كلية الحاسبات والمعلومات

Faculty of Computers and Information

اللائحة الداخلية لمرحلة البكالوريوس بنظام

الساعات المعتمدة

REGULATIONS AND CURRICULA

- تعريفات وأهداف
- الأقسام والدرجات العلمية
- لائحة مرحلة البكالوريوس

✦ الملاحق وجداول المقررات الدراسيةوتوصيفها

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صدرت بالقرار الوزارى رقم[ ]بتاريخ / / ٢٠م

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كان للتحول من المجتمع الصناعى إلى مجتمع المعلومات وما صاحب ذلك من تغيير فى السلوك والأفكار أثره الكبير فى حياتنا اليومية، فلقد بات فى وسعنا اليوم – إلى حد كبير- أن نكتب للمستقبل تاريخا، كما نكتب تاريخ الماضى، فكلما ازدادت قدرتنا على حساب المستقبل ورؤيته قبل وقوعه، على أسس علمية صحيحة فى رصد الواقع واستدلال النتائج، كلما نقصت مشكلاتنا وعشنا عصرنا ومستقبلنا مشاركين فيه، غير مكتفين باستهلاك منتجاته.

ولا شك أن القوة الكبرى وراء هذا التحول المعلوماتى تكمن فى أدواته، وعلى رأسها الحاسبات والمعلومات ، والبشر الذين يناضلون لاستغلال إمكانيات الحاسبات الهائلة، وبديهى أن يكون للجامعات نصيبها الوافر فى هذا النضال؛ ولذا فقد دعت الضرورة إلى تصميم لوائح لمرحلة البكالوريوس بكلية الحاسبات والمعلومات تواكب العصر وتقبل متغيراته وتحدياتهمن خلال تطوير وتحديث برامجها التعليمية سعياً للوصول إلى معايير الاعتماد الأكاديمية المحلية والدوليةلتطوير نظام الدراسة فيها، وإعادة تقييم المناهج والمقررات التى يتم دراستها، والأخذ بأحدث النظم التعليمية التى تسمح بقدر أكبر من المشاركة الطلابية ، وتفتح مجالات الاختيار أمام الطلاب فى دراسة المقررات وفقاً لقدراتهم وإمكانياتهم ورغباتهم . وفى هذا الإطار تسعي الكلية إلى تطبيق نظام الساعات المعتمدة المعمول به فى عديد من الجامعات العالمية الكبيرة .

وبين يديك الآن اللوائح الداخلية التى تنظم العمل فى مرحلة البكالوريوس بكلية الحاسبات والمعلومات بجامعة المنوفية، وكذلك الخطط الدراسية لدرجة البكالوريوس. وقد روعى أن ترتبط مقررات البكالوريوس بالتطور الحالى في التخصص. لذا تتسم طبيعة هذه المقررات بعلاقتها المباشرة بالتطبيقات المطلوبة لهذا السوق.

ولا شك أن هذه اللوائح والخطط تحتاج مع مرور الوقت إلى إعادة النظر والتطوير الدائم ، حتى لا يفلت منا عصرنا أو نفلت منه.

وتخضع هذه اللائحة لأحكام قانون تنظيم الجامعات ولائحته التنفيذية والقوانين الجمهورية المعدلة لهما، كما تخضع للقرارات المنظمة للعمل بقطاع شئون التعليم بجامعة المنوفية.

والله الموفق إلى سواء السبيل،

أ. د. عربي السيد كشك **عميد الكلية**

أ.د/ عادل السيد مبارك **رئيس الجامعة**

فهرس المحتويات

مادة (١) رسالة الكلية وأهدافها

تتلخص رسالة الكلية في إعداد خريج متميز في مجالات علوم الحاسب ونظم وتكنولوجيا المعلومات ودعم القرار قادر على توظيف مكتسباته العلمية ومهاراته العملية لتلبية متطلبات سوق العمل، كما تهدف الى إنتاج بحث علمي راقي والقيام بدورها المجتمعي من خلال تقديم استشارات فنية ودعم تقنى.

كما تتلخص رؤية الكلية فى تحقيق الريادة محلياً واقليمياً في مجالات علوم الحاسب ونظم وتكنولوجيا المعلومات ودعم القرار من خلال تقديم تعليم اكاديمي وبحث علمي متميز لخدمة وتنمية المجتمع معرفياً و مهارياً وأخلاقياً.

تهدف الكلية إلى تحقيق الأغراض التالية:

١. إعداد كوادر متميزة معرفياً ومهارياً ومهنياً من خلال برامج متطورة بما يؤهلهم للمنافسة العالمية فى تطوير تكنولوجيا الحاسبات والمعلومات وتطبيقاتها.
٢. تهيئة البيئة المناسبة للبحث فى مجالات الفروع المختلفة للحاسبات والمعلومات.
٣. تقديم الاستشارات والمساعدات العلمية والفنية للهيئات والجهات التى تستخدم تكنولوجيا الحاسبات والمعلومات.
٤. تدريب الكوادر الفنية فى قطاعات الدولة المختلفة على تكنولوجيا الحاسبات والمعلومات.
٥. نشر الوعي وتعميقه فى المجتمع بهدف استخدام تكنولوجيا الحاسبات والمعلومات.
٦. تنظيم المؤتمرات وعقد الاجتماعات العلمية بهدف الارتقاء بالمستوي التعليمي والبحثى.

٧. بناء وتفعيل علاقات شراكة استراتيجية مع مؤسسات وشركات تكنولوجيا المعلومات والمؤسسات المناظرة على المستوي المحلي والإقليمي والعالمي بهدف تبادل الخبرات وإجراء البحوث المتعلقة بتخصصات الحاسبات والمعلومات.

٨. الارتقاء بنوعية ومستوى البحوث من خلال التفاعل المستمر مع قضايا المجتمع وتدعيم وسائل النشر والبحث العلمي فى شتي مجالات التخصص.

٩. ميكنة العمل الإدارى وتأهيل الاداريين لاستخدام تكنولوجيا المعلومات فى أداء الخدمات الطلابية بجودة فائقة.

مادة (٢) قواعد القبول بالكلية

تقبل كلية الحاسبات والمعلومات الطلاب الحاصلين على الثانوية العامة شعبة الرياضيات من خلال مكتب تنسيق القبول بالجامعات ويتم قبول طلاب الشهادات المعادلة والطلاب الوافدين حسب القواعد المنظمة لذلك والتي تضعهاالمجلس الاعلى للجامعات، ويجوز قبول طلاب الثانوية العامة الشعبة العلمية بالبرامج المميزة وفقا للأئحة البرامج الخاصة بالكلية.

مادة (٣) أقسام الكلية

تضم كلية الحاسبات والمعلومات – جامعة المنوفية الأقسام التالية:

١- قسم علوم الحاسب

٢- قسم تكنولوجيا المعلومات

٣- قسم نظم المعلومات

٤- قسم بحوث العمليات ونظم دعم القرار

كل من هذه الاقسام الاربعة يطرح برنامج بكالوريوس.

كما تضم الكلية برامج مميزة لها لائحتها الخاصة المعتمده وهى كالتالى:

١- برنامج هندسة البرمجيات ويقوم بالإشراف العلمى عليه قسم علوم الحاسب

٢- برنامج الحوسبة والمعلوماتيه الحيوية ويقوم بالإشراف العلمى عليه قسم نظم المعلومات

ويجوز أن تنشأ بالكلية أقسام وبرامج أخري مستقبلاً وفقاً لأحكام قانون تنظيم الجامعات.

١- قسم علوم الحاسب

ويتضمن المجالات العلمية التالية:

برمجة الحاسبات ومفاهيم لغات الحاسب ومترجماتها – هياكل البيانات وتنظيم ومعالجة الملفات – تحليل وتصميم الخوارزميات – نظم تشغيل الحاسبات – بنية وتنظيم الحاسبات – هندسة البرمجيات – أسس وتطبيقات الذكاء الإصطناعى – النظم الذكية – النظم الخبيرة – معالجة

اللغات الطبيعية – نظم الوكلاء المتعددة – الشبكات العصبية – الخوارزميات الجينية – نظم قواعد المعرفة – المعالجة على التوازى والنظم الموزعة – نظم التعليم الذكية – تعليم الحاسبات – طرق اتصال الإنسان بالحاسب – تعريب الحاسبات – الحوسبة السحابية.

٢- <u>قسم تكنولوجيا المعلومات</u>

ويتضمن المجالات العلمية التالية:

شبكات الحاسبات بأنواعها المختلفة - شبكات المعلومات وتطبيقاتها - تكنولوجيا الاتصالات - تكنولوجيا الإنترنت - تأمين وسرية المعلومات والشبكات - التعرف على الأنماط - معالجة الإشارات الرقمية - التعرف على الكلام وتوليده - التعرف على الصور ومعالجتها - الرؤية بالحاسب - نظم الرسم بالحاسب والرسوم الحاسوبية المتحركة - الواقع الافتراضي - الوسائط المتعددة - ضغط البيانات وتأمينها- نظم الزمن الحقيقي - النظم الرقمية – عمارة الحاسبات– المعالجات الدقيقة وتطبيقاتها - مواجهات الحاسبات - النظم المدمجة – الحاسبات الذكية والكمية – نظم الحاسبات ذات الأعطال المحتملة - نظم الحاسبات الموزعة والمتوازية - النظم الديناميكية والإنسان الآلي - التعلم الإلكتروني والمكتبات الرقمية - هندسة المعلومات - الأعمال الإلكترونية.

٣- <u>قسم نظم المعلومات</u>

ويتضمن المجالات العلمية التالية:

تحليل وتصميم نظم المعلومات -منهجيات تطوير نظم المعلومات – معماريات نظم المعلومات – نظم تخزين واسترجاع المعلومات - نظم قواعد البيانات – نظم المعلومات - نظم المعلومات الإدارية - نظم المعلومات الجغرافية - نظم معلومات الوسائط المتعددة - نظم المعلومات الموزعة - نظم المعلومات الذكية - اكتشاف المعرفة فى نظم قواعد البيانات - قواعد البيانات الشيئية – اقتصاديات نظم المعلومات - التنقيب في البيانات - مستودعات البيانات - إدارة مراكز المعلومات - نظم المعلومات المتكاملة - منهجيات تطوير نظم المعلومات - تأكيد جودة البرمجيات ونظم المعلومات - تطبيقات نظم المعلومات فى المجالات المختلفة – التجارة الإلكترونية – نظم معلومات الشبكة الدولية (الإنترنت).

٤- <u>قسم بحوث العمليات ونظم دعم القرار</u>

ويتضمن المجالات العلمية التالية:

أساسيات ومفاهيم علم النظم - بحوث العمليات ومنهجية دعم القرار– النمذجة والمحاكاة – لغات الحاسب للمحاكاة – تطبيقات الحاسبات والمحاكاة فى الإدارة والاقتصاد – البرمجة الخطية وغير

الخطية – البرمجة متعددة الأهداف – البرمجة العشوائية والديناميكية – الحسابات الذكية – نظرية الشبكات وتخطيط المشروعات – نظم صفوف الانتظار – نظم مراقبة المخزون والإنتاج – أدوات وأساليب دعم القرار – نظم دعم القرار – إدارة البيانات فى دعم القرار – نظم دعم القرار المعرفية –تكنولوجيا دعم القرار- التحليل الإحصائي فى دعم القرار – نظم المعلومات الجغرافية لدعم القرار – الإدارة الاستراتيجية – إدارة الجودة الكلية – المباريات وإدارة الأزمات – النماذج التطبيقية المختلفة للإنتاج والخدمات والاقتصاد والإدارة.

مادة (٤) الدرجات العلمية

تمنح جامعة المنوفية بناء على طلب مجلس كلية الحاسبات والمعلومات درجة البكالوريوس فى الحاسبات والمعلومات فى أحد التخصصات التالية:

(أ) علوم الحاسب .

(ب) تكنولوجيا المعلومات.

(ج) نظم المعلومات.

(د) بحوث العمليات ونظم دعم القرار.

(هـ) برنامج الحوسبة والمعلوماتية الحيوية.

(و) برنامج هندسة البرمجيات.

ويتعين على الطالب أن يختار تخصصاً من بين تخصصات الكلية العامة او تخصص من البرامج المميزة بالكلية. وتختص هذه اللائحة بالاربعة برامج الحكومية الاولي

مادة (٥) نظام الساعات المعتمدة

يتطلب الحصول على درجة البكالوريوس ان يجتاز الطالب بنجاح دراسة (١٤٤) ساعة معتمدة تتضمن متطلبات عامة، ومتطلبات للكلية إلى جانب متطلبات التخصص. وذلك على مدي ثمانية فصول دراسية أساسية، مقسمة إلي أربعة مستويات دراسية ويجوز لمجلس الكلية أن يقر فصل دراسي صيفى إختيارى عبارة عن ثمانية أسابيع مكثفة (نظرى وعملى وامتحانات).

مادة (٦) نظام الدراسة

أ- تعتمد الدراسة بالكلية على نظام الساعات المعتمدة، ويقسم العام الدراسي إلي فصلين دراسيين أساسيين، وتكون الساعة المعتمدة هي وحدة قياس دراسية لتحديد وزن المقرر الدراسي.

ب- الدراسة فى المستوى الأول والثاني عامة لجميع التخصصات العامة بالكلية ويبدأ التخصص فى المستوى الثالث عند اجتياز أكثر من ٦٠ ساعة. ولكل قسم أن يضع الشروط المؤهلة للالتحاق به بعد إقرارها من مجلس الكلية.

ج- معيار الساعة المعتمدة: تكون الساعة المعتمدة هى وحدة القياس الدراسية لتحديد وزن المقرر النسبى، بإعتبار أن وزن الساعة النظرية يكافئ ساعة معتمدة ووزن الساعة العملية أو التمارين يكافئ نصف ساعة معتمدة (٢ ساعة عملية معتمدة = ساعة واحدة).

د- يؤدى الطالب تدريب صيفى لمدة ٤ أسابيع بعد إجتياز ٥٠% على الأقل من عدد الساعات المعتمده كشرط أساسى للتخرج ويقوم مجلس الكلية بوضع القواعد الخاصة للتدريب الصيفى من حيث المجالات وأماكن التدريب ونظام توزيع الطلاب ونظام المتابعة والتقييم.

هـ- البرامج المميزة لها نظامها الخاص الذى يحدد وفقا للوائح الداخليه بالكلية.

مادة (٧) مشروع التخرج

يسجل الطالب لمقرر المشروع ٦ ساعات معتمدة فى المستوى الرابع (بعد اجتياز ١٠٢ ساعة معتمده على الاقل) على مدى فصليين دراسين متتاليين ولا يتخرج الطالب إلا بعد أن يستوفي شروط النجاح في المشروع.

مادة (٨) لغة التدريس

الدراسة فى كلية الحاسبات والمعلومات باللغة الإنجليزية ويجوز دارسة بعض المقررات الدراسية باللغة العربية بعد موافقة مجلس الكلية وذلك وفقا لمتطلبات كل مقرر دراسي.

مادة (٩) الإرشاد الأكاديمي

تحدد الكلية لكل مجموعة من الطلاب مرشداً أكاديمياً من بين أعضاء هيئة التدريس يقوم بمهام الإرشاد الأكاديمي للطالب ومساعدته على اختيار المقررات التى يدرسها والتسجيل فيها وتوجيهه طوال فترة دراسته بالكلية. ويقوم مجلس الكلية بتوزيع الطلاب المقيدين بالكلية على هيئة التدريس بناء على توصية لجنة شئون التعليم والطلاب ويعتبر رأي المرشد الأكاديمي استشارياً والطالب هو المسئول عن المقررات التى يقوم بالتسجيل فيها بناء على رغبته.

مادة (١٠) التعليم عن بعد أوالتعليم الالكترونى

يسمح النظام الدراسى بالكليه بتدريس بعض المقررات الالكترونية، عن طريق الإنترنت أو الفيديو كونفرانس، أو أي وسيلة من وسائل التعليم عن بعد على ألا تزيد نسبتها عن ٢٠% من إجمالى الساعات المعتمدة بعد موافقة مجلس الكلية، وفي جميع الأحوال يجرى الامتحان

النهائى يداخل الحرم الجامعي.وتبعا للتعليمات المنظمة لذلك من حيث التفاعل مع المحاضر وتقديم التقارير والدراسات وخلافه.

مادة (١١) التسجيل والحذف والإضافة

أ- مع بداية كل فصل دراسي يقوم الطالب بتسجيل المقررات الدراسية التى يختارها، وذلك من خلال نماذج طلب التسجيل التى توفرها الكلية وفى الأوقات التى يحددها مجلس الكلية قبل بدء انتظام الدراسة.

ب- يحدد مجلس الكلية الحد الأدني لعدد الطلاب للتسجيل فى كل مقرر في بداية كل فصل دراسي.

ج- يكون الحد الأدني للساعات المعتمدة للتسجيل فى كل فصل دراسي اساسي(٩) ساعات، والحد الأقصي (١٨) ساعة. ويجوز لمجلس الكلية الترخيص بتجاوز الحد الأدنى والحد الأقصي للساعات المعتمدة للتسجيل لدواعي تخرج الطالب بحيث لا يزيد التجاوز عن ٣ ساعات بالنقص او الزيادة. بينما الحد الأقصى للتسجيل بالفصل الصيفى (٦) ساعات يمكن ان تزيد الي ٩ ساعات اذا كان هناك دواعي لتخرج الطالب.

د- يجوز للطالب بعد إكمال إجراءات التسجيل أن يحذف أو يضيف مقرراً أو أكثر وذلك خلال فترة تحددها الكلية للحذف والإضافة، ويتم ذلك بالتنسيق مع المرشد الأكاديمي للطالب ومن خلال نماذج محددة توفرها الكلية.

هـ-لا يجوز للطالب القيد فى أي مقرر له متطلبات سابقة إلا بعد دراسة هذه المقررات واجتيازها بنجاح.

مادة (١٢) الانسحاب من المقرر

أ- يجوز للطالب بعد تسجيل المقررات التى اختارها أن ينسحب من مقرر أو أكثر خلال فترة محددة تعلنها إدارة الكلية بحيث لا يقل عدد الساعات المسجلة للطالب عن الحد الأدني للتسجيل فى الفصل الدراسي الواحد (٩ ساعات معتمدة) وفى هذه الحالة لا يعد الطالب راسباً فى المقررات التى انسحب منها ويحتسب له تقدير "منسحب" فقط.

ب-إذا انسحب الطالب من مقرر أو أكثر بعد الفترة المحددة لذلك دون عذر قهري يقبله مجلس الكلية يحتسب له تقدير "راسب" فى المقررات التى انسحب منها. أما إذا تقدم قبل الامتحان بشهر على الأقل بعذر قهري يقبله مجلس الكلية فيحتسب له تقدير "منسحب".

ج – للطالب أن ينسحب بحد أقصى ثمانية مقررات خلال فترة الدراسه بالكلية بحيث لا يزيد عدد المقررات التي ينسحب منها الطالب عن ثلاث مقررات في الفصل الدراسي وما يزيد عن ذلك سواء في الفصل او في الاجمالي يعتبر "راسب".

مادة (١٣) المواظبة والغياب

أ- الدراسة فى كلية الحاسبات والمعلومات نظامية ولا يجوز فيها الانتساب وعلى الطالب حضور الدروس النظرية والتمارين العملية والتطبيقية وفقا للنظام الذى يقره مجلس الكلية وتخضع عملية متابعة حضور الطالب لقواعد تحددها إدارة الكلية.

ب- يتطلب دخول الطالب الامتحان النهائي تحقيق نسبة حضور لا تقل عن ٧٥% من المحاضرات والمعامل فى كل مقرر على حده، وإذا تجاوزت نسبة غياب الطالب – دون عذر مقبول – فى أحد المقررات ٢٥% لمجلس الكلية حرمانه من دخول الامتحان النهائي بعد إنذاره، وفى هذه الحالة يعتبر الطالب راسب فى المقررات التى حرم من التقدم للإمتحان فيها. أما إذا تقدم الطالب بعذر يقبله مجلس الكلية يعتبر غائبا بعذر مقبول يحتسب تقدير منسحب فى المقرر الذي قدم عنه العذر.

ج- الطالب الذي يتغيب عن الامتحان النهائي لأى مقرر – دون عذر مقبول – يعطي درجة "صفر" فى ذلك الامتحان ولا تحتسب له درجات الأعمال الفصلية التى حصل عليها.

د- إذا تقدم الطالب بعذر قهري يقبله مجلس الكلية عن عدم حضور الإمتحان النهائى في فترة أقصاها نهاية الامتحانات. يحتسب له عذر مقبول ويحصل الطالب على تقدير غير مكتمل ويحتفظ الطالب بدرجة أعمال السنة ويعاد له الامتحان النهائى في المادة مرة أخرى بشقيها العملي والتحريرى.

مادة (١٤) الانقطاع عن الدراسة

أ- يعتبر الطالب منقطعاً عن الدراسة إذا لم يسجل فى فصل دراسي أو انسحب من جميع مقررات الفصل الدراسي بدون عذر مقبول ويدون في النتيجة (غير مسجل).

ب- يجوز للطالب أن يتقدم بطلب لإيقاف القيد بالكلية حسب الشروط والضوابط التى تضعها الجامعة.

مادة (١٥) نظام الامتحانات

أ- يتم تصحيح امتحان كل مقرر من (١٠٠) درجة.

ب- الحد الأدني للنجاح فى المقرر الدراسي هو ٥٠% من الدرجة النهائية.

ج- توزع درجات الامتحان فى كل مقرر على النحو التالي:

- **الأعمال الفصلية على النحو التالى:**

- ٢٠% للامتحانات التى يجريها الأستاذ بصفة دورية والتمارين العملية أو الأعمال التى يكلف بها الطلاب أثناء الفصل الدراسي.
- ٢٠% لامتحان منتصف الفصل الدراسي.
- **الأختبار النهائى:** ٦٠% لامتحان نهاية الفصل الدراسي.

ويكون لمجلس الكلية تحديد مواعيد امتحانات منتصف الفصل الدراسي،والامتحانات النهائية وإعلانها للطلاب فى وقت مناسب.

هـ- إذا تضمن الامتحان النهائي فى أحد المقررات بناء على إقتراح مجالس الاقسام وموافقة مجلس الكلية اختباراً تحريرياً وآخر عملياً فإن درجات الطالب فى هذا المقرر تتكونمن مجموع درجات الاختبار التحريري والعملي بالإضافة إلى الأعمال الفصلية. ويشترط حصول الطالب على نسبة ٣٠% من درجات الإختبار التحريرى وإلا إعتبر الطالب "راسب لائحيا" وفى تلك الحالة لا تضاف درجات العملى والأعمال الفصلية الى درجات الإختبار التحريرى ويرصد للطالب في النتيجة راسب لائحه (رل) فى حالة عدم تحقيقه ٣٠% من درجة التحريري.

و- ينذر الطالب - أكاديمياً - إذا وصل معدله التراكمي الحالي إلى أقل من٢ فإذا لم يستطع رفع معدله التراكمي فى الفصل التالي يوجه له إنذار ثان. ويجوز لمجلس الكلية منح الطالب فرصة استثنائية وأخيرة لرفع معدله التراكمي بعذر مقبول ويفصل الطالب في حالة عدم استطاعته من رفع معدله التراكمى في تلك الفرصة الإستثنائية. ويحتسب المعدل التراكمي طبقا للمادة رقم (١٦) مع عدم الإخلال بقانون تنظيم الجامعات.

مادة (١٦) نظام التقويم

النسبة المئوية للدرجة	التقدير	النقاط
٩٠% فأكثر	A+	٤
٨٥% - أقل من ٩٠%	A	٣,٧
٨٠% - أقل من ٨٥%	B +	٣,٣
٧٥% - أقل من ٨٠%	B	٣
٧٠% - أقل من ٧٥%	C +	٢,٧

٦٥% – أقل من ٧٠%	C	٢,٤
٦٠% – أقل من ٦٥%	D+	٢,٢
٥٠% – أقل من ٦٠%	D	٢
أقل من ٥٠%	F	صفر

أ- تتبع الكلية نظام الساعات المعتمدة والذي يعتمد على أن الوحدة الأساسية هي المقرر الدراسي وليس السنة ويكون نظام التقييم على أساس التقدير فى كل مقرر دراسي بنظام النقاط والذي يحدد طبقاً للجدول التالي:

ب) حساب المعدل التراكمي

يتم حساب المعدل التراكمي للطالب (GPA) على النحو التالي:

١- يتم ضرب قيمة تقدير كل مقرر دراسي (النقاط الموضحة فى الجدول) فى عدد الساعات المعتمدة لهذا المقرر لنحصل على عدد النقاط الخاصة بكل مقرر دراسي.

٢- يتم جمع نقاط كل المقررات الدراسية التى سجل فيها الطالب للمقررات التى سجل فيها الطالب ونجح فيها.

٣- يتم قسمة مجموع النقاطللمقررات التى سجل فيها الطالب ونجح فيها على إجمالي الساعات المسجلة للطالب لنحصل على المعدل التراكمي كما يلي:

$$\text{المعدل التراكمي GPA} = \frac{\text{مجموع النقاط}}{\text{إجمالي الساعات المسجلة}}$$

٤- يتم حساب التقدير العام للطالب بناء على المعدل التراكمي طبقاً للجدول التالي:

المعدل التراكمي	التقدير العام
أقل من ١,٥	ضعيف جدا
١,٥ – أقل من ٢	ضعيف
٢ – أقل من ٢,٥	مقبول
٢,٥ – أقل من ٣	جيد
٣– أقل من ٣,٥	جيد جداً
٣,٥ فأكثر	ممتاز

حساب التقدير العام

٥- يمنح الطالب مرتبة الشرف في حالة اجتيازه المستويات الدراسية التي درسها بكل مستوى دراسي بتقدير لا يقل عن جيد جدا وبشرط ألا يرسب في أي مقرر قد درسه.

مادة (١٧) الرسوب والإعادة

إذا رسب الطالب فى مقرر فعليه إعادة دراسته والامتحان فيه مرة أخري. فإذا نجح فى المقرر بعد إعادة دراسته تحتسب له الدرجات الفعلية التى حصل عليها بتقدير بما لا يزيد عن ٦٤% ويحسب معدله التراكمي على هذا الأساس.

مادة (١٨) أحكام تنظيمية

أ- يقوم كل قسم بإعداد توصيف كامل لمحتويات المقررات التى يقوم بتدريسها، وتعرض هذه المحتويات على لجنة شئون التعليم والطلاب. وبعد اعتمادها من مجلس الكلية تصبح هذه المحتويات ملزمة لأعضاء هيئة التدريس القائمين بتدريس تلك المقررات.

ب- يجوز لمجلس الكلية بناءً على اقتراح مجالس الأقسام المختصة، تعديل المحتوي العلمي لأي مقرر من المقررات الدراسية بما لا يخل باللائحة الداخلية للكلية.

ج- تقوم لجنة شئون التعليم والطلاب بالكلية بمتابعة الطلاب دورياً من خلال التنسيق مع المرشد الأكاديمي، ويعطي كل طالب بياناً بحالته الدراسية إذا ظهر تدني مستواه. ويعتمد مجلس الكلية مستويات المتابعة تلك. ويضع الضوابط التى يمكن من خلالها متابعة وتحسين حالة الطالب.

مادة (١٩) تحديد المستوى الدراسى وقواعد التخصص

أ- ينتقل الطالب من المستوى الأول للمستوى الثانى عند إجتياز ٣٠ساعة معتمده على الأقل وينتقل من المستوى الثانى إلى الثالث عند إجتياز ٦٦ ساعة على الأقل ومن المستوى الثالث إلى المستوى الرابع عند إجتياز ١٠٢ ساعة على الأقل.

ب- يحق لأى طالب التقدم للتخصص في قسم من الأربعة أقسام بعد إكتمال عدد ساعاته ٦٠ساعة معتمده.

مادة (٢٠)

تطبق أحكام لائحة قانون تنظيم الجامعات ولائحته التنفيذية فيما لم يرد فيه نص فى هذه اللائحة.

مادة (٢١)

أ- تطبق أحكام هذه اللائحة على الطلاب المستجدين فى بداية العام الجامعي التالي لاعتمادها.

ب- تطبق أحكام هذه اللائحة اعتباراً من العام الدراسي التالي لاعتمادها على الطلاب الباقين للإعادة بالفرقة الأولي. على أن تجري لهم المقاصة العلمية اللازمة باحتساب وحدات المقررات التى نجحوا فيها ضمن وحدات المقررات الإجبارية، أما المقررات الاخرى التى نجحوا فيها فتحتسب ضمن وحدات المقررات الاختيارية المطلوبة منهم من خارج التخصص.

ج- طلاب الفرق الأخرى تطبق عليهم قواعد اللائحة التى تم قبولهم عليها لحين تخرجهم.

مادة (٢٢) المقررات الدراسية

يشترط للحصول على درجة البكالوريوس فى الحاسبات والمعلومات فى أحد تخصصات الكلية دراسة ١٤٤ ساعة معتمدة موزعة على النحو التالي:

١- المتطلبات العامة (٩) ساعة معتمدة:

* (٦) ساعة إجبارية
* (٣) ساعة يختارها الطالب من بين المقررات الاختيارية.

٢- متطلبات الكلية (٧٢) ساعة معتمدة:

* (٦٦) ساعة إجبارية
* (٦) ساعة يختارها الطالب من بين المقررات الاختيارية.

٣- متطلبات التخصص (٦٣) ساعة معتمدة:

* (٣٩) ساعة إجبارية
* (٢٤) ساعة يختارها الطالب من بين المقررات الاختيارية ويجوز الاختيار من بين مقررات الأقسام الأخرى بحد أقصى (٩) ساعة معتمدة.

Subject Area	NARS	اللائحة
Humanities, Ethical, and Social Sciences	12-18%	15%
Mathematics and Basic sciences	16-18%	18%
Basic Computing Sciences	26-28%	28%
Applied Computing Sciences	20-28%	25%
Projects & Practice	6-10%	6 %
Discretionary Subjects	8-12%	8 %

مادة (٢٣) قواعد النظام الكودى لارقام المقررات

١- يتكون كود أى مقرر من الرمز الكودى للقسم، يلى ذلك عدد مكون من ثلاثة أرقام تفصيلها كالآتي :

(أ) الرقم أقصى اليسار يمثل المستوى الدراسى

(ب) الرقم فى خانة العشرات يمثل التخصص الدقيق للمقرر داخل التخصص العام للقسم

(ج) رقم الأحاد يستخدم لتمييز مقررات التخصص الدقيق والتى تدرس لنفس التخصص العام

٢- النظام الرمزى للأقسام العلمية

مسلسل	القسم	باللغة الإنجليزية
١	علوم الحاسب	CS
٢	تكنولوجيا المعلومات	IT
٣	نظم المعلومات	IS
٤	بحوث العمليات و دعم القرار	OD

٣- النظام الرمزى لمقررات الرياضيات والإحصاء والعلوم الانسانية

رياضيات	MA
إحصاء	ST
علوم إنسانية	HM
مقررات عامة	GN

٤- اكواد المستويات الدراسية

المستوى الدراسي	الكود
الاول	١
الثانى	٢
الثالث	٣
الرابع	٤

وتشمل مواد اللائحة التالية علي قوائم المقررات الدراسية المختلفة موضحا عدد الساعات المعتمدة لكل مقرر وما يناظرها من الساعات الفعلية من المحاضرات و المعامل والتمارين.

مادة (٢٤) المتطلبات العامة:

٩ ساعة معتمدة (٦ إجباري+ ٣ اختياري) بالإضافة لمقرري حقوق الانسان والجودة كمتطلب جامعة ولا تحسب متطلبات الجامعة فى أجمالي ساعات التخرج المطلوبة.

رقم المقرر	اسم المقرر	عدد الساعات المعتمدة	محاضرة	تمارين / عملي	المتطلب السابق
مواد اجبارية (٦ ساعات ٢مقرر)					
GN170	صياغة التقارير العلمية والفنية Scientific & Technical Report Writing	٣	٣	–	–
GN 112	مباديء ادارة Fundamentals of Management	٣	٣	٠	–
HM110	حقوق إنسان Human Rights	٠	١	٠	–
GN160	الجودة Quality		١	٠	–
مواد إختيارية (٣ ساعات)					
GN150	مبادئ الاقتصاد Fundamentals of Economics	٣	٣	–	–
GN140	أخلاقيات المهنة Professional Ethics	٣	٣	–	–
GN130	مهارات التفاوض والاتصال Communication & Negotiation Skills	٣	٣	–	–
GN120	الابداع وريادة الاعمال Innovation and entrepreneurship	٣	٣	–	–
GN180	التفكير الإبداعى وحل المشكلات Creative Thinking and Problem Solving	٣	٣	–	–

مادة (٢٥) متطلبات الكلية:٧٢ ساعة معتمدة (٦٦ ساعة إجباري +٦ ساعة اختياري)

(أ) المتطلبات الإجبارية ٦٦ ساعة معتمدة

رقم المقرر	اسم المقرر	الساعات المعتمدة	محاضرة	تمارين/ عملي	المتطلب السابق
MA111	رياضيات–١ Mathematics-1	٣	٢	٢	–
OD111	تراكيب محددة Discrete Mathematics	٣	٢	٢	–

رقم المقرر	اسم المقرر	الساعات المعتمدة	محاضرة	تمارين/ عملي	المتطلب السابق
CS131	مباديء برمجة Fundamentals of Programming	٣	٢	٢	Computer Introduction CS111
CS111	مقدمة فى الحاسبات Computer Introduction	٣	٢	٢	–
CS110	أشباه الموصلات Semiconductors	٣	٢	٢	–
IT181	تصميم منطقي Logic Design -1	٣	٢	٢	Semiconductors CS110
MA112	رياضيات–٢ Mathematics-2	٣	٢	٢	Mathematics-1 MA111
IS111	مقدمة نظم معلومات Introduction to IS	٣	٢	٢	–
ST190	إحصاء واحتمالات Statistics & Probabilities	٣	٢	٢	Mathematics-1 MA111
CS132	برمجة حاسبات – ١ Computer Programming – 1	٣	٢	٢	Fundamentals of Programming CS131
IT282	معمارية الحاسب Computer Architecture	٣	٢	٢	Logic Design -1 IT181
IT261	وسائط متعددة – ١ Multimedia-1	٣	٢	٢	Computer Programming-1 CS132
CS233	برمجه حاسبات – ٢ Computer Programming-2	٣	٢	٢	Computer Programming-1 CS132
CS212	هياكل البيانات Data Structure	٣	٢	٢	Computer Programming-2 CS132
OD213	مقدمة فى بحوث العمليات ودعم القرار Introduction to Operation Research & Decision Support	٣	٢	٢	Mathematics-2 MA112
IS212	تحليل وتصميم نظم–١ Systems Analysis & Design -1	٣	٢	٢	Introduction to IS IS111
CS261	نظم تشغيل–١ Operating Systems-1	٣	٢	٢	Computer Programming-1 CS132
CS251	هندسة البرمجيات – ١ Software Engineering-1	٣	٢	٢	Computer Programming-2 CS233
IS251	تصميم وتطوير الويب Web Design and Development	٣	٢	٢	Computer Programming-1 CS132

رقم المقرر	اسم المقرر	الساعات المعتمدة	محاضرة	تمارين/ عملي	المتطلب السابق
IS221	نظم قواعد البيانات-١ Database Systems-1	٣	٢	٢	Data Structure CS212
OD342	النمذجه والمحاكاه Modeling & Simulation	٣	٢	٢	Introduction to Operation Research & Decision Support OD213
IT211	شبكات الحاسبات-١ Computer Networks-1	٣	٢	٢	Introduction to Electronics IT181
	الإجمالي	٦٦	٤٤	٤٤	-

(ب) المتطلبات الاختيارية ٦ ساعات معتمدة

رقم المقرر	اسم المقرر	الساعات المعتمدة	محاضرة	تمارين / عملي	المتطلب السابق
CS313	تحليل وتصميم الخوارزميات Analysis and Design of Algorithms	٣	٢	٢	Systems Analysis & Design -1 IS212
MA213	رياضيات-٣ Mathematics-3	٣	٢	٢	Mathematics-2 MA112
CS232	تنظم ومعالجة الملفات File Organization and Processing	٣	٢	٢	Data Structure CS212
ST291	طرق إحصائية Statistical Methods	٣	٢	٢	Statistics & Probabilities ST190
OD251	نظم دعم القرار وتطبيقاتها Operation Research Systems & Applications	٣	٢	٢	Introduction to Operation Research & Decision Support OD213
IT383	برمجة علمية Scientific Programming	٣	٢	٢	Computer Programming-2 CS233
IT384	خدمات الويب Web Services	٣	٢	٢	Web Design and Development IS251
IS324	برمجة تطبيقات قواعد البيانات Database Application Programming	٣	٢	٢	Database Systems-1 IS221
IS373	الأعمال الإلكترونية E-Business	٣	٢	٢	Introduction to IS IS111

مادة (٢٦) متطلبات الاقسام العلمية

(أ) قسم علوم الحاسب

المقررات الإجبارية (٣٩ ساعة معتمدة)

رقم المقرر	اسم المقـرر	الساعات المعتمدة	محاضرة	تمارين / عملي	المتطلب السابق
CS321	الذكاء الاصطناعي Artificial Intelligence	٣	٢	٢	Computer Programming – 2 CS233
CS352	هندسة البرمجيات-٢ Software Engineering-2	٣	٢	٢	Software Engineering-1 CS251
CS362	نظم تشغيل-٢ Operating Systems-2	٣	٢	٢	Operating Systems-1 CS261
CS334	برمجه حاسبات -٣ Computer Programming - 3	٣	٢	٢	Computer Programming – 2 CS233
CS424	نظم قواعد المعرفة Knowledge Based Systems	٣	٢	٢	Artificial Intelligence CS321
CS323	تعلم الآله Machine learning	٣	٢	٢	Artificial Intelligence CS321
CS442	النظم الموزعة Distributed Systems	٣	٢	٢	Operating Systems-2 CS362
CS471	بناء المترجمات Compiler Design	٣	٢	٢	Computer Programming -3 CS334
CS472	معالجة اللغات الطبيعية Natural Language processing	٣	٢	٢	Artificial Intelligence CS321
CS443	البرمجة المتوازية Parallel Programming	٣	٢	٢	Computer Programming – 3 CS334
CS415	أمن الحاسب Computer Security	٣	٢	٢	Computer Networks-1 IT211
CS482	المشروع Project	٦	٣	٦	

المقررات الاختيارية (٢٤ ساعة معتمدة)

من بين المقررات الاختيارية التالية و من بين مقررات الأقسام الأخرى بحد أقصى (٩) ساعة.

رقم المقرر	اسم المقـرر	الساعات المعتمدة	محاضرة	تمارين / عملي	المتطلب السابق
CS336	المعالجات الدقيقة ولغة التجميع Microprocessors and Assembly language	٣	٢	٢	Introduction to Electronics IT181
CS322	الذكاء الاصطناعى المتقدم Advanced Artificial Intelligence	٣	٢	٢	Artificial Intelligence CS321
CS314	اللغات الشكلية ونظرية الآليات Formal Languages and Automata Theory	٣	٢	٢	Computer Programming – 2 CS233
CS341	حسابات الإنترنت Internet Computing	٣	٢	٢	Computer Programming –2 CS233
CS437	برمجه حاسبات متقدمة Advanced Computer Programming	٣	٢	٢	Computer Programming -3 CS334
CS473	اتصال الإنسان بالحاسب Human Computer Interaction	٣	٢	٢	Software Engineering-2 CS352
CS474	تعريب الحاسبات Computer Arabization	٣	٢	٢	Computer Programming – 3 CS334
CS438	برمجة تطبيقات المحمول Mobile Application Programming	٣	٢	٢	Computer Programming – 3 CS334
CS425	برمجة الالعاب Game Programming	٣	٢	٢	Computer Programming – 3 CS334
CS463	الانظمة المدمجة Embedded Systems	٣	٢	٢	Operating Systems-2 CS362
CS426	الكائنات الآلية Robotics	٣	٢	٢	Artificial Intelligence CS321
IS435	حوسبة سحابية Cloud Computing	٣	٢	٢	نظم تشغيل -١ CS261
IS469	المعلوماتية الحيوية Bioinformatics	٣	٢	٢	Machine learning CS323
CS485	موضوعات مختارة-١ Selected Topics in CS -3	٣	٢	٢	Computer Programming – 3 CS334

(ب) قسم تكنولوجيا المعلومات

المقررات الإجبارية(٣٩ ساعة معتمدة)

رقم المقرر	اسم المقـرر	الساعات المعتمدة	محاضرة	تمارين / عملي	المتطلب السابق
IT312	شبكات الحاسبات-٢ Computer Networks-2	٣	٢	٢	Computer Networks-1 IT211
IT341	الرسم بالحاسب-١ Computer Graphics-1	٣	٢	٢	Mathematics-2 MA112
IT321	معالجة الصور-١ Image Processing-1	٣	٢	٢	Digital Signal Processing IT371
IT313	شبكات الحاسبات-٣ Computer Networks-3	٣	٢	٢	Computer Networks-2 IT312
IT371	معالجة الإشارات الرقمية Digital Signal Processing	٣	٢	٢	Mathematics-2 MA112
IT431	التعرف على الانماط-١ Pattern Recognition-1	٣	٢	٢	Image Processing-1 IT321
IT422	الرؤية بالحاسب-١ Computer Vision-1	٣	٢	٢	Pattern Recognition-1 IT431
IT472	التعرف على الكلام-١ Speech Recognition-1	٣	٢	٢	Digital Signal Processing IT371
IT451	التطوير المتقدم للويب Advanced Web Development	٣	٢	٢	Web Design and Development IS251
IT444	الواقع الافتراضي-١ Virtual Reality-1	٣	٢	٢	Computer Graphics-1 IT341
IT416	الشبكات اللاسلكية والمحمولة Wireless and Mobile Networks	٣	٢	٢	Computer Networks-2 IT312
IT486	المشروع Project	٦	٣	٦	

المقررات الاختيارية (٢٤ ساعة معتمدة)

من بين المقررات الاختيارية التالية و من بين مقررات الأقسام الأخرى بحد أقصى (٩) ساعة.

رقم المقرر	اسم المقـرر	الساعات المعتمدة	محاضرة	تمارين / عملي	المتطلب السابق
IT342	الرسم بالحاسب-٢ Computer Graphics-2	٣	٢	٢	Computer Graphics-1 IT341

IT362	الوسائط المتعددة–٢ Multimedia-2	٣	٢	٢	Multimedia-1 IT261
IT314	نظم تشغيل الشبكات Network Operating Systems	٣	٢	٢	Operating Systems-1 CS261
IT343	الرسوم المتحركة Animations	٣	٢	٢	Computer Graphics-1 IT341
IT315	إدارة وتحليل الشبكات Network Management and Analysis	٣	٢	٢	Computer Networks-2 IT312
IT417	برمجة الشبكات Network Programming	٣	٢	٢	Computer Networks-1 IT211
IT418	تأمين الشبكات Network Security	٣	٢	٢	Computer Networks-2 IT312
IT487	تطبيقات تكنولوجيا المعلومات Information Technology Applications	٣	٢	٢	Image Processing-1 IT321
IT485	موضوعات مختارة – ١ Selected Topics in IT - 1	٣	٢	٢	Computer Networks-2 IT312
IT486	نظم الاشارات الرقمية Digital Signal Systems	٣	٢	٢	Computer Networks-2 IT312
IS435	حوسبة سحابية Cloud Computing	٣	٢	٢	نظم تشغيل –١ CS261

(ج) قسم نظم المعلومات

المقررات الإجبارية ٣٩ (ساعة معتمدة)

رقم المقرر رقم المقرر	اسم المقرر اسم المقرر	الساعات المعتمدة الساعات المعتمدة	محاضرة محاضرة	تمارين / عملي تمارين / عملي	المتطلب السابق المتطلب السابق
IS322	نظم قواعد البيانات-2 Database Systems-2	٣	٢	٢	نظم قواعد البيانات – ١ IS221
IS312	تحليل وتصميم نظم -2 Systems Analysis and Design -2	٣	٢	٢	تحليل وتصميم نظم -1 IS212
IS331	ذكاء الأعمال Business Intelligence	٣	٢	٢	نظم قواعد البيانات – 2 IS322
IS355	إسترجاع المعلومات Information Retrieval	٣	٢	٢	نظم قواعد البيانات – ١ IS221
IS463	أمان المعلومات Information Security	٣	٢	٢	رياضيات – ٢ MA112
IS426	نظم قواعد بيانات حديثة Modern Database Systems	٣	٢	٢	نظم قواعد البيانات – 2 IS322
IS465	تنقيب البيانات Data Mining	٣	٢	٢	نظم قواعد البيانات – 2 IS322
IS433	إدارة البيانات الموزعة Distributed Data Management	٣	٢	٢	نظم قواعد البيانات – 2 IS322
IS435	حوسبة سحابية Cloud Computing	٣	٢	٢	نظم تشغيل -١ CS261
IS449	بنية الشركات Enterprise Architecture	٣	٢	٢	مقدمة نظم المعلومات IS111
IS462	نظم المعلومات الجغرافية Geographic IS	٣	٢	٢	نظم قواعد البيانات – 2 IS322
IS485	مشروع Project	٦	٣	٦	-

المقررات الاختيارية (٢٤ ساعة معتمدة)

من بين المقررات الاختيارية التالية و من بين مقررات الأقسام الأخرى بحد أقصى (٩) ساعة.

IS341	أنظمة الشركات Enterprise Resource planning	٣	٢	٢	الأعمال الإلكترونية IS373
IS343	استراتيجيات وإدارة واكتساب نظم المعلومات IS Strategy, Management & Acquisition	٣	٢	٢	مقدمة نظم المعلومات IS111
IS375	نظم معلومات الويب Web Information Systems	٣	٢	٢	تصميم و تطوير الويب IS251
IS361	نظم المعلومات الذكية Intelligent IS	٣	٢	٢	الذكاء الاصطناعى CS371
IS371	نظم معلومات الوسائط المتعددة والمكتبات الرقمية Multimedia IS & Digital Libraries	٣	٢	٢	وسائط متعددة -١ IT261
IS437	إدارة العمليات التجارية Business Process Management	٣	٢	٢	الأعمال الإلكترونية IS373
IS445	إدارة مشروعات نظم المعلومات IS Project Management	٣	٢	٢	إدارة المشروعات OD332
IS447	إدارة المعرفة Knowledge Management	٣	٢	٢	تنقيب البيانات IS465
IS467	المعلوماتية المجتمعية Social Informatics	٣	٢	٢	نظم قواعد البيانات – 2 IS322
IS469	المعلوماتية الحيوية Bioinformatics	٣	٢	٢	تنقيب البيانات IS465
IS479	نظم معلومات مبتكرة وتكنولوجيا جديدة IS Innovation and New Technologies	٣	٢	٢	تنقيب البيانات IS465
IS381	موضوعات مختارة -١ Selected Topics in IS -1	٣	٢	٢	-
IS482	البيانات الضخمة Big Data	٣	٢	٢	نظم قواعد البيانات – 2 **IS322**
IS483	علوم البيانات Data Science	٣	٢	٢	نظم قواعد البيانات – 2 **IS322**

(د) قسم بحوث العمليات ونظم دعم القرار

المقررات الإجبارية(٣٩ ساعة معتمدة)

رقم المقرر	اسم المقـرر	الساعات المعتمدة	محاضرة	تمارين / عملي	المتطلب السابق
OD321	ادارة مشروعات Projects Management	٣	٢	٢	مقدمة فى بحوث العمليات ودعم القرار OD211
OD331	البرمجة الخطية و الصحيحة Linear and Integer Programming	٣	٣	٣	مقدمة فى بحوث العمليات ودعم القرار OD211
OD251	نظم دعم القرار وتطبيقاتها Decision support Systems & Applications	٣	٢	٢	مقدمة فى بحوث العمليات ودعم القرار OD211
OD332	البرمجة غير الخطية والديناميكية Dynamic & Nonlinear Programming	٣	٣	٣	البرمجة الخطية و الصحيحة OD331
OD341	النماذج العشوائية Stochastic Models	٣	٢	٢	النمذجه والمحاكاه OD241
OD451	نظرية القرارات و المباريات Decision and Game Theory	٣	٣	٣	رياضيات-MA112٢ إحصاء واحتمالات ST190
OD431	البرمجة متعددة الاهداف Multi-objective Programming	٣	٢	٢	البرمجة غيرالخطية والديناميكية OD332
OD452	الادارة الاستراتيجية وادارة الازمات Strategic Management and Crisis Management	٣	2	2	النمذجه والمحاكاه OD241
OD453	مراقبة المخزون وادارة الانتاج Inventory Control and Production Management	٣	٢	٢	نظم دعم القرار وتطبيقاتهاOD251 البرمجة الخطية و الصحيحة OD331
OD454	نظم المعلومات الجغرافية لدعم القرار Geographic Information Systems for Decision Support	٣	2	2	نظم دعم القرار وتطبيقاتها OD251 نظم قواعد البيانات-١ IS221
OD 455	التنبؤ وتحليل التوقعات Forecasting and predictive Analysis	3	2	2	نظم دعم القرار وتطبيقاتهاOD251
OD471	المشروع Project	6	٣	٦	-

المقررات الاختيارية (٢٤ ساعة معتمدة)

من بين المقررات الاختيارية و من بين مقررات الأقسام الأخرى بحد أقصى (٩) ساعة.

رقم المقرر	اسم المقـرر	الساعات المعتمدة	محاضرة	تمارين / عملي	المتطلب السابق
OD322	ادارة مشروعات متقدمة Advanced Project Management	٣	٢	٢	ادارة مشروعاتOD321
OD371	استراتيجية حل المشاكل Problem Solving Strategies	٣	٢	٢	Mathematics-2 Ma112
OD372	لغات الحاسب فى النمذجة وبحوث العمليات Computer Languages for Modeling and OR	٣	٢	٢	نظم دعم القرار وتطبيقاتهاOD251 البرمجة الخطية و الصحيحةOD331
OD342	النمذجة والمحاكاة المتقدمة Advanced Modeling and Simulation	٣	٢	٢	النمذجه والمحاكاه OD241
OD343	نظم صفوف الانتظار Queuing Systems	٣	٢	٢	إحصاء واحتمالاتST190
OD352	إدارة اللوجستيات Logistics Management	٣	٢	٢	مباديء ادارة OD112
OD353	التحليل الإحصائي لدعم القرار Statistical Analysis for DS	٣	٢	٢	مقدمة فى بحوث العمليات ودعم القرارOD211 طرق احصائية ST291
OD455	إدارة البيانات فى دعم القرار Data Management in DS	٣	٢	٢	نظم قواعد البيانات-١IS221
OD456	نظم دعم القرار المعرفية Knowledge Based DSS	٣	٢	٢	نظم قواعد البيانات- ١IS221 الحسابات الذكية لدعم القرار
OD432	أمثلية الشبكات Network Optimization	٣	٢	٢	البرمجة غير الخطية والديناميكيةOD332
OD457	إدارة المخاطر Risk Management	٣	٢	٢	مراقبة المخزون وادارة الانتاجOD453
OD472	البرمجة العشوائية Stochastic Programming	٣	٢	٢	النماذج العشوائيةOD341
OD462	موضوعات متقدمة فى الحاسبات الذكية Advanced Topics in Intelligent Computational	٣	٢	٢	الحسابات الذكية لدعم القرارOD461
OD381	موضوعات مختارة –١ Selected Topics in DS -1	٣	٢	٢	مقدمة فى بحوث العمليات ودعم القرار OD211
OD481	نمذجة النظم الديناميكية System Dynamics Modeling	٣	٢	٢	مقدمة فى بحوث العمليات ودعم القرارOD211

OD482	اتخاذ القررات الاستراتجية Strategic Decision Making	٣	٢	٢	مقدمة فى بحوث العمليات ودعم القرار OD211

محتوى المقرارت للأقسام

أولاً: توصيف مقررات العلوم الأساسية

GN170	**English Language-1** لغة انجليزية-١ The course gives practice in specific points of grammar to consolidate and extend a learner's existing knowledge, analysis of syntax, comprehension questions interpretation and implication, the activities and games used to develop listening, speaking and writing skills through a communicative, functional approach with suggested topics for discussion and exercises in summary writing and composition. Topics covered include: Learning Vocabulary and Word Formation through the use of a Dictionary, Verb Tenses and Subject-Verb Agreements, Conditionals, Modals, Active vs Passive, Gerunds and Infinitives, Sentence Structure, and Punctuation.
MA111	**Mathematics-1** رياضيات-١ The main objective of this course is to provide students with pre-calculus review. Sets. Real-valued function. The continuity and the differentiability of a real function. Techniques of differentiation. Derivatives of the trigonometric functions. Implicit differentiation. Linear approximations and differentials. Applications of the derivative: Extreme of functions, optimization problems, velocity and acceleration. Integrals: Indefinite integrals, change of variables, definite integrals, the fundamental theorem of calculus, numerical integration. Applications of definite integrals: Areas, solids of revolution, arc length and surfaces of revolution, work, moments and centers of mass. Transcendental functions: Derivative of inverse function, natural logarithm function, exponential functions, inverse trigonometric functions, hyperbolic and inverse hyperbolic functions, indeterminate forms and rule.
MA112	**Mathematics-2** رياضيات-٢ The main objective of this course is to provide students with understanding techniques of integration: Integration by parts, trigonometric integrals and substitutions, integrals of rational functions, quadratic expressions, tables of integrals, improper integrals. Infinite series: Sequences, convergent or divergent series, positive-term series (basic comparison test, limit comparison test, ratio and root tests), alternating series and absolute convergence, power series, power series representations of functions, Maclaurin and Taylor series, applications of Taylor polynomials. Differential equations: Definition, classifications and terminology, techniques of solution of ordinary first-order first-degree differential equations (separable, reducible to separable, homogeneous, reducible to homogeneous, linear, reducible to linear, exact differential, nonexact differential-integrating factor), applications.
ST190	**Statistics & Probabilities** إحصاء واحتمالات

	The main objective of this course is to provide students with understanding sample space, probability axioms, combinatorial techniques, conditional probability, independence and Bayes' theorem. Random variables; distribution functions, moments and generating function. Some probability distributions. Joint distribution, the Chebychev inequality and the law of large numbers. The central limit theorem and sampling distributions.
MA213	**Mathematics-3** رياضيات-٣ The main objective of this course is to provide students with understanding of linear algebra, Matrix Algebra, system of linear equations, vector spaces, vector algebra, orthogonalization and Linear transformation, Eigen values and eigen vector, Diagonalization, function of a matrix, ordinary differential equation, linear and non-liner differential equation, solution of a differential equations, high order differential equations, applications of first order differential equations, Growth and decay and newton's law of cooling, special functions, partial differential equations, numerical analysis, complex variables.

ثانياً: توصيف مقررات قسم علوم الحاسب

CS110	**Semiconductors** أشباه الموصلات The main objective of this course is to provide students with understanding Energy bands. Electrons and holes. Extrinsic semiconductors. Structure and current voltage characteristics of a p-n junction. Diode. Possible circuits. Rectifier circuits. Half wave rectifier. Full wave rectifier. Bridge rectifier. Voltage doubler. Filters. Zener diodes and regulators. Junction transistors. Digital Circuits, Inverter Characteristics and Circuits, Gates (AND/NAND, OR/NOR)
CS111	**Computer Introduction** مقدمة فى الحاسبات The main objective of this course is to provide students with a general introduction to the basics of computer sciences and its different fields. The course may cover topics like: Digital revolution, digital devices, personal computers, servers, mainframes, super computers, microcontrollers, representing numbers, text, and pictures, quantifying bits and bytes, programs and instruction sets, microprocessor basics, RAM, ROM, EEPROM, magnetic disk and tape storage, CD and DVD storage, solid state storage, storage wrap-up, display devices, printers, system software, application software, utilities and device drivers, popular applications, software copyrights and licenses, software updates, operating system activities, network classifications, network devices, clients, servers, and peers, wired networks, wireless networks, Internet services, fixed, portable, and mobile Internet access, Internet infrastructure, Internet protocols, addresses, and domains, hardware security, software security, Internet security, number systems.
CS131	**Principles of Programming** مبادئ برمجة The main objective of this course is to provide students with computer programming, programming languages and generations, programming life cycle, programming errors,

	problem solving techniques, what is algorithm, algorithm representation (Pseudo code), sequential operations, conditional operations, iterative operations, what is flowchart, flowchart notations, program construction, constants, variable declarations, simple data types, input statement, output statement, formatting output, arithmetic expressions, control structures, conditions, selection structures, repetition and loop statements, library functions, user-defined functions, function arguments, array declarations, array subscripts, array operations, array sorting and searching, multidimensional arrays.
CS132	**Computer Programming – 1 (Fundamental of Programming)**
	برمجة حاسبات – ١
	The main objective of this course is to provide students with the basic concepts and techniques of computer programming. It includes an introduction to problem solving for programming, primitive data types and expressions, variables and constants, basic input and output, conditional statements, repetition, methods, arrays, strings, file I/O and exception handling.
CS212	**Data Structure**
	هياكل بيانات
	The main objective of this course is to provide students with simple numerical algorithms, Sequential and binary search algorithms, Worst case quadratic sorting algorithms (selection, insertion), Worst or average case O(N log N) sorting algorithms (quicksort, heap sort, merge sort), Hash tables, including strategies for avoiding and resolving collisions, Binary search trees, Graphs and graph algorithms, Heaps, Pattern matching and string/text algorithms (e.g., substring matching, regular expression matching, longest common subsequence algorithms).
CS232	**File organization**
	Introduction to File Organization and Management- Definition of File Management and Organization- Components of a File- File Types- Modes of access- File Operations - File Storage Devices Components of Storage Devices- Types of Storage Media- Types of Storage Devices- Sequential File Organization- Indexed Sequential File Organization- Relative File Organization- Multi-Key File Organization-
CS233	**Computer Programming – 2 (OO Programming)**
	برمجة حاسبات – 2
	The main objective of this course is to provide students with the object-oriented programming concepts. It includes topics such as defining and using classes, classes and objects, constructors and destructors, objects as function arguments, returning objects from functions, inheritance, multiple inheritance, super-classes and subclasses, creating and using interfaces, abstract classes and methods, final methods and classes, polymorphism, encapsulation, information hiding.
CS251	**Software Engineering-1**
	هندسة البرمجيات – ١
	The main objective of this course is to provide students with the introduction of software engineering, Software processes, software development techniques, Requirements engineering, System models, and software prototyping. Architectural design, Design and implementation, Software testing, Software evolution.
CS261	**Operating Systems-1**
	نظم تشغيل-١

	The main objective of this course is to provide students with the introduction to Operating Systems, User view and system view of Operating Systems, Basic concepts of processes, Process Scheduling, Memory Management Concurrency, File Systems Management, and Input/output Management.
CS313	**Analysis and Design of Algorithms**
	تحليل وتصميم الخوارزميات
	The main objective of this course is to provide students with the 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. Backtracking. NP-hard and NP-complete problems.
CS314	**Formal Languages and Automata Theory**
	اللغاتالشكليةونظريةالآليات
	The main objective of this course is to provide students with 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.
CS321	**Artificial Intelligence**
	الذكاء الاصطناعي
	The main objective of this course is to provide students with the introduction 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.
CS322	**Advanced AI**
	الذكاء الاصطناعى المتقدم
	The main objective of this course is to provide students with advanced topics in AI such as logic and conceptualize the differences between propositional logic, first-order logic, fuzzy logic, and default logic. After learning about statistical tools commonly used in AI and about the basic symbol system used to represent knowledge, we will focus on artificial neural network and machine learning, which are essential components of computational and

	statistical methods, and theoretical computer science. The course will then conclude with a study of the Turing machine and a discussion of the questionable claims that human thinking is a symbol manipulation.
CS323	**Machine Learning** تعليم الآلة This course examines the design, implementation, and analysis of machine learning algorithms. It covers examples of supervised learning algorithms (including decision tree learning, support vector machines, and neural networks), unsupervised learning algorithms (including k-means and expectation maximization), and optionally reinforcement learning algorithms (such as Q learning and temporal difference learning). It introduces methods for the evaluation of learning algorithms, as well as topics in computational learning theory.
CS334	**Computer Programming –3 (UI Programming)** برمجة حاسبات – ٣ This course aims to understand stages of the user interface life cycle including design, implementation, and evaluation. The course covers user interface design-implementation cycle, rapid prototyping (sketching and evaluating interfaces quickly), advanced interface technologies (speech and handwriting recognition, and intelligent interfaces), interfaces for disabled users, and interface evaluation (user studies and cognitive models).
CS335	**Logic Programming** البرمجة المنطقية The main objective of this course is to provide students with the clausal representation of data structures and algorithms, Unification, Backtracking and search, Cuts. The reference point for the course is the Prolog programming language, a principal aim being to develop students programming expertise through experience in typical applications. The course is divided into two interacting sections: a theory section and a programming section.
CS336	**Microprocessors Assembly language** المعالجات الدقيقة ولغة التجميع The main objective of this course is to provide students with the architectures and design concepts for computer systems, fundamental of microprocessors, assembly-language programming, microcomputer systems, and hardware interface. This course provides the programming techniques, design techniques of memory system, input/output system and hardware interfaces for a simple microprocessor system. And subroutines to include such concepts as screen manipulating, table searching, disk processing, calling assembly language subroutines, communicating with programs written in higher-level languages, debugging techniques and machine language execution, interrupt and Direct Memory Access and fundamental knowledge to program a microprocessor system for specific application.
CS341	**Internet Computing** حسابات الإنترنت The main objective of this course is to provide students with a foundational understanding of the technologies of Internet Computing. The course includes the concepts, principles, methods, and techniques for designing and building internet-enabled systems that uses the web as the basic transport infrastructure. In particular, students will learn about the evolving Internet computing paradigm and the technologies that enable such change. Emphasis will be placed on internet as a domain for sharing resources with grids, distributed computing with web services, and the service-oriented computing.

CS352	**Software Engineering-2**
	هندسة البرمجيات-٢
	The main objective of this course is to provide students with the critical systems: dependability, critical systems specification, critical systems development. Security engineering, Distributed software engineering, Project management, Quality management, Process improvement. Configuration management.
CS362	**Operating Systems -2**
	نظم تشغيل-٢
	The main objective of this course is to provide students with the Deadlocks, Distributed processing, Security and Protection, Real Time and Embedded Systems, System Performance Evaluation, Fault Tolerance.
CS415	**Computer Security**
	أمن الحاسب
	The main objective of this course is to provide students with the Basic Cryptography Terminology, Cipher types, Mathematical Preliminaries essential for cryptography, Cryptographic primitives: Symmetric key cryptography Public key cryptography: Authenticated key exchange protocols, Cryptographic protocols: Motivate concepts using real-world applications, Security definitions and attacks on cryptographic primitives: Cryptographic standards and references implementations, Quantum cryptography.
CS424	**Knowledge Based Systems**
	نظم قواعد المعرفة
	The main objective of this course is to provide students with the essential topics concerning systems that use significant knowledge of an application domain. These systems are referred to as Knowledge-based systems (KBSs). The course first briefly introduces fundamental concepts associated with KBSs and some of the established types of KBSs including expert systems, neural networks and case-based reasoning systems. The course then deals with the major phases of the knowledge engineering process including knowledge acquisition, knowledge representation and reasoning. The course afterwards looks at methodologies designed to support the development of KBSs. The course also introduces a topic on one of the main challenges for KBSs that is dealing with uncertainty. Finally, the course explores the combination of different types of KBSs in form of hybrid KBSs with the aim of having the KBSs complement each other by dealing with weaknesses of each other.
CS425	**Game Programming**
	برمجة الالعاب
	The main objective of this course is to provide students with the Introduction of Game Programming, This is an introductory course in programming, designed to teach the fundamentals. Emphasis is on object orientation. Objects will be used to create a series of typical simple games. Also the course will introduce the student to game engine and programming 2D games. Games with features such as scrolling backgrounds, collision detection, sprite sheets, scoring and menus will be built in game engine. Additional programming language features will be covered, including generic lists and exception handling.
CS426	**Robotics**
	الكائنات الآلية
	The main objective of this course is to provide students with the fundamental concepts of

	robotics and architectures and design concepts for Robotic systems, Topics include how robots move, sense, and perceive the world around them. The course introduces also constructing, planning and programming robots ability to Sensing, controlling, remote control and testing using computer languages for communication and advanced Input / Output programming for system practical programming and harmonious programming and fundamental knowledge to program a robotic system for specific applications.
CS437	**Advanced Computer Programming (Advanced Mobile Applications Development)**
	برمجه حاسبات متقدمة
	The main objective of this course is to provide students with the advanced user interface issues and techniques; animation; structuring and organizing complex applications for efficiency and reliability; accessing web services; integrating with 3rd party libraries; background applications; content providers; and tying into and replacing applications which came with the device. The course centers around building several small applications which focuses on advanced techniques. In these applications we will utilize and effectively integrate specific features of mobile devices such as the user interface, process creation and life cycle events, local and remote process services, location based facilities, accelerometer and other on-device sensors, network/web access, sound and multimedia. Throughout the course test-based development methods will be stressed and students will learn to test and debug their applications.
CS438	**Mobile Application programming**
	برمجة تطبيقات المحمول
	The main objective of this course is to provide students with the principles of mobile application design and development. Students will learn application development on the Android platform. Topics will include memory management; user interface design; user interface building; input methods; data handling; network techniques and URL loading; and, finally, specifics such as GPS and motion sensing. Students are expected to work on a project that produces a professional-quality mobile application. Projects will be deployed in real-world applications. Course work will include project conception, design, implementation, and pilot testing of mobile phone software applications, using weight loss and physical activity motivation health applications as the target domain.
CS442	**Distributed Systems**
	النظم الموزعة
	The main objective of this course is to provide students with the main principles underlying distributed systems: processes, communication, naming, synchronization, consistency, fault tolerance, and security. Additionally, students will be familiar with some of the main paradigms in distributed systems: object-based systems, file systems, web-based and coordination-based systems. On the completion of the unit, students will understand the fundamentals of distributed computing and be able to design and develop distributed systems and applications.
CS443	**ParallelProgramming**
	البرمجة المتوازية
	The main objective of this course is to provide students with the mathematical models, methods and technologies of parallel programming for multiprocessor systems. This course includes the following topics: overview of parallel system architecture, modeling and analysis of parallel computations, communication complexity analysis of parallel algorithms, parallel

	programming for multi-processing, principles of parallel algorithm design, parallel algorithms for solving time consuming problems, and modeling the parallel program executing.
CS463	**Embedded system**
	الانظمة المطمورة
	The main objective of this course is to provide students with the embedded system, Basics of designing, Interfacing with the physical world, Configuring, Programming embedded systems, Models of computation, Basic analysis, control, and systems simulation: Mapping to embedded platforms, Distributed embedded systems.
CS471	**Compiler Design**
	بناء المترجمات
	The main objective of this course is to provide students with the structure of compiler, lexical analysis, lexical patterns, deterministic & Nondeterministic finite automata, scanner, construction, limits of regular languages. Derivations, parse trees, Parsing algorithms: top-down parsing, bottom-up parsing, LL-parsers, LR-parsers. Semantic analysis. Intermediate code generation. Error detection and error handling.و and code optimization.
CS472	**Natural Language Processing**
	معالجة اللغات الطبيعية
	The main objective of this course is to provide students with the introduction to the field of computational linguistics and the theory and methods of natural language processing (NLP). We will learn how to create systems that can understand and produce human language, for applications such as information extraction, machine translation, automatic summarization, question-answering, and interactive dialogue systems. The course will cover linguistic (knowledge-based) and statistical approaches to language processing in the three major subfields of NLP: syntax (language structures), semantics (language meaning), and pragmatics/discourse (the interpretation of language in context). Analyzing and extracting information from large online corpora.
CS473	**Human-Computer Interaction (HCI)**
	اتصال الإنسان بالحاسب
	The main objective of this course is to provide students with the design interactions between human activities and the computational systems that support them and with constructing interfaces to afford those interactions. Interaction between users and computational artefacts occurs at an interface that includes both software and hardware. Thus interface design impacts the software life-cycle in that it should occur early; the design and implementation of core functionality can influence the user interface– for better or worse. Because it deals with people as well as computational systems, as a knowledge area HCI demands the consideration of cultural, social, organizational, cognitive and perceptual issues. Consequently it draws on a variety of disciplinary traditions, including psychology, ergonomics, computer science, graphic and product design, anthropology and engineering. For end-users, the interface is the system. So design in this domain must be interaction-focused and human-centered. Students need a different repertoire of techniques to address this than is provided elsewhere in the curriculum. CS students need a minimal set of well-established methods and tools to bring to interface construction. To take a user-experience-centered view of software development and then cover approaches and technologies to make that happen. An exploration of techniques to ensure that end-users are fully considered at all stages of the design process, from inception to implementation.

CS474	**Computer Arabization** تعريب الحاسبات The main objective of this course is to provide students with the System Arabization level (screen Arabization, keyboard Arabization, printer Arabization, font and code manipulation, creating Arabic interfaces, etc.); Introduction to Arabic natural language processing (Arabic morphological analysis, Arabic syntax and semantics, models, applications); Applying artificial intelligence in Arabic natural language processing as Arabic morphological analysis, syntactic analysis and the phonetic properties of the Arabic language. Use Arabic language in some computer applications.
CS482	**Project** المشروع This component is final year B.Sc project, which is essentially an exercise in systematic independent study and work, which must be executed and reported on to a satisfactory standard. The project provides students with the experience of planning and bringing to fruition a major piece of individual or group work. The module aims to encourage and reward creativity, initiative, intellectual discipline, clarity of communicating ideas and application of effort. Group projects also give the students a valuable experience of co-coordinating work with and organizing a group that aims at a technical product. A wide range of tasks can be undertaken, but almost always leading to the implementation of an information system, software or other information technology artifact. In some cases, students will do not have the time to produce an industrial-strength application; in these cases, a prototype that is systematically and fully evaluated and documented will be required.
CSx8x	**Selected Topics in Computer Science** موضوعات مختارة في نظم المعلومات This course aims at introducing students to novel topics in computer science 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.

ثالثاً: توصيف مقررات قسم تكنولوجيا المعلومات

IT181	**Introduction to Electronics** مقدمة إلكترونيات The course will focus on the application to electrical physics world through exploratory investigation and activities. Students will be provided experiences to develop and enhance problem-solving skills, critical thinking skills, reasoning, graphical analysis, data collection and interpretation of data as well as the application of mathematics. Topics covered include: Ideal Basic circuit elements, Kirchhoff's law, Node voltage method, Mesh current method, circuit theorem overview, Thévenin and Norton equivalent circuits, capacitor and capacitance, and AC analysis. Introduction to digital electronics, Number Systems, Logic Gates, The Karnough Map, Design an SR Latch, Flip-Flops, Clocks and Oscillators, Design a 4-bit Shift Register, Design a 4-bit Counter, Design an LED Shifter, 7400 Series Logic Devices, 4000 Series Logic Devices.
IT211	**Computer Networks-1**

	شبكات الحاسبات-١
	This course introduces the fundamentals of networking concepts and technologies. The course topics include: exploring the network, network protocols and communications, network access layer, Ethernet, network layer, transport layer, ipv4 and ipv6 addressing, subletting ip networks, and application layer. The course will assist students in developing the skills necessary to plan and implement small networks across a range of applications.
IT261	**Multimedia-1**
	الوسائط المتعددة-١
	In this course, different aspects related to multimedia systems design and development is introduced. Topics to be covered in this course include: Introduction to multimedia data and multimedia systems, multimedia revolution and its possible future, multimedia content creation which includes digital data acquisition and simple processing, media representation and media formats (include text, digital images and graphics, digital video, digital audio and animation), multimedia authoring, authoring tools, intera- and inter-media processing, multimedia authoring paradigms and user interfaces, and finally several cases of multimedia systems and their design requirements will be discussed.
IT282	**Computer Organization**
	تنظيم الحاسبات
	In This course student will study organization of a simple stored-program computer: CPU, busses and memory. Instruction sets, machine code, and assembly language. Conventions for assembly language generated by compilers. Floating-point number representation. Hardware organization of simple processors. Address translation and virtual memory. Very introductory examples of input/output devices interrupt handling and multi-tasking systems. Basic understanding of computer organization: roles of processors, main memory, and input/output devices. Understanding the concept of programs as sequences of machine instructions. Understanding the relationship between assembly language and machine language; development of skill in assembly language programming; understanding the relationship between high-level compiled languages and assembly language. Understanding arithmetic and logical operations with integer operands. Understanding floating-point number systems and operations. Understanding simple data path and control designs for processors. Understanding memory organization, including cache structures and virtual memory schemes. Course include basic machine architecture and design, digital logic circuits, digital components, central processing unit, machine representation of instructions and data, addressing techniques, memory organization, and execution of instructions at machine level.
IT312	**Computer Networks-2**
	شبكات الحاسبات-٢
	This course introduces the concepts of routing and switching data in networks. The course topics include: introduction to switched networks, basic switching concepts, VLAN security, routing concepts, inter-VLAN routing, static routing, dynamic routing, open shortest path first (OSPF) protocol, access control lists, dynamic host configuration protocol, and network address translation for ipv4.
IT313	**Computer Networks-3**
	شبكات الحاسبات-٣
	This course introduces the concepts of scaling up the networks and WAN technologies. The course topics include: Introduction to Scaling Networks, LAN Redundancy, Link

	Aggregation, Wireless terminologies, Multi-area OSPF, Enhanced Interior Gateway Routing Protocol (EIGRP), Hierarchical Network Design, Connecting to the WAN, Point-to-Point Connections, Frame Relay, Broadband Solutions, Securing Site-to-Site Connectivity, and Monitoring the Network.
IT314	**Network Operating Systems**
	نظم تشغيل الشبكات
	This course introduces students to a broad range of Network Operating System (NOS) concepts, including installation and maintenance. The course focus is on Windows Server and Linux Network Operating System concepts include managing and maintaining physical and logical devices, access to resources, the server environment, managing users, computers, and groups; disaster recovery and maintenance. The course cover the following topics: Manage user and group accounts and related system files, Automate system administration tasks by scheduling jobs, maintain system time, system logging, manage printers and printing, fundamentals of internet protocols, basic network configuration, basic network troubleshooting, configure a DNS server to support local recognition of hostnames, configure a DNS server to support a local recognition of hostnames, configure a DHCP server, configure an http server to support web-based document access, configure an ftp server to support remote file access and update, configure the system for file sharing .
IT315	**Network Management and Analysis**
	إدارة وتحليل الشبكات
	The primary purpose of this course is to provide students with fundamental network management principles, and to teach them introductory programming techniques for use with solving common network management problems such as: Managing configuration files & storing log information for multiple network devices, Identifying patterns in network behavior to ensure optimal performance, alerting management when faults or unexpected changes occur within the network, and analyzing current state of security within a network to help prevent & detect compromises. At the end of this course the students are able to demonstrate the purpose of SNMP, Netconf, Netflow & Syslog, proficiency with common network management tools, Analyze network trends with SNMP & Netflow, Create a central logging server using Syslog, Justify the usage of Netconf for configuration management, Show how management information is stored & accessed within a managed object, Describe some of the challenges posed by network management.
IT321	**Image Processing – 1**
	معالجة الصور-١
	This course introduces the basic theories and methodologies of digital image processing. Topics to be covered include: image acquisition and display using digital devices, properties of human visual perception, sampling and quantization, image enhancement, image restoration, two-dimensional Fourier transforms, linear and nonlinear filtering, morphological operations, noise removal.
IT341	**Computer Graphics-1**
	الرسم بالحاسب-١
	Computer Graphics I is a study of the hardware and software principles of interactive raster graphics. Topics include an introduction to the basic concepts, 2-D and 3-D modeling and transformations, viewing transformations, projections, rendering techniques, graphical software packages and graphics systems. Students will use a standard computer graphics API to reinforce

	concepts and study fundamental computer graphics algorithms. The goal of Computer Graphics I is to provide a broad exposure to the computer graphics field in order to be prepared for follow-on study.
IT342	**Computer Graphics-2** الرسم بالحاسب-٢ One of the goals of computer graphics has always been the creation of photorealistic renderings of virtual scenes. The field has always relied on and mimiced photography in attaining this goal. This course will describe the various components of the image synthesis pipeline and explain, just as in photography, how the path of light in a virtual scene can be simulated and used to create beautiful imagery. The course will emphasize the theory behind the various rendering tools and libraries available for image synthesis. The student will have the opportunity to put the theory into practice via a programming assignments and a capstone project. Topics will include light/color, 3D scene specification, camera models, surface materials and textures, rendering (local, ray tracing, radiosity), procedural shading and modeling, tone reproduction, and advanced rendering techniques.
IT343	**Animations** الرسوم المتحركة This course will teach the students about current algorithms and techniques in computer animation. By the end of the course, the students should have learned the computational methods for modeling of motions in the physical and virtual world, be able to storyboard, light, compose, and render an animated sequence, and be able to read and critically evaluate the current literature in computer animation
IT362	**Multimedia-2** الوسائط المتعددة-٢ In this course, different aspects related to multimedia compression and digital rights management are introduced. Topics to be covered in this course include: the basic information theory related to multimedia compression, overview of lossless and lossy compression techniques, Image compression which include lossless image coding (image coding based on run length, and dictionary based image coding (GIF, PNG)) and lossy image coding (transform image coding (JPEG standard) and wavelet-based coding (JPEG2000)), video compression (general theory of video compression and different video coding standards), audio compression (general theory of audio compression and different audio compression standards) and the digital rights management using watermarking and encryption.
IT371	**Digital Signal processing** معالجة الإشارات الرقمية This course covers fundamentals of signal and system analysis. Topics include what is a signal, signal representation, signal and systems, frequency, filtering, classification of signals, periodic and non-periodic signals, operations performed on dependent (amplitude scaling, addition, multiplication, differentiation, integration) and independent variables (time scaling, reflection, time shifting), elementary signals, time domain representations of linear time invariant systems (LTI), convolution, interconnections of LTI systems, discrete-time Fourier transform, continuous-time Fourier transform, Z-transform, analog filter design, Butterworth filter, chebychev filter, elliptic filter, digital filters, IIR and FIR filters.
IT383	**Scientific Programming** برمجة علمية

	Introduction to Scientific Programming was designed to encourage the integration of computation into the science and engineering curricula. The course intended to teach introductory programming while simultaneously preparing students to immediately exploit the broad power of modern computing in their science and engineering courses. First, Computational Science branches will explore the differences among the experimental, theoretical, and computational approaches to science. Second, Programming using symbolic mathematics packages such as Maple can be used. The focus is on the computational properties of numbers, arithmetic and symbolic expressions, programmer-defined functions, and scientific visualization. Then the course introduces procedural, statement-oriented programming to prepare students for the transition to a conventional programming language such as C. Programming concepts are taught in parallel with a computational science problem-solving methodology. Then a variety of computational problems is used from the breadth of science and engineering to interest students and establishes the relevance of the computational problem-solving approach.
IT384	**Web Services**
	خدمات الويب
	This course is concerned with the design, implementation and deployment of web services, covering both business-to-business (B2B) and business-to-consumer (B2C) scenarios. The course covers underlying theory with an emphasis on SOAP based web services and associated standards such as XML, WSDL and UDDI. The course also provides extensive coverage of development using popular open source Java tools such as Apache Tomcat, Axis2 and Derby as well as the Eclipse Development Environment. The study of SOAP based Web Services is complemented by coverage of REST based Web Services and ancillary tools such as JDOM and JSON. This course also looks at developing Java based web applications that consume web services using the Java EE Servlet and JSP APIs, which form the basis of the Apache Axis2 implementation and serve to provide a solid foundation for studying other web based frameworks built upon such technologies. Security is also emphasized at both the web server and service level using both tool specific frameworks (e.g. within Tomcat web server) and standards based security as part of the WS-Security protocol.
IT416	**Wireless and Mobile Communication**
	الشبكات اللاسلكية والمتحركة
	This course is an introduction to the field of mobile communications. The course cover the following topics; Wireless Transmission: Frequencies and regulations; Signals; antennas; signal propagation; MIMO; Multiplexing; Modulation; Spread Spectrum, Medium Access Control: SDMA; FDMA; TDMA; CDMA; CSMA/CA; versions of Aloha; Collision avoidance; polling, Cellular networks: Architecture ; Organization ; Frequency reuse ; Operation ; Functions ; Handoff ; Power control ; First generation mobile networks (AMPS)– Second generation mobile networks (GSM); Third generation mobile networks (UMTS) ; Forth generation (LTE and LTE advanced), Wireless LANs: Wireless LAN standard (IEEE 802.11); Architecture ; Services ; MAC protocols; Bluetooth; ZigBee; Network Protocols: Mobile IP; Locator/Identifier split ; Ad-hoc networking; Routing.
IT417	**Network Programming**
	برمجة الشبكات
	This course addresses development of network applications and software on the Internet. It covers both the TCP/UDP transport layer-programming interface and the methodology of

	design and implementation of real client-server network applications. Upon completion of this course, students will have a good understanding of the TCP/UDP network-programming interface and be able to develop non-trivial robust client-server network applications on the Internet. The topics include Socket address, Elementary TCP and UDP sockets, Design and implementation of some application Layer protocols, and Daemon processes, Reliable UDP communication and Multicasting.
IT418	**Network Security**
	تأمين الشبكات
	The course cover the following topics; Key Management and Distribution: Symmetric Key Distribution Using Symmetric Encryption; Symmetric Key Distribution Using Asymmetric Encryption; Distribution Of Public Keys; X.509 Certificates; Public-Key Infrastructure, User Authentication: Remote User-Authentication Principles; Remote User-Authentication Using Symmetric Encryption; Kerberos; Remote User Authentication Using Asymmetric Encryption; Federated Identity Management, Transport-Level Security: Web Security Considerations; Secure Socket Layer and Transport Layer Security; Transport Layer Security; HTTPS; Secure Shell (SSH, Wireless Network Security: IEEE 802.11i Wireless LAN Security; Wireless Application Protocol (WAP); Wireless Transport Layer Security; WAP End-to-End Security, Electronic Mail Security: Pretty Good Privacy; S/MIME; Domain Keys Identified Mail, IP Security: IP Security Policy; Encapsulating Security Payload; Combining Security Associations; Internet Key Exchange; Cryptographic Suites
IT422	**Computer Vision-1**
	الرؤية بالحاسب-١
	In computer vision, the goal is to develop methods that enable a machine to "understand" or analyze images and videos. This introductory computer vision course covered various fundamental topics in the area including: Filtering, Image Representations, and Texture Models, Color Vision, Multi-view Geometry, Projective Reconstruction, Bayesian Vision; Statistical Classifiers, Clustering & Segmentation, Tracking and Density Propagation, Visual Surveillance and Activity Monitoring.
IT431	**Pattern Recognition-1**
	التعرف على الانماط-١
	Neural networks, non-parametric windowing, and Bayes statistical theory are three popular methods for recognizing and classifying patterns. We introduce the fundamental concepts of these various approaches, including the classification phase and the learning phase. Part of the class will be devoted to methods for unsupervised learning and classification. We assume just some knowledge of elementary statistics, calculus, and elementary linear algebra at the upper division undergraduate level.
IT444	**Virtual Reality-1**
	الواقع الافتراضي-١
	This course introduces the basic principles of Virtual Reality and its applications. The necessary hardware and software components of interactive 3D systems as well as human factors are discussed. The material is reinforced by practical assignments and projects. The topics will be approximately as follows: 3D interfaces and interaction; visual, haptic, tactile, and auditory displays; position tracking; Collision detection and response; 3D displays, HMDs, tiled displays, stereo displays; collaborative, networked virtual environments; applications relating to virtual environments; augmented reality systems.

IT451	**Advanced Web Development** التطوير المتقدم للويب This course is covers the end-to-end development of web-based software for intranets and internets. This course emphasizes server-side development of enterprise applications. Topics include web servers, distributed network-based computing, handling client requests, server-side services, transmitting data using HTTP, database connectivity, security. This course is covers the end-to-end development of web-based software for intranets and internets. This course emphasizes server-side development of enterprise applications. Topics include web servers, distributed network-based computing, handling client requests, server-side services, transmitting data using HTTP, database connectivity, security, and e-commerce.
IT463	**Multimedia Communication** اتصالات الوسائط المتعددة This course introduces technologies for multimedia processing, coding, and communications. We will address how to efficiently represent multimedia data and how to deliver them over a variety of networks. In the coding aspect, state-of-the-art compression technologies will be presented. Emphasis will be given to state-of-the-art multimedia coding standards. Besides, considerations for constructing a video codec system will also be discussed. In the aspect of multimedia networking, special considerations for sending multimedia over the Internet and wireless networks, such as video adaptation, error resilience, error concealment, and quality of service will be discussed.
IT472	**Speech Recognition-1** التعرف على الكلام-١ This course aims to provide theoretical foundations and practical experience in computer speech processing and recognition. On completion of the course, students should be able to understand: what is automatic speech recognition (ASR), speech applications, major components in a speech recognition system, parameters that characterize the capabilities of ASR systems, speech signal in time domain, speech signal in frequency domain, speech modalities, features for speaker recognition, speaker identification and verification, evaluating speaker verification systems, how sounds of speech are generated, the source-filter model, resonance, formant, representations of speech, how to read the speech signal, how to distinguish between voiced and unvoiced speech, model for speech production, excitation process model, vocal tract model, lip radiation model, discrete time model for voiced speech production, overall transfer function, short time energy, short time zero cross count, pitch period estimation by using autocorrelation function and average magnitude difference function, Linear Predictive Coding (LPC), Mel Frequency Cepstrum Coefficients (MFCC).
IT486	**Project** المشروع This component is final year B.Sc project, which is essentially an exercise in systematic independent study and work, which must be executed and reported on to a satisfactory standard. The project provides students with the experience of planning and bringing to fruition a major piece of individual or group work. The module aims to encourage and reward creativity, initiative, intellectual discipline, clarity of communicating ideas and application of effort. Group projects also give the students a valuable experience of co-coordinating work with and organizing a group that aims at a technical product. A wide range of tasks can be undertaken, but almost always leading to the implementation of an information system,

	software or other information technology artifact. In some cases, students will do not have the time to produce an industrial-strength application; in these cases, a prototype that is systematically and fully evaluated and documented will be required.
IT487	**Information Technology Applications**
	تطبيقات تكنولوجيا المعلومات
	Course includes an introduction to the use of information and communication technologies (ICTs) in the context of library, corporate, government and other institutions. It includes the use of ICTs in large organizations, especially corporate organizations with an emphasis on database and enterprise systems, and understanding their changing application to public organizations (public libraries, archives, etc.). It is intended for students without formal background in information technology or information systems, and aims to provide a conceptual foundation for professional practice in information technologies, services and management. Students are also expected to learn how to use a discussion forum, a blog and RSS feeds.
IT488	**Web Intelligence and Security**
	ذكاء وامن الويب
	As the Web has become more and more important for businesses, the need has emerged for sound measurement of the effectiveness of the analytical tools to support continuous improvement of the customer experience. Online businesses gather an unprecedented amount of raw data about potential customers, but companies seek even more actionable insights (for example, by integrating their Web analytics data with data from offline sources, and applying advanced data mining techniques and predictive analytics to maintain deeper client relationships and enable one-to-one marketing). This is the concern of the first part of the course. Course also concerns the security of web. New and intelligent methodologies are emerged. As attackers is continuously learning to use the Internet as an accessible and cost-effective information infrastructure. Secure and non-secure web sites, online forums, and file-sharing services are routinely used by attackers, thieves and terrorist groups for spreading their propaganda, recruiting new members, and communicating with their supporters, along with sharing knowledge on forgery, explosive preparation, and other activities. The current number of sites and forums is so large and their URL addresses are so volatile that a constant manual monitoring of their multilingual content is definitely out of the question. Moreover, thieves and terrorist web sites often try to conceal their real identity, e.g., by masquerading themselves as news portals or religious forums. This is why automated Web Intelligence and Web Mining methods are so important for efficiently securing the Web against its misuse by terrorists and other dangerous criminals.
IT486	**Digital Signal Systems**
	Signals and systems models and classification. Continuous time signals. Signals and vectors. Generalized Fourier series representation.. Amplitude and phase spectra of signals. Energy and power content of signals. Bandwidth of signals. The Fourier Transform and applications. Sampling of signals. Convolution of signals. Power and Energy spectral densities. Correlation functions. Time-domain analysis of continuous time systems. The system impulse response. Communication channels. Filters: LPF, HPF and BPF. Discrete time signals. The discrete Fourier transforms (DFT) and the Fast Fourier Transform (FFT). Spectral analysis of DTS

	systems. Unit sample response and response to arbitrary input sequences. Introduction to the Z-transform. Computer project.
ITx8x	**Selected Topics in Information Technology**
	موضوعات مختارة فى نظم 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.

رابعاً: توصيف مقررات قسم نظم المعلومات

IS111	**Introduction to Information Systems**
	مقدمة نظم معلومات
	The aim of the course is to enable the students tolearn the basic functions of management (planning, organizing, leading/activating, and controlling), their component activities, and their interrelationships. The student should also understand and critically evaluate the alternative schools of thought, or philosophies about the field of management. (S)he will also gain knowledge and understanding of major theories and concepts in the field of Management, and gain knowledge of some of the contemporary developments in the field. The students will be acquainted with the management process; this includes understanding the theory behind and the practical applications of management.
IS212	**Systems Analysis & Design –1**
	تحليل وتصميم نظم-١
	The main objective of this course is to provide students with knowing the concept of systems analysis and design and its meaning in practice. Additionally, students will use a variety of information systems analysis and problem-solving tools and approaches. It describes the basic techniques of project estimating, writing detail specifications. The major topics of this course include: Introduction of Information system components, Types on information systems, System development life cycles, The systems analyst and Systems planning and Determining requirements like Interviews, JAD and RAD, Object-oriented systems development and Analyzing requirements and Evaluating alternatives, and Systems design and Systems implementation.
IS221	**Database Systems –1**
	نظم قواعد البيانات – ١
	This main objective of this course is to provide students with the concepts of relational database systems. Major topics of this course include: Evolution of database management systems, Relational data model, Relational database design, Structured Query Language (SQL), Entity-Relationship (E-R) modeling and design, Functional dependencies and normalization, Physical data Storage and File Organization.
IS251	**Web Design and Development**
	تصميم وتطوير الويب
	The course is designed to provide students with the programming and technical skills to design and develop effective Web applications. In web design track. Students will learn and gain the skills to create and design powerful interactive web sites, including graphic design,

	multimedia, video, animation, and e-commerce applications. In Web Development Track, Students will learn to build and develop functional aspects of websites including database integration, programming, and other server-side components using the latest programming, networking and human-computer interaction methods.
IS313	**Systems Analysis & Design –2**
	تحليل وتصميم نظم-٢
	The main objective of this course is to provide students with understanding of formal object-oriented analysis and design processes. The major topics include: Introducing Modeling and the Software Development Process, Creating Use Case Diagrams, Creating Use Case Scenarios and Forms, Creating Activity Diagrams, Determining the Key Abstractions, Transitioning from Analysis to Design using Interaction Diagrams, Modeling Object State Using State Machine Diagrams, Applying Design Patterns to the Design Model, Introducing Architectural Concepts and Diagrams, Introducing the Architectural Tiers, Refining the Class Design Model, Overview of Software Development Processes, Overview of Frameworks.
IS322	**Database Systems –2**
	نظم قواعد البيانات – ٢
	The main objective of this course is to provide students with an in-depth understanding of the design, management and implementation of database systems. Additionally, it provides the administration features of any RDBMS. Major topics of this course include: Review of Relational Algebra, Database Architectures, Indexing and Hashing, Query Processing and Optimization, Physical Database Design, Database Tuning, Transaction Processing, Concurrency Control, Database Recovery, Database Security and Authorization.
IS323	**Database Application Programming**
	برمجة تطبيقات قواعد البيانات
	The main objective of this course is to provide students with understanding of web-enabled database development. Moreover, it provides students with a foundation of knowledge needed to work with DBMSs and to create applications utilizing current development strategies. This course also offers instruction on developing databases using Oracle or SQL servers. Students examine various types of database techniques with emphasis on relational designs. Students design and implement solutions to business-related problems. Students will learn how to develop web applications that interact with databases, design applications with object-oriented design, perform tests on databases for quality assurance, code and implement programs using JAVA, and design data warehouses for information storage.
IS331	**Business Intelligence**
	ذكاء الأعمال
	The main objective of this course is to provide students with basic principles of Data Warehousing and usage of Business Intelligence (BI) for decision-making. Major topics of the course include: Online transaction processing (OLTP), Online analytical processing (OLAP), Extraction-Transformation-Loading (ETL), Dimensional modeling, Change Data Capture, Data security and privacy, Data warehouses and data markets, SQL OLAP, Business performance management, Data visualization and Analytics, Report design and development, Emerging trends in BI.
IS341	**Information Systems Applications**
	تطبيقات نظم المعلومات

	This course highlights several information systems applications, including Content Management System (CMS), Enterprise Resource Planning (ERP), Document Management Systems (DMS), Customer relationship management (CRM) systems, Supply Chain Management (SCM) systems, Electronic Medical Record, and Financial Management System (FMS).
IS342	**IS Strategy, Management & Acquisition**
	إستراتيجيات وإدارة وإكتساب نظم المعلومات
	The main objective of this course is to provide students with the issues and approaches in managing the information systems function in organizations and how the IS function integrates / supports / enables various types of organizational capabilities. Major topics of the course include: The IS function, IS strategic alignment, Strategic use of information, Impact of IS on organizational structure and processes, IS economics, IS planning, Role of IS in defining and shaping competition, Managing the information systems function, IS leadership, Structuring the IS organization, Hiring, retaining, and managing IS professionals, Managing a mixed set of internal and external resources, Determining staffing skills allocation models, Financing and evaluating the performance of information technology investments and operations, Acquiring information technology resources and capabilities, Using IS/IT governance frameworks, IS risk management.
IS352	**Information Storage and Retrieval**
	تخزين وإسترجاع المعلومات
	This course will provide basic and advanced techniques for text-based information systems. Key topics covered will include: efficient text indexing construction and compression; Boolean and vector space retrieval models; evaluation and interface issues; Web search including crawling, link-based algorithms, and Web metadata; text/Web clustering, classification; and text mining.
IS353	**Web Information Systems**
	نظم معلومات الويب
	This course will examine technologies for building data-centric information systems on the World Wide Web, discuss the social and policy context from which they arose, show the practical applications of such systems, and go into cross-cutting issues in this context. Key topics covered will include: Course Intro, Information in the Pre-Web Era, Technical Foundations of the Internet and the Web, Structuring Data, Exchanging Data with Web Services, From Web Services to a Global Data Space, Mid-term Review, Semantic Web Technologies - RDF/S and OWL, Semantic Web Technologies - SKOS, SPARQL, Ontology Engineering / Publishing Structured Data on the Web, Scholarly Information, Web Data Analysis and Semantic Science, Document Management Systems (DMS), and Human Computation.
IS361	**Intelligent Information Systems**
	نظم المعلومات الذكية
	This course aims to introduce the principles, concepts, theories and technologies that are developed in the fields of artificial and computational intelligence. How they can be used in the construction of information systems to support management decision making will be taught. By providing specific examples, the subject also aims to enable students to master the techniques for problem solving in various application areas in business and finance,

	computing and engineering. Topics will include: Introduction, Data, Information and Knowledge, Expert Systems for Managers, Case Based Reasoning, Data and Text Mining, Intelligent Decision Support Systems for Business Intelligence, Fuzzy Information Systems, Genetic algorithms for management applications, Neural Computation for business and finance, and new topics in AI.
IS371	**Digital Libraries**
	المكتبات الرقمية
	This course examines both theoretical and practical aspects of analysis, representation and retrieval of multimedia information in digital libraries, focusing largely on technological and socioeconomic issues. During this course students will be gain a broad understanding of digital libraries, including basic concepts, types and formats of digital content, the creation and organization of digital libraries, underlying technologies, the preservation of digital content, access management of digital library resources, and social and economic factors. At the end of this course, the students should have the expertise and competence to plan and create fully operational models for real-life multimedia digital libraries.
IS372	**E-Business**
	الأعمال الإلكترونية
	The main objective of this course is to provide students with the internet business protocols. Students should be familiar with e-Business models: B2C, B2B and C2C. This course also aims to provide an understanding of e-business and its associated technologies. The basics of online commerce will be introduced along with the elements that are particular to an electronic marketplace. Learning activities concentrate on the used tools such as JavaScript & PHP, CSS Styles & Layout. Topics includes e-Business Models, Internet Security, e-Business Infrastructure, Building Commercial Websites, Website Interface Design, e-Payment Systems, Website Administration & e-Marketing, e-Business trends, Web 2.0, and Mobile Commerce.
IS424	**Advanced Database Systems**
	قواعد البيانات المتقدمة
	The main objective of this course is to provide students with understanding of the modern data models of database systems (i.e., non-relational). Major topics of this course include: Object Oriented Databases, Multi-dimensional database modeling, Semi-structured database models, Web and Semi-structured data management, XML query engines, unstructured and multimedia databases, Active databases, Spatial, Temporal and Mobile databases, Main-memory databases, Real-Time databases.
IS432	**Distributed Data Management**
	إدارة البيانات الموزعة
	The main objective of this course is to provide students with the fundamentals issues in large distributed databases. Major topics of the course include: DDBMS Architecture, Distributed Database Design, Fragmentation and Allocation of relations, Integrating data from distributed sources, Schema matching and mapping, Cleaning integrated data, Propagation analysis of data quality rules via views, Data Replication, Semantic Integrity Control, Distributed Query Processing and Optimization, Distributed transactions, Concurrency control in distributed databases, Recovery in distributed databases, Availability and Reliability, Parallel and Multi-database Systems, Peer-to-Peer Data Management, NoSQL and data management on the cloud, and Recent trends in distributed databases.

IS433	**Cloud Computing** حوسبة سحابية This course provides a hands-on comprehensive study of cloud concepts and capabilities across the various cloud service models including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), and Business Process as a Service (BPaaS). To build comprehensive end-to-end business solutions on the Cloud. In addition, distributed data crunching with MapReduce, cloud and datacenter file systems, virtualization, security & privacy, and interactive web-based applications are included as key topics of this course.
IS434	**Business Process Management** إدارة العمليات التجارية The main objective of this course is to provide students with key concepts and approaches to business process designing, modeling, management and improvement. Major topics of this course include: Challenges in managing business processes, Approaches to business process management & improvement, Understanding organizational processes, Business process definition and classification, Identifying core processes, Modeling processes, Documenting processes, Process assessment, Measuring performance, Benchmarking, Statistical techniques for process measurement, Process improvement, Process design guidelines and principles, Continuous process improvement, Change management, Using IT for process management and improvement, Business process improvement and modeling software, Tools of business process simulation, ERP systems, Use cases, Organizational issues in business process management, Understanding the customer, Business process outsourcing, and Managing processes that cross organizational borders. Finally, the way in which information technology can be used to manage, transform, and improve business processes is also discussed.
IS435	**Data Management in the Cloud Computing** إدارة البيانات فى الحوسبة السحابية This course will look at the principles behind data management in the cloud as well as discuss actual cloud data management systems that are currently in use or being developed. The topics covered in the course range from novel data processing paradigms (MapReduce, Scope, DryadLINQ), to commercial cloud data management platforms and open-source NoSQL databases. This course will also report on efforts to classify, compare and benchmark the various approaches and systems. Students in this course will gain broad knowledge about the current state of the art in cloud data management and, through a course project, practical experience with a specific system. Furthermore, The various challenges and issues in adapting and accepting Big data technology, its tools (e.g., Hadoop), its applications, and its benefits are also discussed in this course.
IS438	**Big Data Statistical Analysis** التحليل الاحصائى للبيانات الكبيرة This course covers foundational techniques and tools required for data science and big data analytics. The course focuses on concepts, principles, and techniques applicable to any technology environment and industry and establishes a baseline that can be enhanced by further formal training and additional real-world experience.
IS443	**Enterprise Architecture** بنية الشركات

	The main objective of this course is to provide students with the design, selection, implementation and management of enterprise IT solutions. Major topics of this course includes: Service oriented architecture, Enterprise architecture frameworks, Systems integration, Enterprise resource software, Monitoring and metrics for infrastructure and business processes, Green computing, Virtualization of storage and systems, The role of open source software, Risk management, Business continuity, Total cost of ownership and return on investment, Software as a service, Enterprise data models, Data / information architecture and data integration, Content management, Audit and compliance, System administration, IT control and management frameworks, Emerging technologies.
IS444	**Knowledge Management**
	إدارة المعرفة
	This course introduces concepts and methodologies in data and knowledge management. It provides students with a broad understanding of the strategies and processes for capturing, structuring, sharing organizational intellectual assets that enhance the performance and competitiveness of a business. Special attention will be given to computational methodologies and tools (database systems, knowledge representation and reasoning, participatory knowledge construction, semantic search) that enable and support the practice of data and knowledge management in making better strategic decisions.
IS462	**Data Mining**
	تنقيب البيانات
	The main objective of this course is to provide students with theoretical aspects of data mining techniques including characterization, discrimination, classification, association, predication, and cluster analysis. Also aspects of data preprocessing technique, Mining complex types of data, spatial DBs, text DBs, time-series DBs and temporal DBs, multimedia DBs and Mining the WWW. Related fields from which data mining draws, like database technology, artificial intelligence, and machine learning, will be emphasized. Data mining applications will also be introduced based on the interest of the students.
IS463	**Information Security**
	أمن المعلومات
	The main objective of this course is to provide students with the issues related to securing information systems and the development of policies to implement information security controls. Topics include view of networking and security, security issues, trenOR, security resources, and the role of policy, people, and processes in information security. This course include: information security risks and policy, identify processes to implement and enforce policy, Access Control Issues and Administration, and Communications Security.
IS464	**Geographic Information Systems**
	نظم المعلومات الجغرافية
	The objective of this course is to learn how to treat the geographical data, the connection between the geographical and the attributed data the differences types of data acquisitions techniques as photogrammetry, GPS, remote sensing etc. The topics of this course will cover details of spatial data concepts and its origin in different science branches, GIS data models, vector GIS and its characteristics, advantages and limitations of vector mapping systems, topological and non-topological models, vector GIS capabilities, TIN model, Raster GIS, raster data and its characteristics, advantages and disadvantages of raster mapping systems, raster functions grid model, Data Processing and Analysis, Data Presentation, Data

	Quality, DTM, Hardware and Software for GIS, and GIS tools.
IS465	**Social Informatics**
	معلوماتية المجتمعية
	In this course, we will look at some key approaches to the interaction between Information and Communication Technologies (ICT) and society. Our premise is that, to design and build effective information systems, we need to address both knowledge creation and use, and the relationship between technology and society, including the individual, disciplines, organizations, and groups and communities of various sorts. Topics will include: knowledge creation and knowledge communities; how information systems both support knowledge communities, such as workgroups and disciplines, and cross the boundaries between them; the social construction of technology; practice, the dynamic activity of knowledge creation and use; representation, a key issue in social studies of information technology (e.g. the use of texts and visualizations in scientific practice) and how it applies to information systems; social approaches to documents, and categorization and classification; social networks, Geospatial networks, and ethnographic research methods as applied to knowledge communities and information systems.
IS466	**Bioinformatics**
	المعلوماتية الحيوية
	Bioinformatics is the theory, application and development of computing tools to solve problems and create hypotheses in all areas of biological sciences. Biology in the post-genome world has been and continues to be transformed from a largely laboratory-based science to one that integrates experimental and information science. In this course, students learn fundamental concepts and methods in bioinformatics, a field at the intersection of biology and computing. It surveys a wide range of topics including computational sequence analysis, sequence homology searching and motif finding, gene finding and genome annotation, protein structure analysis and modeling, genomics and SNP analysis, DNA microarrays and gene expression analysis, Proteomics, network/systems biology, and biological knowledge discovery.
IS473	**IS Innovation and New Technologies**
	الإتجاهات والتكنولوجيا الجديدة لنظم المعلومات
	This course provides the knowledge and skills to leverage emerging and innovative information technology with general principles of Design Process to create business opportunities for both new entrepreneurial ventures and traditional firms. As we move into the digital world, the ways by which companies create value is fundamentally shifting from products to experiences. The rapid convergence to digital technology opens up new opportunities to offer novel products and services that did not exist before. In this course, students will be asked to think about how entrepreneurs and companies produce radically new and desirable products and services in an increasingly digital world. Through hands-on exercises and team-based projects, student will learn how to evaluate and apply new innovative technologies to create new digital experiences, products, and services.
IS482	**- Big Data –** البيانات الضخمة
	Parallel database management- Distributed databases and distributed query processing- Map Reduce and other parallel programming models- Big data: theory and practice- Volume: tractability revisited; parallel scalability; bounded availability, techniques for querying big

	data, by making big data small- Veracity: data quality, the other side of big data; central issues of data quality; dependencies for improving data quality; discovering data quality rules; cleaning distributed data; data repairing; entity resolution.
IS483	**Data Science**
	This course Covers the basic theory, algorithms, and applications of tensor decomposition in data science and machine learning. Matrix and tensor rank, multiline rank, low-rank (canonical polybasic) and Tucker decomposition, identifiability, algorithms, performance bounds, sparse computations, parallelization, and applications from topic and graph mining, to mixture modeling, recommender systems, and speech / audio / language modeling and understanding. *introduction to Python and R programming- Data science workflow- Numerical calculations- Scientific calculations-Plotting- Data manipulation-Data analysis- Machine learning*
IS482	**Project** المشروع This component is final year B.Sc project, which is essentially an exercise in systematic independent study and work, which must be executed and reported on to a satisfactory standard. The project provides students with the experience of planning and bringing to fruition a major piece of individual or group work. The module aims to encourage and reward creativity, initiative, intellectual discipline, clarity of communicating ideas and application of effort. Group projects also give the students a valuable experience of co-coordinating work with and organizing a group that aims at a technical product. A wide range of tasks can be undertaken, but almost always leading to the implementation of an information system, software or other information technology artifact. In some cases, students will do not have the time to produce an industrial-strength application; in these cases, a prototype that is systematically and fully evaluated and documented will be required.
ISx8x	**Selected Topics in Information systems** موضوعات مختارة في 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.

خامساً: توصيف مقررات قسمبحوث العمليات ونظم دعم القرار

OD111	**Discret Mathematics** تراكيب محددة This is an introductory course in discrete mathematics. The goal of this course is to introduce students to ideas and techniques from discrete mathematics that are widely used in computing sciences and engineering. The course gives the students the necessary techniques to think logically and apply these techniques in solving problems. The contents of this course should cover the following topics: Propositional Logic, Predicate Logic and Quantification, Boolean Algebra, Methods of Proof, Sets and Functions, Growth of Functions, Mathematical

	Induction, Recursion, Sequences and Summations, Program Correctness and Graphs and its Applications.
OD112	**Fundamentals of Management**
	مبادئ فى الادارة
	This course prepares students with a comprehensive introduction to effective management principles. The course aims to provide students with an introduction to contemporary management concepts and skills, it also encourages students to put these concepts and skills into practice. Through the course, students are expected to improve their skills to manage their study and personal lives. In addition, they will be equipped with management competence and understanding of managerial ethics for their future career. The contents of this course include history of Management, fundamentals of planning, decision making, strategic planning, planning tools, organizing and managing human resources. Influencing; PERT and CPM, controlling, production management and control, quality management, management of service industries. The principles of problem identification and definition, model formulation, solution approaches, analysis and implementation. Data envelopment analyses. Analytical Hierarchy process.
OD213	**Introduction toOperations research and Decision support**
	مقدمة في بحوث العمليات ودعم القرار
	The course will introduce the well-known OR areas such as linear programming, integer programming, goal programming, transportation, and models for optimization, non-linear programming are presented. The solution approaches of these models with the help of relevant software packages will be covered. The course includes the ability to interpret the results of the above models and an understanding of their advantages and limitations. The DSS part of the course contains an introduction to concepts and methods of DSS and the Components of a computer-based DSS.
OD251	**Decision Support Systems and Applications**
	نظم دعم القرار وتطبيقاتها
	Problem solving, decision-making process, model building, types of computer based information systems. Systems analysis and design methodologies and computer based decision support systems are presented. Classification of models included in Decision Support Systems (DSS),Group decision support systems GDSS. Principal components of an integrated DSS. Data management versus Model Management Systems. Model selection, integration, execution and interpretation functions. Concepts of a model building language. Illustrative examples of integrated DSS case studies. Approaches and techniques to construct and implement an effective computer-based Decision Support Systems (DSS). 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 (MIS, AI, and ES) 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.
OD314	**Statistical Analysis in Decision Support**
	التحليل الإحصائى فى دعم القرار
	Application of statistical techniques and methods to support decision-making will be considered. Introducing sampling techniques, data presentation and analysis. Multiple comparisons and multiple ranking. Tests of goodness of fitness, experimental analysis and

	analysis of variance. Simple and multiple regressions. Time series analysis, including time series decomposition and exponential smoothing. Advanced forecasting models. The use of statistical software to implement and test the statistical techniques and methods is stressed throughout the course.
OD321	**Project Management** إدارة المشروعات 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 subjects such as: e-projects, and Intelligent project management. Introduction to Project Management Body of Knowledge (PMBOK) and project management systems. Pricing and estimating. Project risk management. Managing multiple projects and enterprise project management. Effects of concurrent engineering. Critical chain project management. Dependency structure matrix. Object oriented project management.
OD331	**Linear and integer programming** البرمجة الخطية والصحيحة This course includes the graphical solution approach, the simplex method with the sensitivity analysis, duality in linear programming and the economic interpretation, revised simplex, dual simplex, decomposition,. Combinatorial optimization problems. Assignment Models. Linear Goal programming. interior-point method. Parametric Linear programming. Cutting plane, Branch and bounding, branch and cut Methods, Enumeration techniques. Formulations and some real life applications as well as linear programming and integer programming software.
OD332	**NonLinear and Dynamic programming** البرمجة غيرالخطية والديناميكية Convex and concave functions, Algorithms for unconstrained optimization, including gradient Ascent/descent methods, conjugate directions, and Newton-type and quasi-Newton methods, golden section method, uniform search, bisection method. Algorithms for constrained optimization, including active set methods and penalty and barrier methods, lagrangain method, Kuhn-tucker conditions and Characteristics of Dynamic Programming DP, deterministic and non-deterministic (DP). Concepts of multistage decision-making, recursive equations, forward and backward recursion, and state variables in DP. Dynamic Programming for different problem types. Use of modeling languages and standard OR packages are recommended.
OD341	**Stochastic Models** النماذج العشوائية 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 , martingales process, Poisson process , truncated, pure birth process , pure death process , birth and death process, and their applications in OR&DS Models . An introduction to queuing systems, single and multi-stage queuing models (M/M/1, M/M/C, … , etc.), Queuing network models . Formulation and solution approaches of OR models involving random variables or events. Standard software packages are used as training tools in

	this course.
OD342	**Modeling and Simulation**
	النمذجة و المحاكاة
	Fundamentals of computer simulation as a modeling technique are presented. Simulation will be versus mathematical modeling. The value of simulation as an experimental tool to support solving the problem and decision making process. Time management in simulation models (concepts of timing routine). Stochastic versus deterministic models. Discrete versus continuous simulation. Deterministic fixed time advance simulation. Stochastic discrete event simulation (event, activity and process-based models). Random sampling on computers. An overview of statistical methods in simulation experiments. Introduction to software tools for simulation purposes. The development of simulation models using procedural and simulation programming languages is stressed throughout the course.
OD343	**Advanced Modeling & simulation**
	النمذجة والمحاكاة المتقدمة
	The aim of this course is to provide students with the ability to model, simulate and analyze complex systems in a reasonable time. This course covers advanced techniques in simulation model design, model execution, model analysis, and Verification and Validation Techniques. A selection of model design techniques such as conceptual models, declarative models, functional models, constraint models, and multi-models will be discussed. Model execution techniques include discussion of serial and parallel discrete-event simulation algorithms. For model analysis, topics include input-output analysis, variance reduction techniques and experimental design and optimization. Case studies.
OD344	**Queuing systems**
	نظم صفوف الانتظار
	This course introduces the fundamental concepts of queuing theory, the performance measures of queuing, queuing software. It also discusses the Infinite-Source Queuing Systems such as The M/M/1 Queue, The M/M/1 Queue with Balking Customers, Priority M/M/1 Queues, The M/M/1/K Queue systems with Finite Capacity, M/M/∞ Queue, The M/M/n/n Queue, Erlang-Loss System,The M/M/n Queue,The M/M/c/K Queue - Multiserver, Finite-Capacity Systems, The M/G/1 Queue. TheFinite-Source Systems are also discussed such as :The M/M/r/r/n Queue, Engset-Loss System,The M/M/1/n/n Queue, Heterogeneous Queues, The M/M/r/n/n Queue, The M/M/r/K/n Queue, The M/G/1/n/n/PS Queue and The G/M/r/n/n/FIFZO Queue.
OD345	**Simulation Models in Management and Economics**
	نماذج المحاكاة في الإدارة والاقتصاد
	The use of simulation models and techniques to solve problems in business, economics, and industry. Model building, Difficulties in Building Simulations, Difficulties in Extending Simulation Models. Use of simulation in Management Planning: Corporate models, long- and short-range planning and decision making. Simulation models of the corporation or of individual facilities, insights for developing future strategies. Finding the most profitable type, number, and location of manufacturing and distribution facilities. Marketing and product mix decisions. Use of simulation models in economics and Financial Market. Macroeconomic and Microeconomics models like: Economic evaluation of projects, including cost specification

	and analysis,cash flows, and time value of money, budgeting analysis, interest andequivalence. Economic analysis of alternatives. The evolution of economic variables over time. Determine locations for production, assembly plants, warehouses, and government agencies: offices, schools, hospitals, fire stations, ambulance bases.
OD346	**Quantitative Models for Services**
	النماذج الكمية للخدمات
	The use of simulation and optimization models for public services will be the main purpose of the course. Analysis, modeling and finding efficient policies and decisions to improve system performance will be the outcome of investigating such systems. Various case studies of public services will be discussed, which include traffic control, water services, solid waste, urban planning, pollution control, etc… A holistic system approach will be used to investigate the various systems, illustrating the goals and actions of the agents in the system, the various sources of policy resistance, the main interactions between the various components in the system, and the major bottlenecks in the system.
OD352	**Logistics Management**
	إدارة اللوجيستيات
	Logistics Management is the part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements. This course introduces logistics and issues involved in planning, implementing and controlling logistic networks. It provides an overview and analysis of the elements of logistics functions in widely varying types of industries and agencies. Topics covered include: distribution network configuration, vehicle fleet managements, vehicle routing models, inventory models, facility location models, packing problems, and integrated logistics models.
OD371	**Computer Languages for Modeling and Operation Research**
	لغات الحاسب للنمذجة وبحوث العمليات
	Operations Research and Decision Support software theory and applications are introduced.The use of professional software packages and languages in Operations Research and Mathematical Programming computer-based Modeling language are stressed through the course. One of these packages will be studied in more details including its data management, model specification, model verification, alternative solvers, and output display. The course also stresses the computational aspects of simulation models using both procedural languages and general-purpose simulation languages. Issues related to data structures and statistical analyses of simulation output are also considered. Alternative computer simulation languages are briefly reviewed including: general-purpose simulation systems, network simulation languages and special application simulation languages. Relationship between simulation modeling approaches and computer-based languages are established. One of the general-purpose simulation languages is studied in a more detailed manner and used by students to construct a number of real world simulation applications.
OD433	**Multiobjective programming**
	البرمجة متعددة الاهداف
	Concepts of both the linear and nonlinear multi-objective programming. Vector optimization problems techniques. Utility theory. Different Scalarization techniques (weighting approach…). Value theory. Goal programming methods. Interactive multi-

	objective programming methods. Parametric approaches for multi-objective programming. The use of metaheuristic based techniques in handling multi-objective problems will be discussed. Applications and usage of software packages are stressed throughout the course.
OD434	**Network optimization**
	امثلية الشبكات
	Introduction to network problems in operations research, computer science, electrical engineering and systems engineering. Concepts of graph theory. Network representations. Network transformations. Shortest paths algorithms. Maximum flows algorithms. Minimum cost flows algorithms. Generalized network and combinatorial-based network models. The use of commercial software packages are recommended for this course.
OD453	**Decision and Game Theory**
	نظرية القرارات والمباريات
	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 case studies will be used to illustrate the application of decision theory to real world problems besides using commercial software packages.
OD454	**Strategic and Crisis Management**
	الإدارة الاستراتيجية وإدارة الأزمات
	Draws from all functional areas of an enterprise to provide strategic directions to an organization. Strategies are offered to ensure success in a competitive "for profit" environment. A framework is developed to understand the interrelation of accounting, finance, operations, engineering, and marketing. Concepts and fundamentals of crisis management, resolving crisis, and types of crisis are introduced. Applications and use of software packages are stressed throughout the course.
OD455	**inventory control and production management**
	مراقبة المخزون وادارة الانتاج
	This course covers the fundamental principles of inventory control. Inventory management measurements and techniques will be explained. The financial importance of inventory management and control and its relationship to company financial statements will be reviewed. The contents of this course include an Introduction to inventory control problems. Inventory performance measurements. Inventory turnover. Deterministic economic order quantity inventory model. The Basic Economic Order Quantity Model. The EOQ Model with shortage. Probabilistic Inventory Models. The Concept of Marginal Analysis, The news vendor problem; continuous and discrete demand, continuous review models, periodic review model. The economic order quantity with Uncertain Demand. Solution approaches, including the use of the available operations management software packages.
OD456	**Geographic Information Systems for Decision Support**
	نظم المعلومات الجغرافية لدعم القرار
	Geographical Information System (GIS) concepts and applications are discussed in this course. The utilization of computer-based GIS as a tool for supporting decision making. Tools of

	GIS such as: computer graphics, input and output devices, display facilities, modeling and animation. Relation between Multi-objective programming and the GIS concepts. The course contains written assignments, programming projects and the use of advanced commercial GIS software packages.
OD457	**Data Management in Decision Support** إدارة البيانات فى دعم القرار This course includes essential concepts, principles and methods in Decision Support Systems provided by the advancements in data management systems. This covers aspects of data-centered Decision Support Systems including data modeling , data analysis, data warehousing design, warehouse building tools, data access and on-line analytical processing (OLAP) concepts and implementation. An introduction to data mining methodology , techniques ,tools , applications , technology integration architecture for data mining to support decision making process. An introduction to the commercial database systems such as IBM DB2 , ORACLE and INFORMIX , and their capabilities and tools for data warehouse building, and their business intelligence tools.
OD458	**Knowledge Base Decision Support systems** نظم دعم القرار المعرفية This course integrates expert-system technology with decision-support technology to introduce a new conceptual framework -knowledge-based decision support systems. It describes the methodology for creating such a system, discusses the process of cognitive modeling and problem solving, design of solution strategies, computer implementation and validation. Course contents: Cognitive Processes and Problem Solving, The Normative View of Decision Making, Decision Support Systems, Expert Systems, Knowledge-based Decision Support Systems, Knowledge Modeling, Building and Implementing Knowledge-based, Testing and Evaluation, Knowledge-based Decision Support Systems Applications in business, management, finance, engineering, etc. Use of some selected software package will be of significant help in meeting the course objectives. The development of a user-centered decision support system that includes visual modeling and decision support tools that integrate artificial intelligence techniques is recommended.
OD459	**Risk Management** إدارة المخاطر 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 dominance and multi-attribute methods; applications to project management, scheduling, and cost estimation.
OD461	**Computational Intelligence for Decision Support** الحسابات الذكية لدعم القرار This course will cover the four main components of the field of Computational Intelligence: namely Evolutionary, metaheuristic, Fuzzy, and Neural Computation. An emphasis will be made on the application of Computational Intelligence (CI) techniques to optimization, prediction and modeling. Related heuristic techniques such as swarm intelligence algorithms, Genetic Algorithms, Simulated Annealing and many same 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.
OD462	**Advanced Computational Intelligence**
	الحسابات الذكية المتقدمة
	This course will focus on the synthesis of CI techniques for building decision support systems. The use of synthetic systems that build on a synergetic combination of techniques will be detailed. Recent developments in the field of Computational Intelligent that are relevant of building ORS will also be explored. Topics covered may include: Neurofuzzy models, Neurogenetic models, mixture of experts ANN, support vector machines, kernel methods, and collective intelligence. The interpretation of model results and presentation of output will be expounded upon throughout the course.
OD472	**Stochastic Programming**
	البرمجة العشوائية
	The aim of stochastic programming is to find optimal decisions in problems which involve uncertain data. This course involved an Introduction to probability spaces, random variables, risk aversion, Classification of uncertainty, Robust optimization and Chance constraints. Probabilistic programming. Two stages linear programming. Stochastic Integer programming. Two stages nonlinear programs with recourse. Multi-stage Stochastic programs with recourse. Discrete bounding approximations. Monte-Carlo methods. L-shaped, and Quasi Gradient methods. Case study, the use of available modeling software is stressed throughout the course.
OD473	**Expert Systems Applications**
	تطبيقات النظم الخبيرة
	Basics about natural and artificial intelligence, Automatic proven of theorems , Fuzzy expert systems, Neuron networks and expert systems, Genetic algorithms, Agents, multi-agents and intelligent systems, Modern intelligent systems: Intelligent data base, Modern intelligent systems: Hybrid information systems, Modern intelligent systems: intelligent, telecommunication networks, Methodology of expert systems development, Tools for creating of expert systems, Creating of expert systems: Acquisition of knowledge in expert systems, Examples of fuzzy expert systems.
OD 455	التنبؤ وتحليل التوقعات Forecasting and predictive Analysis
	Fundamentals of predictive analytics as it relates to improving business performance. The course will cover predictive models, key modeling techniques, scoring, non-parametric regression and classification, principal components analysis and dimension reduction, time series, quality control methods, multiple predictor variables, and decision trees. The course will utilize best practices and case studies to illustrate how predictive analytics can facilitate educated decision-making to reduce costs, increase revenues, and provide competitive advantage across a variety of industries.
OD481	**نمذجة النظم الديناميكية** **System Dynamics Modeling**
	What is System Dynamics-Introduction to Stocks and Flows- Mapping the stock and flow structure of systems - Dynamics of stocks and flows- Linking feedback with stock and flow structure- First-order systems Stocks and Flows Tutorial Fundamental modes of dynamic behavior- Interactions of the fundamental modes- Interactions of Operations, Strategy, and Human Resource Policy- feedback structure of s-

	shaped growth. The diffusion and growth of new products, network externalities, and complementarities- Modeling s-shaped Growth Tutorial- Supply Chain oscillation Tutorial Manufacturing Supply Chain- Reengineering the supply chain-System Dynamics Implementation:
OD482	اتخاذ القرارات الاستراتجية **Strategic Decision Making**
	Decision Modeling and Analysis is an examination of the analytical tools used to make optimal business decisions. Topics include: decision analysis, linear programming, waiting line models and project scheduling. There is strong emphasis on understanding business problems and how model building will assist the decision maker in making better decisions. Students will practice building, using and modifying business analysis models. It is strongly recommended that College Math be taken prior to this course.
OD482	**Project** مشروع 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.
ODx8x	**Selected Topics in Decision Support** موضوعات مختارة فى دعم القرار This course focuses on the new trends and future prospects of Operations Research and Decision Support Systems. Large-scale, stochastic, fuzzy, and the use of intelligent tools are some examples of the proposed topics. Real and practical applications and case studies of Operations Research and Decision Support Systems in different fields are recommended, examples of these fields are: computer applications, risk analysis, banking, logistics, military, chemical, medical, oil industry, production, agriculture, airspace, education, naval transport, and others. Recent papers and publications in Operations Research and Decision Support Systems can be used to inform students about recent trends and to train them reading and understanding scientific writing.

مقترح الخطة الدراسية

المستوي الأول

المستوي الاول	الفصل الدراسى: الأول	التخصص : عام

الكود	اسم المقرر	Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات		
			محاضرة	تمارين/عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
GN170	صياغة التقارير العلمية والفنية	Scientific & Technical Report Writing	٣	-	٣	٢٠	٢٠	٢٠
MA111	رياضيات-١	Mathematics-1	٢	٢	٣	٢٠	٢٠	٢٠
OD111	تراكيب محددة	Discrete Mathematics	٢	٢	٣	٢٠	٢٠	٢٠
GNxx	اختياري - متطلبات عامة		٣	–	٣	٢٠	٢٠	٢٠
CS110	أشباه الموصلات	Semiconductors	٢	٢	٣	٢٠	٢٠	٢٠
CS111	مقدمة فى الحاسبات	Computer Introduction	٢	٢	٣	٢٠	٢٠	٢٠
	اساسيات الجودة	Fundamentals of quality	١	-	-	٥	-	١٥
	إجمالى عدد الساعات الأسبوعية :		١٥	٨	١٨			

الفصل الدراسى: الثانى	التخصص : عام

الكود	اسم المقرر	Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات		
			محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
IT181	تصميم منطقى-١	Logic Design-1	٢	٢	٣	٢٠	٢٠	٦٠
MA112	رياضيات-٢	Mathematics-2	٢	٢	٣	٢٠	٢٠	٦٠
GN112	مباديء ادارة	Fundamentals of Management	٣	–	٣	٢٠	٢٠	٦٠
PH111	مباديء برمجة	Fundamentals of Programming	٢	٢	٣	٢٠	٢٠	٦٠
IS111	مقدمة نظم معلومات	Introduction to IS	٢	٢	٣	٢٠	٢٠	٦٠
ST190	إحصاء واحتمالات	Statistics & Probabilities	٢	٢	٣	٢٠	٢٠	٦٠
HM110	حقوق إنسان	Human Rights	1	-	–	٥		١٥

إجمالى عدد الساعات الأسبوعية :	١٤	١٠	١٨

المستوي الثاني

الفصل الدراسى: الأول							التخصص : عام		
الكود	اسم المقرر	Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات		
			محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
IS251	تصميم وتطوير الويب	Web Design and Development	٢	٢	٣	٢٠	٢٠	٦٠
CS231	برمجة حاسبات – ١	Computer Programming – 1	٢	٢	٣	٢٠	٢٠	٦٠
CS211	تنظيم الحاسبات	Computer Architecture	٢	٢	٣	٢٠	٢٠	٦٠
CS212	هياكل البيانات	Data Structure	٢	٢	٣	٢٠	٢٠	٦٠
IT261	وسائط متعددة – ١	Multimedia-1	٢	٢	٣	٢٠	٢٠	٦٠
OD213	مقدمة فى بحوث العمليات ودعم القرار	Introduction to Operation Research & Decision Support	٢	٢	٣	٢٠	٢٠	٦٠
	إجمالى عدد الساعات الأسبوعية :		١٢	١٢	١٨			

الفصل الدراسى: الثانى							التخصص : عام	
الكود	سم المقرر	Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات		
			محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
CS261	نظم تشغيل-١	Operating Systems-1	٢	٢	٣	٢٠	٢٠	٦٠
CS233	برمجه حاسبات – ٢	Computer Programming-2	٢	٢	٣	٢٠	٢٠	٦٠
OD342	النمذجه والمحاكاه	Modeling & Simulation	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري-١	Selected-1	٢	٢	٣	٢٠	٢٠	٦٠
IT211	شبكات الحاسبات-١	Computer Networks-1	٢	٢	٣	٢٠	٢٠	٦٠
IS212	تحليل نظم-١	System Analysis-1	٢	٢	٣	٢٠	٢٠	٦٠
	إجمالى عدد الساعات الأسبوعية :		١٢	١٢	١٨			

المستوى الثالث : تخصص علوم الحاسب

الفصل الدراسى: الأول							التخصص : علوم الحاسب
الكود	سم المقرر	Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات	
			محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
CS251	هندسة البرمجيات-١	Software Engineering-1	٢	٢	٣	٢٠	٢٠	٦٠
IS221	نظم قواعد البيانات-١	Database Systems-1	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
CS334	برمجه حاسبات -٣	Computer Programming - 3	٢	٢	٣	٢٠	٢٠	٦٠
CS321	الذكاء الاصطناعي	Artificial Intelligence	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	إجمالى عدد الساعات الأسبوعية :		١٢	١٢	١٨			

الفصل الدراسى: الثانى							التخصص : علوم الحاسب
الكود	اسم المقرر	Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات	
			محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
CS352	هندسة البرمجيات-٢	Software Engineering-2	٢	٢	٣	٢٠	٢٠	٦٠
CS362	نظم تشغيل-٢	Operating Systems-2	٢	٢	٣	٢٠	٢٠	٦٠
CS323	تعلم الآلة	Machine learning	٢	٢	٣	٢٠	٢٠	٦٠
CS424	نظم قواعد المعرفة	Knowledge Based Systems	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	إجمالى عدد الساعات الأسبوعية :		١٢	١٢	١٨			

المستوي الرابع : تخصص علوم الحاسب

الفصل الدراسى: الأول		التخصص : علوم الحاسب						
الكود	اسم المقرر Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات			
		محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
CS471	بناء المترجمات Compiler Design	٢	٢	٣	٢٠	٢٠	٦٠
CS443	البرمجة المتوازية Parallel Programming	٢	٢	٣	٢٠	٢٠	٦٠
CS415	أمن الحاسب Computer Security	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	مشروع Project	١,٥	٣	٣	-	-	-
	إجمالى عدد الساعات الأسبوعية :	١١,٥	١٣	١٨			

الفصل الدراسى: الثانى		التخصص : علوم الحاسب						
الكود	اسم المقرر Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات			
		محاضرة	تمارين عملى /	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
CS472	معالجة اللغات الطبيعية Natural Language Processing	٢	٢	٣	٢٠	٢٠	٦٠
CS442	النظم الموزعة Distributed Systems	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	مشروع Project	١,٥	٣	٣	٢٠	٢٠	٦٠
	إجمالى عدد الساعات الأسبوعية :	١١,٥	١٣	١٨			

المستوي الثالث: تخصص نظم المعلومات

الفصل الدراسى: الأول التخصص : نظم المعلومات								
الكود	اسم المقرر Course Name		عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات		
			محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
CS251	هندسة البرمجيات-١	Software Engineering-1	٢	٢	٣	٢٠	٢٠	٦٠
IS221	نظم قواعد البيانات-١	Database Systems-1	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
IS322	نظم قواعد البيانات-2	Database Systems-2	٢	٢	٣	٢٠	٢٠	٦٠
IS312	تحليل وتصميم نظم -2	Systems Analysis and Design -2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	إجمالى عدد الساعات الأسبوعية :		١٢	١٢	١٨			

الفصل الدراسى: الثانى التخصص : نظم المعلومات								
الكود	اسم المقرر Course Name		عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات		
			محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
IS331	ذكاء الأعمال	Business Intelligence	٢	٢	٣	٢٠	٢٠	٦٠
IS355	إسترجاع المعلومات	Information Retrieval	٢	٢	٣	٢	٢٠	٦٠
IS426	نظم قواعد بيانات حديثة	Modern Database Systems	٢	٢	٣	٢٠	٢٠	٦٠
IS465	تنقيب البيانات	Data Mining	٢	٢	٣	٣	-	٧٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٣	-	٧٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٣	-	٧٠
	إجمالى عدد الساعات الأسبوعية :		١٢	١٢	١٨			

المستوي الرابع : تخصص نظم المعلومات

الفصل الدراسى: الأول			التخصص : نظم المعلومات					
الكود	اسم المقرر	Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات		
			محاضرة	تمارين/ عملى	مجموع	أعمال فصل	عملى وشفهى	تحريرى
IS426	نظم قواعد بيانات حديثة	Modern Database Systems	٢	٢	٣	٢٠	٢٠	٦٠
IS463	أمان المعلومات	Information Security	٢	٢	٣	٢٠	٢٠	٦٠
IS435	حوسبة سحابية	Cloud computing	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	مشروع	Project	١,٥	٣	٣	-	-	-
			١١,٥	٣	٣			

الفصل الدراسى: الثانى			التخصص : نظم المعلومات					
الكود	اسم المقرر	Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات		
			محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
IS433	إدارة البيانات الموزعة	Distributed Data Management	٢	٢	٣	٢٠	٢٠	٦٠
IS462	نظم المعلومات الجغرافية	Geographic IS	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٣٠	-	٧٠
	مشروع	Project	١,٥	٣	٣	٤٠	٦٠	-
	إجمالى عدد الساعات الأسبوعية :		١١,٥	١٣	١٨			

المستوي الثالث: تخصص تكنولوجيا المعلومات

الفصل الدراسى: الأول

الكود	اسم المقرر Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات			
		محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
CS251	هندسة البرمجيات-١ Software Engineering-1	٢	٢	٣	٢٠	٢٠	٦٠
IS221	نظم قواعد البيانات-١ Database Systems-1	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
IT371	معالجة الاشارات الرقمية digital signal proc.	٢	٢	٣	٢٠	٢٠	٦٠
IT312	شبكات الحاسب ٢	٢	٢	٣	٢٠	٢٠	٦٠
CS321	الذكاء الاصطناعي	٢	٢	٣	٢٠	٢٠	٦٠
	إجمالى عدد الساعات الأسبوعية :	١٢	١٢	١٥			

الفصل الدراسى: الثانى التخصص : تكنولوجيا المعلومات

الكود	اسم المقرر Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات		
		محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
IT321	معالجة الصور	٢	٢	٣	٢٠	٢٠	٦٠
IT341	الرسم بالحاسب -١	٢	٢	٣	٢٠	٢٠	٦٠
IT472	التعرف على الكلام -١	٢	٢	٣	٢٠	٢٠	٦٠
IT313	شبكات الحاسب -٣	٢	٢	٣	٢٠	٢٠	٦٠
IT417	برمجة شبكات الحاسب	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	إجمالى عدد الساعات الأسبوعية :	١٢	١٢	١٨			

المستوي الرابع : تخصص تكنولوجيا المعلومات

الفصل الدراسى: الأول		التخصص : تكنولوجيا المعلومات						
الكود	اسم المقرر Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات			
		محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
IT444	الواقع الافتراضي	٢	٢	٣	٢٠	٢٠	٦٠
IT431	التعرف علي الانماط	٢	٢	٣	٢٠	٢٠	٦٠
IT418	تأمين الشبكات	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
IT486	المشروع	١,٥	٣	٣	-	-	-
	إجمالى عدد الساعات الأسبوعية :	١١,٥	١٣	١٨			

الفصل الدراسى: الثانى		التخصص : تكنولوجيا المعلومات						
الكود	اسم المقرر Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات			
		محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
IT416	الشبكات اللاسلكية والمحمولة	٢	٢	٣	٢٠	٢٠	٦٠
IT422	الرؤية بالحاسب	٢	٢	٣	٢٠	٢٠	٦٠
IT435	التطوير المتقدم للويب	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
IT486	المشروع	١,٥	٣	٣	٤٠	٦٠	
	إجمالى عدد الساعات الأسبوعية :	١١:٥	١٣	١٨			

المستوي الثالث : تخصص بحوث العمليات ودعم القرار

الفصل الدراسى: الأول التخصص : بحوث العمليات ودعم القرار								
الكود	اسم المقرر Course Name		عدد الساعات الدراسية أسبوعيا				النهاية العظمى للدرجات	
			محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
CS251	هندسة البرمجيات-١	Software Engineering-1	٢	٢	٣	٢٠	٢٠	٦٠
IS221	نظم قواعد البيانات-١	Database Systems-1	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
OD331	لبرمجة الخطية والصحيحة	Linear and Integer Programming	٢	٢	٣	٢٠	٢٠	٦٠
OD251	نظم دعم القراروتطبيقاتها		٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	إجمالى عدد الساعات الأسبوعية :		١٢	١٢	١٨			

الفصل الدراسى: الثانى التخصص : بحوث العمليات ودعم القرار								
الكود	اسم المقرر Course Name		عدد الساعات الدراسية أسبوعيا				النهاية العظمى للدرجات	
			محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
OD321	ادارة مشروعات		٢	٢	٣	٢٠	٢٠	٦٠
OD332	البرمجة غيرالخطية والديناميكية		٢	٢	٣	٢٠	٢٠	٦٠
OD341	النماذج العشوائية		٢	٢	٣	٢٠	٢٠	٦٠
OD451	نظرية القرارات والمباريات		٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢	Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	إجمالى عدد الساعات الأسبوعية :		١٢	١٢	١٨			

المستوي الرابع : تخصص بحوث العمليات ودعم القرار

الفصل الدراسى: الأول		التخصص: بحوث العمليات ودعم القرار						
الكود	اسم المقرر Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات			
		محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
OD453	مراقبة المخزون وادارة الانتاج	٢	٢	٣	٢٠	٢٠	٦٠
OD452	الادارة الاستراتيجية وادارة الازمات	٢	٢	٣	٢٠	٢٠	٦٠
OD431	البرمجة متعددة الاهداف	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
OD471	المشروع	١,٥	٣	٣	-	-	-
	إجمالى عدد الساعات الأسبوعية :	١١,٥	١٣	١٨			

الفصل الدراسى: الثانى		التخصص: بحوث العمليات ودعم القرار						
الكود	اسم المقرر Course Name	عدد الساعات الدراسية أسبوعيا			النهاية العظمى للدرجات			
		محاضرة	تمارين/ عملى	عدد الساعات المعتمدة	أعمال فصل	عملى وشفهى	تحريرى
OD 455	التنبؤ وتحليل التوقعات	٢	٢	٣	٢٠	٢٠	٦٠
OD454	نظم المعلومات الجغرافية لدعم القرار	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
	أختياري تخصصي - ٢ Selected-2	٢	٢	٣	٢٠	٢٠	٦٠
OD471	المشروع	١,٥	٣	٣	٤٠	٦٠	
	إجمالى عدد الساعات الأسبوعية :	١١,٥	١٣	١٨			