhancement and restoration, image segmentation. Image representation: (Spatial differentiation and smoothing, template matching, region analysis, contour following). Descriptive methods in scene analysis. Hardware and software considerations. Applications. Recent correlated software packages should be used through labs.

PDDS 418 - Computerized Project Management

إدارة المشروعات

Introduction to project management. Network construction rules for activity on arc and activity on node. Critical path method (CPM). Bar charts and resource distribution. Program evaluation and review technique (PERT). Scheduling techniques simple compression. Complex compression. Resource leveling. Heuristics in scheduling. Cost analysis. Recent correlated software packages should be used through labs.

PDDS 419 - Modeling and Simulation

النمذجه والمحاكاة

Basic simulation modeling, nature of simulation. system models & simulation, discrete event simulation, simulation of a single-server queuing system, simulation of an inventory system, list processing in simulation, simulation languages, simulation of time sharing systems, simulation output data and stochastic processes, building valid and credible simulation models, principles of valid simulation modeling, verification of simulation computer programs, an approach for developing valid &credible simulation models, statistical procedures for computing real-world observation & simulation output data, some practical considerations: selecting input probability distributions, random number generators, generating random variables, output data analysis for a single system. Recent correlated software packages should be used through labs.

PDDS 420 - Crisis Management

إدارة الأزمات

This course provides delegates with the capability to develop a crisis management plan and identify who should be represented on the crisis management team based on practice tools and techniques. Delegates learn how and when to invoke a crisis management plan and what immediate actions should be taken to ensure an effective recovery in the event of an incident or crisis. To identify issues relevant to the delegate's organization, a scenario exercise is developed and run as part. Recent correlated software packages should be used through labs.

PDDS 421 Decision Making Theory and Techniques

نظريات وأدوات إتخاذ القرار

The course provides the students with a broad and comprehensive perspective on different theoretical approaches to the study of individual, group, and organizational decision making. During the course we will discuss conceptual and methodological problems related to research in decision making, as well as to the development of theories in the area of decision making. The course will be organized from micro to macro, by way of treating decision making at the level of the individual, group and organization as well as in inter organizational settings. The course also covers individual and organizational learning. Issues related specifically to leadership and decision making will also be included. Recent correlated software packages should be used through labs.

PDDS 422 Optimization techniques

أدوات الأمثلة

The course covers the basic concepts, techniques, and tools related to optimization and optimal control for dynamical systems. Major topics include classical theory of maxima and minima, single variable search techniques, multivariable optimization procedures, calculus of variations, minimum principle, dynamic programming. Both continuous systems and discrete time systems are addressed. Fundamental optimization methods; linear programming, integer programming, network models, and dynamic programming methods of operations research. Modeling and applications of these methods in practical situations.

PDDS 423 Inventory Control and Production Management

إدارة الانتاج ورقابة المخزون

This course includes introduction to a variety of production planning and inventory control problems, The development of mathematical and simulation model required to solve these problems, job-shop scheduling, work methods, maintenance and quality management topics will be covered, supply chain management, facility layout, statistical quality control, inventory management (independent and dependent inventory models), solution approaches including the use of the available operation management software packages. Recent correlated software packages should be used through labs.

PDDS 424 Total Quality Management

This course is a broad introduction to total quality management and the field of operations management. Operations management entails all of the activities that create goods and services by transforming inputs into outputs. These activities include forecasting, process control, layout strategy, inventory management, aggregate planning, supply chain management, and work measurement. Total Quality Management is a guided tour along the road to total quality. It reviews the history of quality and examines the wide variety of philosophies, concepts, and techniques for managing, controlling and improving, quality. Finally, it takes you step-by-step through the implementation process. A survey of methods used to apply principles of total quality management (TQM) in various organizational settings to improve quality and productivity. Topics include evolution of TQM theory; TQM models, tools, and techniques; development of TQM teams; production of graphs and charts; strategies for meeting customer expectations; benchmarking; and comparison of TQM applications.