جامعة الزقازيق

كلية الحاسبات والمعلومات

اللائحة الداخلية لكلية الحاسبات والمعلومات
جامعة الزقازيق بنظام الساعات المعتمدة
(مرحلة الدراسات العليا)

2018

قائمة المحتويات

تمهيد

تم إنشاء كلية الحاسبات والمعلومات بجامعة الزقازيق بموجب قرار رئيس الجمهورية رقم (84) لسنة 1997م، حيث تم إصدار اللائحة الداخلية للكلية بموجب القرار الوزاري رقم (1209) بتاريخ 1998/9/17م بعد موافقة المجلس الأعلى للجامعات عليها بجلسته رقم (343) المنعقدة بتاريخ 1998/7/27 م. كما تم تعديل اللائحة الداخلية للكلية (مرحلتي البكالوريوس والدراسات العليا) بموجب القرار الوزاري رقم (2645) بتاريخ 2006/10/10م.

وتهدف الدراسات العليا بالكلية إلى إتاحة الفرصة لخريجي الكلية والكليات الأخرى لاستكمال دراستهم العليا في مجال الحاسبات والمعلومات. وقد روعي أن ترتبط مقررات دبلوم الدراسات العليا في الحاسبات والمعلومات بالاحتياجات الفعلية لسوق العمل. لذا تتسم طبيعة هذه المقررات بعلاقتها المباشرة بالتطبيقات المطلوبة لهذا السوق. بينما روعي في مقررات الدراسة لدرجتي ماجستير العلوم ودكتوراه الفلسفة في الحاسبات والمعلومات أن تكون ذات طبيعة أكاديمية وتطبيقية.

ويهدف تعديل اللائحة إلى بناء نظام تعليمي متطور يتلاءم مع النمو المتسارع في مجالات الحاسبات والمعلومات ومواكبة الاتجاهات العلمية الحديثة في مجالات التخصص وان يكون بنظام الساعات المعتمدة لما له من مزايا اكاديمية وعلمية.

أولاً: قواعد عامة

مادة (1): الشهادات والدرجات العلمية

أولاً: يمنح مجلس جامعة الزقازيق بناء على اقتراح مجلس كلية الحاسبات والمعلومات الشهادات والدرجات العلمية التالية:

أ- درجة دكتوراه الفلسفة في الحاسبات والمعلومات Doctor of Philosophy (Ph.D.)

في أحد التخصصات التالية:

1- علوم الحاسب
2- نظم المعلومات
3- نظم المعلومات الجغرافية والاستشعار عن بعد.
4- تكنولوجيا المعلومات
5- بحوث العمليات ودعم القرار

وتهدف دراسة هذه الدرجة العلمية إلى تنمية الفكر المستقل والقدرة على الابتكار والتطوير ومن ثم إضافة الجديد للعلم في الفرع والتخصص والموضوع الذي يختاره الطالب وذلك بإتباع الأصول العلمية التقنية والبحثية المتخصصة تخصصا دقيقا، وتعميق وإثراء القدرات البحثية التي تمت تنميتها في مرحلة ماجستير العلوم من خلال دراسة عدد من المقررات الأكاديمية المتقدمة وإجراء بحث علمي نظري وتطبيقي ذو إضافة علمية وتقديم رسالة علمية متكاملة طبقاً للقواعد الاكاديمية المتعارف عليها وذلك بما يتواكب مع الخطة البحثية للكلية. ويُحدد في شهادة التخرج عنوان رسالة دكتوراه الفلسفة والتخصص.

ب- درجة ماجستير العلوم في الحاسبات والمعلومات Master of Science (M.Sc.)

في أحد التخصصات التالية:

1- علوم الحاسب
2- نظم المعلومات
3- نظم المعلومات الجغرافية والاستشعار عن بعد.
4- تكنولوجيا المعلومات
5- بحوث العمليات ودعم القرار

وتهدف دراسة هذه الدرجة العلمية إلى تنمية القدرات البحثية والتفكير العلمي والتطوير في الفرع والتخصص والموضوع الذي يختاره الطالب من واقع الخطة البحثية للكلية وذلك باستخدام التقنيات والأساليب العلمية الحديثة من خلال دراسة عدد من المقررات الأكاديمية المتقدمة وإجراء بحث علمي نظري وتطبيقي ذو قيمة علمية وتقديم رسالة علمية متكاملة طبقاً للقواعد الاكاديمية المتعارف عليها. ويُحدد في شهادة التخرج عنوان رسالة ماجستير العلوم والتخصص.

ج- شهادة دبلوم الدراسات العليا Postgraduate Diploma

شهادة دبلوم الدراسات العليا في الحاسبات والمعلومات في أحد التخصصات التالية على أن يوضح التخصص في الشهادة:

1. دبلوم علوم الحاسب.
2. دبلوم نظم المعلومات.
3. دبلوم نظم المعلومات الجغرافية والاستشعار عن بعد.
4. دبلوم تكنولوجيا المعلومات.
5. دبلوم بحوث العمليات ودعم القرار.

ويهدف دبلوم الدراسات العليا في الحاسبات والمعلومات إلى رفع الكفاءة العلمية في المجالات التطبيقية للتخصصات الدقيقة في مجال الحاسبات والمعلومات من خلال مقررات تطبيقية وعملية متقدمة وإعداد مشروعات تطبيقية.

ويجوز أن تنظم الكلية برامج الدراسات العليا المشار إليها سابقا بالمشاركة والتعاون مع الجامعات المصرية الحكومية والخاصة والأهلية أو الجامعات الأجنبية المعترف بها من المجلس الأعلى للجامعات.

ثانياً: يجوز أن تنظم الكلية برامج أخرى للدراسات العليا مهنية أو اكاديمية متخصصة (دبلوم – ماجستير – دكتوراه) في تخصصات أقسام الكلية المختلفة وكذلك التخصصات البينية بين الأقسام طبقا لاحتياجات سوق العمل بحيث تكون مسايرة للتطوير في المجالات العلمية والتطبيقية في قطاع المعلوماتية وعلوم الحاسب وذلك بالتعاون مع الجامعات المصرية الحكومية والخاصة والأهلية أو الجامعات الأجنبية والشركات والمؤسسات العالمية في التخصص على ان تتبع الإجراءات النظامية للحصول على الموافقات الرسمية بذلك.

مادة (2): نظام الدراسة وعدد الساعات المعتمدة للحصول على الشهادات والدرجات العلمية

الدراسة بنظام الساعات المعتمدة، وعدد الساعات المعتمدة المطلوب اجتيازها كمتطلبات أساسية للحصول على كل درجة علمية كالتالي:

- يجب أن يجتاز الطالب (48) ساعة معتمدة (على الأقل) للحصول على درجة دكتوراه الفلسفة وفقا للجدول رقم (1)
- يجب أن يجتاز الطالب (36) ساعة معتمدة (على الأقل) للحصول على درجة ماجستير العلوم وفقا للجدول رقم (1)
- يجب أن يجتاز الطالب (30) ساعة معتمدة (على الأقل) للحصول على شهادة دبلوم الدراسات العليا

جدول (1): توزيع الساعات المعتمدة لدرجتي دكتوراه الفلسفة وماجستير العلوم

البيان	الساعات المعتمدة	
	دكتوراه الفلسفة	ماجستير العلوم
مقررات دراسية إجبارية للكلية	---	6
مقررات دراسية إجبارية للتخصص	6	6
مقررات دراسية اختيارية للتخصص	12	12
الامتحان الشامل	6	---
متابعة الرسالة (بحد أقصى 6 ساعات في الفصل الدراسي الواحد)	24	12
المجموع	48	36

مادة (3): مدد الدراسة للحصول على الشهادات والدرجات العلمية

- مدة الدراسة لنيل درجة دكتوراه الفلسفة هي ستة فصول دراسية أساسية على الأقل من تاريخ القيد ولا يجوز أن يبقى الطالب مقيداً لهذه الدرجة أكثر من عشرة فصول دراسية أساسية من تاريخ القيد مع مراعاة حالات وقف القيد/التسجيل.
- مدة الدراسة لنيل درجة ماجستير العلوم هي أربعة فصول دراسية أساسية على الأقل وثمانية فصول دراسية أساسية على الأكثر من تاريخ القيد مع مراعاة حالات وقف القيد/التسجيل.

- مدة الدراسة للحصول على دبلوم الدراسات العليا فصلين دراسيين أساسيين ولا تزيد عن أربعة فصول دراسية أساسية مع مراعاة حالات وقف القيد.
- يجوز زيادة مدة الدراسة لحالات خاصة يقبلها مجلس الكلية بناء على طلب المشرف وموافقة مجلس القسم المختص بالكلية وبعد سداد الرسوم المقررة وبحد اقصى أربعة فصول دراسية اساسية.

مادة (4): الرسوم الدراسية

تحدد الرسوم الدراسية ورسوم وقف القيد/التسجيل واعادة القيد/التسجيل ومد التسجيل وخلافه وتوقيتات سداد الرسوم بناءً على اقتراح مجلس الكلية وموافقة مجلس الجامعة.

مادة (5): الأحكام الانتقالية

- تطبق هذه اللائحة من تاريخ صدور القرار الوزاري باعتمادها على الطلاب المستجدين، أما الطلاب المقيدين بالدراسات العليا قبل هذا التاريخ فتسرى عليهم اللائحة الداخلية لعام 2006 والقواعد المتبعة المكملة لها.
- يطبق فيما لم يرد بشأنه نص في هذه اللائحة أحكام قانون تنظيم الجامعات رقم (49) لسنة 1972 ولائحته التنفيذية والقوانين المعدلة لهما وكذلك القرارات الوزارية المبنية على قرارات صادرة من المجلس الأعلى للجامعات.

مادة (6): مراحل الدراسة

تنقسم مراحل الدراسة بالدراسات العليا طبقا للهدف منها كما يلي:

اولاً: مرحلة القيد للدراسات العليا:

أ- دبلوم الدراسات العليا:

- هي مرحلة دراسة المقررات الدراسية الخاصة بدبلوم الدراسات العليا لجميع التخصصات وتنتهي بالنجاح في تلك المقررات. وهي مرحلة منتهية ولا يجوز التسجيل بناء عليها لدرجة ماجستير العلوم.

ب- ماجستير العلوم / دكتوراه الفلسفة:

- هي مرحلة دراسة مقررات الدرجة العلمية وتنتهي بالنجاح في تلك المقررات طبقاً لجدول رقم (1)، وهي شرط للتسجيل للدرجة العلمية.

ثانياً: مرحلة التسجيل لماجستير العلوم ودكتوراه الفلسفة:

- هي مرحلة تبدأ بعد الانتهاء من الدراسة والنجاح في مقررات الدرجة العلمية والتى تم دراستها في مرحلة القيد.

مادة (7): الفصول الدراسية

ينقسم العام الجامعي إلى فصلين دراسيين أساسيين هما:

- الفصل الدراسي الأول يسمى الفصل الخريفي (Fall Semester).
- الفصل الدراسي الثاني يسمى الفصل الربيعي (Spring Semester).
- يجوز لمجلس الكلية الموافقة على عقد فصل صيفي (Summer Semester) مكثف ويسمح بالتسجيل فيه فقط للطلاب الراسبين في مقرر أو أكثر في الفصلين الدراسيين الأول والثاني وفقا لما تسمح به إمكانيات وظروف الكلية.

ثانياً: مرحلة القيد للدراسات العليا

مادة (8): مواعيد فتح باب القيد

- يتم الإعلان عن فتح باب القيد للدراسات العليا في بداية شهر أغسطس من كل عام ولمدة يحددها مجلس الكلية.
- ويجوز الاعلان عن فتح باب القيد في بداية شهر يناير بالنسبة للفصل الدراسي الثاني ولمده يحددها مجلس الكلية وذلك وفقا لما تسمح به إمكانيات وظروف الكلية.
- يتم القيد لأي مرحلة دراسية بناء على موافقة مجلس القسم العلمي المختص واعتماد مجلس الكلية وبعد سداد الرسوم المقررة بحيث لا تتجاوز موعد بداية الدراسة والتي يحددها مجلس الكلية.
- تقدم طلبات الالتحاق لإدارة الدراسات العليا بالكلية بعد استيفاء الأوراق المطلوبة.
- يتم مراعاة القواعد المنظمة التي يحددها مجلس الجامعة.

مادة (9): شروط القيد

يشترط للقيد في الدراسات العليا بالكلية ما يلي:

- بالنسبة للقيد في دبلوم الدراسات العليا وماجستير العلوم: يجب أن يكون الطالب حاصلا على درجة البكالوريوس في الحاسبات والمعلومات أو بكالوريوس الهندسة تخصص هندسة الحاسبات أو هندسة الاتصالات وكذلك بكالوريوس علوم تخصص علوم حاسب أو على درجة معادلة لأي منهم من جامعة أخرى داخل أو خارج مصر ومعترف بها من المجلس الأعلى للجامعات.
- ماجستير العلوم: يشترط حصول الطالب على تقدير تراكمي جيد على الأقل في مرحلة البكالوريوس أو دبلوم الدراسات العليا في نفس التخصص المطلوب القيد فيه.
- دكتوراه الفلسفة: يجب أن يكون الطالب حاصلا على درجة ماجستير العلوم في الحاسبات والمعلومات أو على درجة معادلة لها من كليات الحاسبات والمعلومات من جامعة أخرى داخل أو خارج مصر ومعترف بها من المجلس الأعلى للجامعات.
- الحصول على موافقة مجلس القسم المختص واستكمال المستندات المطلوبة من إدارة الدراسات العليا طبقاً للوائح والقواعد المنظمة الخاصة بالجامعة.
- يجوز لمجلس القسم المختص أن يضيف شروطا أخرى يراها ضرورية للقبول، مثل إجراء امتحان شفهي أو تحريري للطلاب الجدد وتحديد عدد الطلاب المقبولين حسب الإمكانيات المتاحة بالقسم

والكلية. كما يجوز أن يقرر القسم مقررات اضافية كشرط لقبول الطالب بحد أقصى أربعة مقررات دراسية.

- يجوز لمجلس الكلية بناء على اقتراح مجلس القسم المختص احتساب مقررات سبق للطالب دراستها (بالكلية أو خارجها) فى درجة مماثلة والنجاح فيها خلال الثلاث سنوات السابقة لقيده بالدراسات العليا بالكلية إذا تم معادلتها بالمقررات المطلوب دراستها وبشرط ألا يتجاوز عدد ساعات هذه المقررات 50% من إجمالي عدد ساعات المقررات المطلوب دراستها.
- بالنسبة للطلاب الوافدين يتولى مجلس الجامعة بعد اخذ رأى مجلس الكلية تحديد شروط قبولهم من حيث التقدير العام في مرحلة البكالوريوس وباقي شروط القبول.

مادة (10): إلغاء القيد

يتم إلغاء قيد الطالب في مراحل دراسة مقررات دبلوم الدراسات العليا ومقررات ماجستير العلوم ودكتوراه الفلسفة بناء على اقتراح وكيل الكلية للدراسات العليا والبحوث واعتماد مجلس الكلية في الحالات الآتية:

- إذا استنفذ الطالب فرص التسجيل المنصوص عليها في اللائحة في مقرر دون النجاح به.
- إذا أنقطع عن الدراسة فصلين دراسيين متتابعين أو منفصلين بدون عذر يقبله مجلس الكلية.
- حالات الغش أو الشغب المثبتة بمحاضر معتمدة وطبقاً للقواعد التي يحددها مجلس الكلية.
- إذا تقدم المشرفين على الطالب بتقرير يفيد بعدم تقدمه فى الرسالة لمدة اربعة فصول متتالية.
- إذا تقدم الطالب بطلب لإلغاء قيده بالدراسات العليا.
- إذا لم يسدد الرسوم الدراسية المقررة عليه في المواعيد المحددة لذلك.
- حالات أخرى يحددها مجلس الكلية.

مادة (11): إعادة القيد

يتم إعادة قيد الطالب (إذا تقدم بطلب إعادة القيد طبقا للوائح والقواعد وفي المواعيد المعلنة بالكلية) في الحالات التالية:

- إذا تم إلغاء قيد الطالب بناء على طلبه، ويجوز لمجلس الكلية بناء على اقتراح المرشد الأكاديمي للطالب وموافقة مجلس القسم المختص، الموافقة على إعادة القيد وبشرط عدم مرور أكثر من عام على تاريخ موافقة مجلس الكلية على إلغاء القيد ولا يعتبر قيداً جديداً للدرجة وإنما استكمال للقيد السابق مع عدم احتساب فترة إلغاء القيد ضمن الحد الأقصى للحصول على الدرجة.

- إذا انقطع عن الدراسة وتقدم بعذر يقبله مجلس الكلية وبحد أقصى فصلين دراسيين متتابعين أو منفصلين وبعد سداد الرسوم الدراسية عن الفصول الدراسية المنقطع عنها ولا تحسب تلك الفصول ضمن الحد الأقصى للحصول على الدرجة.

مادة (12): الإرشاد الأكاديمي

- يحدد مجلس القسم المختص لكل طالب مرشدا أكاديميا من أعضاء هيئة التدريس من نفس التخصص الذي يرغب الطالب القيد فيه وذلك لتقديم النصح والإرشاد خلال فترة الدراسة وللمساعدة في اختيار المقررات الدراسية اللازمة لمجال البحث.
- يقوم المرشد الأكاديمي بمتابعة الطالب دوريا خلال فترة دراسة المقررات.

مادة (13): العبء الأكاديمي

- الحد الأقصى لتسجيل المقررات خلال الفصل الدراسي الواحد هو 5 مقررات (15 ساعة معتمدة) والحد الأدنى 3 مقررات (9 ساعات معتمدة)
- يجوز السماح بتسجيل أقل من ثلاثة مقررات في حالة التخرج او فى حالة عدم طرح مقررات باقية للطالب لدراستها فى ذات الفصل فقط.
- الحد الأقصى لتسجيل المقررات خلال الفصل الصيفي هو مقررين (6 ساعة معتمدة).

مادة (14): الساعات المعتمدة للمقررات الدراسية

أولا دكتوراه الفلسفة:

- يجب أن يجتاز الطالب (18) ساعة معتمدة في دراسة مقررات دكتوراه الفلسفة موزعة على مقررات إجبارية واختيارية للتخصص كما يلي:

الساعات المعتمدة	البيان
6	مقررات دراسية إجبارية للتخصص
12	مقررات دراسية اختيارية للتخصص
18	إجمالي

- يجوز للمرشد الأكاديمي الموافقة على تسجيل الطالب لمقررين دراسيين من المقررات التي تطرحها الأقسام الأخرى لدرجة دكتوراه الفلسفة وذلك ضمن المقررات الاختيارية.

ثانيا ماجستير العلوم:

- يجب أن يجتاز الطالب (24) ساعة معتمدة في دراسة مقررات ماجستير العلوم موزعة على مقررات إجبارية للكلية ومقررات إجبارية واختيارية للتخصص كما يلي:

الساعات المعتمدة	البيان
6	**مقررات دراسية إجبارية للكلية**
6	**مقررات دراسية إجبارية للتخصص**
12	**مقررات دراسية اختيارية للتخصص**
24	**إجمالي**

- يجوز للمرشد الأكاديمي الموافقة على تسجيل الطالب لمقررين دراسيين على الأكثر من المقررات التي تطرحها الأقسام الأخرى لدرجة ماجستير العلوم وذلك ضمن المقررات الاختيارية.

ثالثا دبلوم الدراسات العليا:

- يجب أن يجتاز الطالب (30) ساعة معتمدة في دراسة مقررات دبلوم الدراسات العليا منها 6 ساعات معتمدة لمشروع التخرج

مادة (15): قواعد النظام الكودي لأرقام المقررات

يتكون كود أي مقرر من الرمز الكودي للتخصص، يلي ذلك عدد مكون من ثلاثة أرقام كما يلي:

- الرقم أقصى اليسار يمثل المستوى الدراسي
- الرقم في خانة العشرات والآحاد يستخدم لتمييز المقررات التي تدرس لنفس المستوى الدراسي

أكواد المستويات الدراسية

المستوى الدراسي	الكود
دبلوم الدراسات العليا	5
ماجستير العلوم	6
دكتوراه الفلسفة	7

النظام الرمزي للتخصص

التخصص	الرمز
عام	GN
علوم الحاسب	CS
نظم المعلومات	IS
نظم المعلومات الجغرافية والاستشعار عن بعد	GIS
تكنولوجيا المعلومات	IT
بحوث العمليات ودعم القرار	DS

مادة (16): تسجيل المقررات

يتم تسجيل المقررات الدراسية لكل مرحلة (دبلوم الدراسات العليا – ماجستير العلوم– دكتوراه الفلسفة) في بداية كل فصل دراسي بعد موافقة المرشد الأكاديمي وباعتماد مجلس القسم المختص طبقا للضوابط التي يحددها مجلس الكلية.

مادة (17) حذف وتعديل وإضافة المقررات

يجوز للطالب بعد إكمال إجراءات التسجيل أن يحذف أو يعدل أو يضيف مقررا أو أكثر ويتم ذلك بموافقة المرشد الأكاديمي للطالب وباعتماد مجلس القسم المختص وطبقاً للضوابط التي يحددها مجلس الكلية.

مادة (18) الانسحاب من المقرر

يجوز للطالب الانسحاب من المقرر (ولا ترد له الرسوم) خلال فترة يحددها مجلس الكلية وذلك بعد موافقة المرشد الأكاديمي واعتماد مجلس القسم المختص. وفى هذه الحالة لا يعد الطالب راسبا في المقررات التي انسحب منها ويحتسب له أنه "منسحب" فقط ويتعين على الطالب في هذا الحالة إعادة المقرر مع الالتزام بجميع القواعد المعمول بها للتسجيل بمقرر جديد وتسديد رسوم جديدة.

مادة (19): الانقطاع عن الدراسة

يعتبر الطالب منقطعاً عن الدراسة إذا تغيب عن الحضور في جميع مقررات الفصل الدراسي بدون عذر مقبول أو لم يسجل المقررات في فصل دراسي خلال مواعيد التسجيل المقررة ويحتسب الفصل الدراسي المنقطع عنه الطالب ضمن الحد الأقصى للفصول الدراسية للحصول على الدرجة.

مادة (20): تأجيل الدراسة

يحق للطالب تأجيل الدراسة أثناء حصوله على المقررات وذلك وفقا لما يلي:

- تقدم طلبات تأجيل الدراسة في مواعيد تسجيل المقررات المحددة.
- في حالة الموافقة يثبت للطالب في سجله الأكاديمي الموافقة على التأجيل في ذلك الفصل.
- يجوز للطالب أن يؤجل دراسة المقررات في الكلية لمدة لا تزيد عن فصلين دراسيين إلا في الحالات الاستثنائية التي يقبلها مجلس الكلية وبحد أقصى فصليين دراسيين إضافيين.
- لا تحسب مدة تأجيل الدراسة ضمن المدة المسموح بها للحصول على الدرجة العلمية.
- إذا انقضت فترة تأجيل الدراسة الموافق عليها، ولم يتقدم الطالب بطلب لإعادة تسجيل المقررات أو مد تأجيل الدراسة يعتبر منقطعا عن الدراسة ما لم يتقدم بعذر يقبله مجلس الكلية ويسجل ذلك في سجله الأكاديمي.

يعاد تسجيل الطالب بعد تقدمه بطلب لإعادة تسجيل المقررات وذلك في مواعيد التسجيل المحددة.

مادة (21): نظام وضوابط الامتحانات

- يعقد الامتحان النهائي في نهاية كل فصل دراسي، وعلى الطالب أن يؤدى الامتحانات المقررة طبقا للجداول المعلنة والمعتمدة من مجلس الكلية.
- الامتحان النهائي امتحانا تحريرياً في جميع المقررات ويجوز لمجلس الكلية وبناء على اقتراح الأقسام المختصة، الموافقة على عقد الامتحان النهائي بنظام الكتاب المفتوح (Open Book) أو الامتحان الإلكتروني (Computer– Based Exam).
- النهاية العظمى لكل مقرر 100 درجة يخصص منها 25 درجة لأعمال السنة (التمارين العملية، الأبحاث، السيمنارات، والاختبارات الشفوية) و75 درجة للامتحان النظري، وذلك وفقا لتوصيف المقرر المعتمد من مجلس الكلية.

- يجوز تأجيل الامتحان النهائي للطالب إذا ما تقدم بعذر يقبله مجلس الكلية خلال فترة أقصاها عشرة أيام من تاريخ عقد الامتحان النهائي وترصد درجة الطالب في المقرر المؤجل امتحانه "غير مكتمل IC"، وذلك في حالة حصول الطالب على 60% من اعمال السنة على الأقل في المقرر وإلا يعتبر الطالب منسحب من المقرر W. وفى حالة حصول الطالب على تقدير "غير مكتمل IC" يحتفظ بأعمال السنة الحاصل عليها ويؤدى الامتحان النهائي فقط. على أن يؤدي الطالب الامتحان في أول مرة يتم عرض هذا المقرر للتسجيل، وإلا اعتبر راسباً في المقرر.

مادة (22): التقديرات

- يعتبر الطالب ناجحا في مقرر إذا حصل على تقدير (D) على الأقل فى مقررات درجة الدبلوم.
- يعتبر الطالب ناجحا في مقرر إذا حصل على تقدير (D^+) على الأقل فى مقررات درجة الماجستير العلوم.
- يعتبر الطالب ناجحا في مقرر إذا حصل على تقدير (C) على الأقل فى مقررات درجة الدكتوراه الفلسفة.
- الطالب الذي يرسب في أي مقرر إجباري عليه إعادة دراسة ذلك المقرر وفى حالة رسوبه في أي مقرر اختياري فعليه إعادة دراسة ذلك المقرر أو اختيار مقرر اخر بديل وفى كل الحالات يحتسب له التقدير بحد أقصى (D) لمقررات درجة الدبلوم و(D^+) لمقررات درجة ماجستير العلوم و(C) لمقررات درجة دكتوراه الفلسفة.

النسبة المئوية للدرجة الحاصل عليها الطالب	النقاط	الرمز	التقدير
95% – فأكثر	4	A^+	ممتاز
90% – أقل من 95%	3.7	A	ممتاز
85% – أقل من 90%	3.3	B^+	جيد جدا
80% – أقل من 85%	3	B	جيد جدا
75% – أقل من 80%	2.7	C^+	جيد
70% – أقل من 75%	2.4	C	جيد
65% – أقل من 70%	2.2	D^+	مقبول
60% – أقل من 65%	2	D	مقبول
أقل من 60%	صفر	F	راسب

- تحسب أوزان تقديرات المقررات على النحو التالي:

- يتم حساب مجموع نقاط المقرر على أساس حاصل ضرب عدد النقاط التي يحصل عليها الطالب في عدد الساعات المعتمدة للمقرر وذلك لأقرب رقمين عشريين.
- المعدل الفصلي هو متوسط ما يحصل عليه الطالب من مجموع نقاط في الفصل الدراسي، ويحسب على أساس حاصل قسمة مجموع النقاط للمقررات المسجلة في الفصل الدراسي على إجمالي عدد الساعات المعتمدة للمقررات المسجلة في نفس الفصل وذلك لأقرب رقمين عشريين.

الرموز التي ليس لها نقاط ولا تدخل في حساب المعدل التراكمي فهي كالتالي:

الرمز	التقويم	ملاحظات
IC	غير مكتمل	يجب إكمال متطلبات المقرر مع أول عرض له في الفصول الدراسية التالية
W	منسحب	إذا كان الانسحاب بعد الموعد المحدد تتغير "W" إلى"F"
IP	مستمر	مقرر يستمر لأكثر من فصل دراسي
TC	مقرر منقول	مقرر تم دراسته خارج الجامعة

- لا تدخل المقررات التي درسها الطالب في جامعة أخرى في حساب متوسط النقاط إلا إذا تم معادلتها من قبل مجلس القسم المختص وموافقة مجلس الكلية.
- يمنح الطالب شهادة بتقديرات المقررات وبيان الدرجات باللغة العربية أو باللغة الانجليزية وفقا لطلبة بعد سداد الرسوم المقررة لذلك.

مادة (23): مشروع التخرج لدبلوم الدراسات العليا

يقوم طلاب دبلوم الدراسات العليا بإعداد مشروع للتخرج خلال فترة الدراسة وتحدد مجالس الأقسام المختصة موضوعه بإشراف المرشد الأكاديمي ويقوم مجلس الكلية بناء على اقتراح الأقسام المختصة بتشكيل لجان مناقشة وتقييم المشاريع شفهيا.

مادة (24): التقدير العام التراكمي

يتم حساب تقدير التراكمي كما يلي:

- يتم حساب متوسط ما يحصل عليه الطالب من مجموع نقاط المقررات التي درسها، ويتم حسابه على أساس مجموع نقاط جميع المقررات المسجلة خلال الفترات الدراسية السابقة لحساب المعدل مقسوماً على مجموع عدد الساعات المعتمدة المسجلة خلال الفترات السابقة وذلك لأقرب رقمين عشريين.

- الطالب الذي يرسب في مقرر أكثر من مرة يكتفى باحتساب المقرر مرة واحده في معدله التراكمي مهما تعددت مرات الرسوب وتسجل مرات الرسوب في سجله الأكاديمي.
- يتم حساب التقدير العام للتخرج طبقا للجدول التالي:

التقدير العام		المعدل التراكمي	
الرمز	التقدير	النسبة المئوية	النقاط
A	ممتاز	90 فأكثر	3.7 فأكثر
B	جيد جدا	80 – أقل من 90	3 – أقل من 3.7
C	جيد	70 – أقل من 80	2.3 – أقل من 3
D	مقبول	60 – أقل من 70	2 – أقل من 2.3
F	ضعيف	أقل من 60	أقل من 2

ثالثاً: مرحلة التسجيل لدرجتي ماجستير العلوم ودكتوراه الفلسفة

مادة (25): شروط التسجيل لرسالتي ماجستير العلوم ودكتوراه الفلسفة

- بعد اجتياز الطالب المقررات المطلوبة يقدم الطالب سيمناراً كشرط للتسجيل، يعرض فيه مقترح موضوع وخطة البحث.
- يتولى المرشد الأكاديمي للطالب أو أحد اعضاء هيئة التدريس والذي يحدده القسم المختص مساعدته في اختيار موضوع البحث والإشراف علية في مرحلة السيمنار وكتابة مقترح بحث الرسالة.
- يحق للقسم المختص اقتراح تعديلات على موضوع البحث وتقديم المقترحات اللازمة لإخراج البحث بالشكل المطلوب، على أن يتم التسجيل للرسالة في اجتماع مجلس القسم التالي لتاريخ اجتياز السيمنار. ولا يحق للقسم العلمي ان يطلب من الطالب إعادة السيمنار أكثر من مرتين خلال شهرين من تاريخ اول سيمنار وفى حالة عدم الاجتياز يعطى الطالب فرصة أخيرة عن طريق لجنة تشكل بمعرفة مجلس الكلية والا يلغى قيده.
- يجب أن يسجل الطالب للدرجة خلال الفصلين الدراسيين التاليين لنجاحه في المقررات المطلوبة للدرجة، وفي حالة عدم تسجيله، لمجلس الكلية بعد أخذ رأي القسم أن يعطى للطالب فرصة التسجيل المتأخر خلال الفصل التالي مباشرة بعد سداد الرسوم المقررة.

مادة (26): مدد وساعات تسجيل الرسالة

أ- دكتوراه الفلسفة:

- يسجل الطالب 6 ساعات معتمدة تحت مسمى (متابعة رسالة دكتوراه الفلسفة) في الفصل الدراسي الواحد، ولمدة اربعة فصول دراسية على الأقل.
- يحق لطالب دكتوراه الفلسفة تسجيل 6 ساعات معتمدة تحت مسمى (الامتحان الشامل) بالإضافة لساعات متابعة الرسالة وذلك في أحد الثلاثة فصول التالية للتسجيل بمجموع 12 ساعة معتمدة (6 ساعات معتمدة متابعة رسالة دكتوراه الفلسفة + 6 ساعات معتمدة الامتحان الشامل).

ب- ماجستير العلوم:

- يسجل طالب ماجستير العلوم 6 ساعات معتمدة تحت مسمى (متابعة رسالة ماجستير العلوم) في الفصل الدراسي الواحد ولمدة فصلين دراسيين على الأقل.

مادة (27): السيمنارات

قواعد عامة:

- يقوم الطالب خلال فترة تسجيله لدرجتي ماجستير العلوم ودكتوراه الفلسفة بتقديم سيمناراً في نهاية كل فصل دراسي للجنة الاشراف كشرط لاجتياز الساعات المسجلة والتسجيل في الفصل الدراسي التالي، وإذا لم يجتاز السيمنار يعتبر راسبا ويعيد تسجيل 6 ساعات معتمدة مرة أخرى بعد سداد الرسوم المقررة ولا تحسب هذه الساعات ضمن الحد الأقصى للحصول على الدرجة.
- يقدم الطالب عند انتهائه من البحث، سيمناراً كأحد متطلبات تشكيل لجنة المناقشة والحكم.

مادة (28): الامتحان الشامل

- يشكل مجلس الكلية لجنة امتحان شامل للطالب بناء على اقتراح لجنة الاشراف على الرسالة وموافقة مجلس القسم المختص مكونة من خمس أساتذة أو أساتذة مساعدين من بينهم المشرف الرئيسي أو من ينوب عنه من لجنة الاشراف ويتم اختيارهم بحيث تتنوع تخصصاتهم حول المجال العام للطالب ويكون أقدم الأساتذة في اللجنة مقررا لها، ويكون الامتحان شفهيا أو تحريرا أو كلاهما (كما تقرر اللجنة) ويكون اجتياز الطالب بأربعة أصوات كحد أدني من آراء اللجنة.
- يجب أن يجتاز الطالب الامتحان الشامل، وفي حالة عدم اجتيازه، لمجلس الكلية بعد أخذ رأي القسم واقتراح اللجنة أن يعطى للطالب فرصة التسجيل مرة أخرى فقط للامتحان الشامل في الفصل الدراسي التالي بعد سداد الرسوم المقررة ولا تحسب هذه الساعات ضمن الحد الأقصى للحصول على الدرجة.

مادة (29): إيقاف التسجيل لرسالتي ماجستير العلوم ودكتوراه الفلسفة

يجوز للطالب أن يوقف تسجيله للرسالة العلمية وفقا للضوابط التي يقررها مجلس الجامعة ويشترط تقديمها قبل انتهاء المدة الأصلية للتسجيل ولا يكون عن مدة سابقة. ولا تحسب مدة إيقاف الدراسة ضمن المدة المسموح بها للحصول على الدرجة. ويجوز لمجلس الكلية بناء على اقتراح مجلس القسم المختص ولجنة الدراسات العليا أن يوقف تسجيل الطالب وذلك في الحالات الآتية:

- حالات الاستدعاء للتجنيد للقوات المسلحة، وعلى الطالب أن يتقدم بطلب إيقاف تسجيله طوال مدة استدعائه للتجنيد مدعما بالمستندات الدالة على ذلك.

- السفر للخارج في مهمة رسمية أو منحة تدريبية عن طريق جهة العمل، وعلى الطالب أن يتقدم بطلب قبل سفره مدعما بالمستندات الدالة على ضرورة سفره لأكثر من شهر.
- الحالات المرضية بشرط أن يتقدم الطالب بالشهادات المرضية اللازمة معتمدة من الإدارة الطبية للجامعة ومحددا فيها فترة مرضه على ألا تقل عن شهر.
- مرافقة الزوج / الزوجة للسفر للخارج وعلى الطالب أن يقدم ما يثبت ذلك.
- أجازة الوضع ورعاية الطفل، وعلى الطالبة أن تتقدم بطلب وقف التسجيل مدعما بشهادة ميلاد الطفل.
- حالات أخرى يقبلها مجلس الكلية.

مادة (30): الاستمرار في الدراسة

- على الطالب أن يسجل في بداية كل فصل دراسي للاستمرار في الدراسة وذلك في مواعيد التسجيل المحددة ووفقا للقواعد التي يضعها مجلس الكلية.
- في حالة عدم تسجيله، لمجلس الكلية بعد أخذ رأي القسم أن يعطى للطالب فرصة التسجيل المتأخر بعد سداد الرسوم المقررة، وذلك فى خلال اسبوعين من انتهاء فترة التسجيل، وبحد أقصى مرتين للتسجيل المتأخر.

مادة (31): الإشراف الأكاديمي

عند التقدم للتسجيل لماجستير العلوم أو دكتوراه الفلسفة يعين مجلس الكلية بناء على توصية مجلس القسم المختص لجنة الإشراف على الطالب بعد إقرار السيمنار، طبقا للضوابط التالية:

- أن يكون المشرف الرئيسي من بين الأساتذة أو الأساتذة المساعدين من داخل أو خارج الجامعة على ألا يزيد عدد أعضاء لجنة الإشراف عن ثلاثة مشرفين بالنسبة لرسائل ماجستير العلوم وأربعة مشرفين بالنسبة لرسائل دكتوراه الفلسفة.
- يجوز أن يعاون في الإشراف أعضاء هيئة تدريس من خارج الجامعة والذين يعملون داخل أو خارج جمهورية مصر العربية وبما لا يتعارض مع القواعد المنظمة لذلك.
- لا يجوز لعضو هيئة التدريس الاشتراك في لجنة الإشراف على الرسائل العلمية لأحد أقاربه حتى الدرجة الرابعة وينطبق ذلك على الامتحانات وحلقات البحث وتشكيل لجان الحكم والمناقشة.

- يحتفظ باسم المشرف المتوفى على أن يستحق ورثة هذا المشرف جزء من مكافأة الاشراف بما يتماشى مع المدة التي قضاها في الاشراف وطبقاً للوائح المنظمة لذلك، على أن يكون قد مضى عام دراسي على الأقل فى الإشراف على الرسالة.
- لمجلس الكلية التوصية بتعديل لجنة الإشراف بالرفع أو بالإضافة أو بكليهما بناء على اقتراح لجنة الإشراف مشفوعا بأسباب التعديل وموافقة مجلس القسم المختص واعتماد التعديل من الجهة المختصة بالجامعة بما لا يتعارض مع ما سبق من نقاط بهذا البند.

مادة (32): اعداد الرسالة

- يجب أن يجري الطالب دراسة في أحد موضوعات التخصص تنتهي بإعداد رسالة تقبلها لجنة المناقشة والحكم، ويشترط لإجازتها أن تكون عملاً ذا قيمة علمية وتطبيقية بالنسبة لماجستير العلوم، وعملاً به إضافة علمية بالنسبة لدكتوراه الفلسفة.
- يجب أن يقوم الطالب بنشر أو تقديم ما يفيد قبول للنشر لعدد من الابحاث بالمجلات العلمية أو المؤتمرات العلمية المحلية أو الدولية المحكمة في مجال تخصصه يقرها القسم العلمي قبل عقد السيمنار النهائي وطبقا للقواعد التي يحددها مجلس الجامعة في هذا الشأن.
- لا يجوز مناقشة الرسالة إلا بعد مرور (24) شهراً من تاريخ موافقة مجلس الكلية على تسجيل الرسالة بالنسبة لدكتوراه الفلسفة و (12) شهراً بالنسبة لماجستير العلوم.
- يجوز لمجلس القسم المختص بناء على طلب من لجنة الإشراف أن يوافق على إجراء تعديل على البحث ولمرة واحدة فقط خلال الدراسة ويعتمد ذلك التعديل من الجهة المختصة بالجامعة بعد موافقة مجلس الكلية وطبقا للقواعد التي يحددها مجلس الجامعة في هذا الشأن.

مادة (33): تشكيل لجان المناقشة والحكم

- تقدم لجنة الاشراف تقريرا علميا عن انتهاء الرسالة ومدى صلاحيتها للعرض على لجنة المناقشة والحكم.
- يقوم الباحث بعقد سيمنار أمام لجنة مشكلة من قبل مجلس القسم، وعند إقرار اللجنة بصلاحية الرسالة للمناقشة، يقترح مجلس القسم تشكيل للجنة المناقشة والحكم.
- يشكل مجلس الكلية لجنة المناقشة والحكم على الرسالة بناءً على اقتراح لجنة الإشراف وموافقة مجلس القسم المختص، من ثلاثة أعضاء احدهم المشرف على الرسالة والعضوان الآخران من بين

الأساتذة أو الأساتذة المساعدين ويكون رئيس اللجنة أقدم الأساتذة من أعضاء اللجنة في التخصص، وفى حالة تعدد المشرفين يجوز أن يشتركوا في اللجنة على أن يكون لهم صوت واحد. ويجوز أن يكون العضوان أو أحدهما من الأساتذة السابقين أو ممن في مستواهم العلمى وذلك بشرط على أن يكون أحدهما على الأقل من خارج الكلية بالنسبة لماجستير العلوم ومن خارج الجامعة بالنسبة لدكتوراه الفلسفة وطبقاً للقواعد التي يحددها مجلس الجامعة في هذا الشأن.

- تكون مدة صلاحية تشكيل لجنة المناقشة والحكم ثلاثة أشهر من تاريخ اعتماد الجهة المختصة بالجامعة ويجوز مدها لأسباب يوافق عليها مجلس الكلية ويعتمد المد من الجهة المختصة بالجامعة وبما يتماشى مع قرارات مجلس الجامعة في هذا الشأن.
- لا يجوز مناقشة الرسالة إلا بعد انقضاء فترة لا تقل عن خمسة عشر يوما من تاريخ اعتماد الجهة المختصة بالجامعة لتشكيل لجنة المناقشة والحكم.
- يقدم كل عضو من أعضاء لجنة المناقشة والحكم تقريرا علميا منفردا عن الرسالة ومدى صلاحيتها للمناقشة وقبل موعد المناقشة بأسبوع على الأقل وتقدم اللجنة مجتمعة تقريرا علميا مفصلا عن الرسالة بعد مناقشتها.
- تكون مناقشة الرسائل علنية إلا فيما يخص المحكم الأجنبي الجنسية الذي يمكن الاكتفاء بتقرير كتابي منه عن الرسالة وتعرض جميع التقارير على مجلس القسم المختص تمهيداً لعرضها على مجلس الكلية ويراعى أن يوقع التقرير من جميع أعضاء لجنة المناقشة والحكم ويتضمن أحد التوصيات الآتية:
  - قبول الرسالة والتوصية بمنح الدرجة.
  - قبول الرسالة مع إجراء بعض التعديلات دون مناقشتها مرة اخرى على أن يكلف أحد أعضاء لجنة المناقشة والحكم بالتأكد من إجراء التعديلات المطلوبة خلال ثلاثة أشهر على الأكثر والتوصية بمنح الدرجة.
  - عدم قبول الرسالة مع التوصية بإجراء التعديلات الجوهرية المطلوبة وإعادة مناقشة الرسالة بعد ستة أشهر على الأقل وعام على الأكثر.
  - عدم قبول الرسالة مع التوصية بإلغاء التسجيل.

مادة (34): شروط منح الدرجة العلمية

يوصى مجلس الكلية بناء على توصية مجلس القسم المختص بمنح درجة ماجستير العلوم / دكتوراه الفلسفة في الحاسبات والمعلومات في حالة استيفاء الطالب الشروط التالية:

أولاً: درجة دكتوراه الفلسفة

- مرور (36) شهر على الأقل من بدء القيد.
- مرور (24) شهر على الأقل من تاريخ موافقة مجلس الكلية على التسجيل للرسالة.
- اجتياز الطالب للامتحان الشامل.
- يجب أن يقوم الطالب بنشر أو تقديم ما يفيد قبول للنشر لعدد من الابحاث بالمجلات العلمية أو المؤتمرات العلمية المحلية أو الدولية المحكمة في مجال تخصصه يقرها القسم العلمي وطبقا للقواعد التي يحددها مجلس الجامعة في هذا الشأن.
- قبول الرسالة من لجنة المناقشة والحكم والتوصية بمنح الدرجة.
- اجتياز الطالب لاختبار اللغة الإنجليزية طبقا للشروط التي يحددها مجلس الجامعة.

ثانياً: درجة ماجستير العلوم

- مرور (24) شهر على الأقل من بدء القيد.
- مرور (12) شهر على الأقل من تاريخ موافقة مجلس الكلية على التسجيل للرسالة.
- يجب أن يقوم الطالب بنشر أو تقديم ما يفيد قبول للنشر لعدد من الابحاث بالمجلات العلمية أو المؤتمرات العلمية المحلية أو الدولية المحكمة في مجال تخصصه يقرها القسم العلمي وطبقا للقواعد التي يحددها مجلس الجامعة في هذا الشأن.
- قبول الرسالة من لجنة المناقشة والحكم والتوصية بمنح الدرجة.
- اجتياز الطالب لاختبار اللغة الإنجليزية طبقا للشروط التي يحددها مجلس الجامعة.

رابعاً: الملاحق
ملحق رقم (1)
المقررات الدراسية لمرحلة
دبلوم الدراسات العليا

دبلوم علوم الحاسب

(30 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
CS 511	تصميم مترجمات	Compiler Design	3
CS 512	المعلوماتية الحيوية	Bioinformatics	3
CS 513	نظم التشغيل	Operating Systems	3
CS 514	الذكاء الاصطناعي	Artificial Intelligence	3
CS 515	أداء نظم الحاسب	Computer Systems Performance	3
CS 516	نظرية التعقيد	Complexity Theory	3
CS 517	تصميم وتحليل الخوارزميات المتوازية	Parallel Algorithm Design and Analysis	3
CS 518	موضوعات مختارة في علوم الحاسب	Selected Topics in Computer Science	3
CS 530	مشروع الدبلوم	Diploma Project	6

دبلوم نظم المعلومات

(30 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
IS 511	التنقيب عن البيانات لتحليل الاعمال	Data Mining for Business Analytics	3
IS 512	ذكاء الأعمال	Business Intelligence	3
IS 513	تنظيم وإدارة قواعد البيانات	Database Management and Administration	3
IS 514	مبادئ سرية وأمان وضمان المعلومات	Principles of Information Assurance, Security and Privacy	3
IS 515	الحوسبة السحابية وتقنيات البيانات	Cloud Computing and Data Technologies	3
IS 516	استراتيجية نظم الأعمال الإلكترونية	E-Business System Strategy	3
IS 517	تحليل وتصميم نظم المعلومات	Information Systems Analysis and Design	3
IS 518	موضوعات مختاره فى نظم المعلومات	Selected Topics in Information Systems	3
IS 530	مشروع الدبلوم	Diploma Project	6

دبلوم نظم المعلومات الجغرافية والاستشعار عن بعد

(30 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
GIS 511	علوم ونظم المعلومات الجغرافية	Geographic Information Science and Systems	3
GIS 512	الاستشعار عن بعد	Remote Sensing	3
GIS 513	التحليل والنمذجة المكانية	Spatial Analysis and Modeling	3
GIS 514	تصميم وتنظيم وإدارة قواعد البيانات الجغرافية	Geodatabase Design, Management and Administration	3
GIS 515	تقنيات الحصول على البيانات المكانية	Spatial Data Acquisition Techniques	3
GIS 516	إدارة وتنفيذ نظم المعلومات الجغرافية	GIS Management and Implementation	3
GIS 517	برمجة وتخصيص نظم المعلومات الجغرافية	GIS Programming and Customization	3
GIS 518	موضوعات مختارة في نظم المعلومات الجغرافية والاستشعار عن بعد	Selected Topics in GIS and Remote Sensing	3
GIS 530	مشروع الدبلوم	Diploma Project	6

دبلوم تكنولوجيا المعلومات

(30 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
IT 511	الوسائط المتعددة	Multimedia Systems	3
IT 512	شبكات الحاسب	Computer Networks	3
IT 513	معالجة الإشارات الرقمية	Digital Signal Processing	3
IT 514	النظم المدمجة	Embedded System	3
IT 515	معالجة الصورة	Image Processing	3
IT 516	الرسم بالحاسب	Computer Graphics	3
IT 517	برمجة الشبكات	Network Programming	3
IT 518	موضوعات مختارة في تكنولوجيا المعلومات	Selected Topics in Information Technology	3
IT 530	مشروع الدبلوم	Diploma Project	6

دبلوم بحوث العمليات ودعم القرار

(30 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
DS 511	تقنيات محاكاة الكمبيوتر	Computer Simulation Techniques	3
DS 512	تقنيات الجدولة	Scheduling Techniques	3
DS 513	نظرية القرارات والمباريات	Decision and Game Theory	3
DS 514	الحسابات الذكية في بحوث العمليات	Computational intelligence in Operations Research	3
DS 515	البرمجة الغير خطيه والديناميكية	Non-linear and Dynamic Programming	3
DS 516	اساليب نظم دعم القرار	Techniques for Decision support systems	3
DS 517	الأمثلة الخطية وغير الخطية	Linear and Nonlinear Optimization	3
DS 518	موضوعات مختارة فى بحوث العمليات ودعم القرار	Selected Topics in Operations Research and Decision Support	3
DS 530	مشروع الدبلوم	Diploma Project	6

ملحق رقم (2)
المقررات الدراسية لمرحلة
ماجستير العلوم

أولاً: خريطة المقررات الدراسية لمرحلة ماجستير العلوم

ثانياً: المقررات الإجبارية على مستوى الكلية

المقررات الإجبارية (6 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
GN 600	منهجية البحث والكتابة العلمية	Research Methodology and Scientific Writing	3
GN 601	حل المشكلات: أساليب البرمجة والمفاهيم المستقبلية	Problem Solving: Methods, Programming and Future Concepts	3
إجمالي			6

ثالثاً: المقررات الإجبارية والاختيارية على مستوى التخصص

مقررات الماجستير في تخصص علوم الحاسب

المقررات الإجبارية (6 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
CS 600	الطرق الصورية ونظرية الحسابات المتقدمة	Advanced Formal Methods and Theory of Computation	3
CS 601	الرياضيات والخوارزميات المتقدمة	Advanced Mathematics and Algorithms	3
	إجمالي		6

المقررات الاختيارية (12 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
CS 611	تحليل الخوارزميات المتقدم	Advanced Analysis of Algorithms	3
CS 612	الذكاء الاصطناعي المتقدم	Advanced Artificial Intelligence	3
CS 613	التشفير وحماية الحاسب	Cryptography and Computer Security	3
CS 614	نظم التشغيل المتقدم	Advanced Operating Systems	3
CS 615	تصميم المترجمات المتقدم	Advanced Compiler Design	3
CS 616	الخوارزميات التطورية	Evolutionary Algorithms	3
CS 617	تعلم الآلة	Machine Learning	3
CS 618	تصميم لغات البرمجة	Programming Language Design	3
CS 619	المعلوماتية الحيوية المتقدمة	Advanced Bioinformatics	3
CS 620	الحسابات العصبية	Neural Computation	3
CS 621	الحوسبة عالية الأداء	High Performance Computing	3
CS 622	معالجة اللغات الطبيعية	Natural Language Processing	3
CS 623	تصميم تفاعل الانسان مع الحاسب	Computer Human Interaction Design	3
CS 624	تعدين الويب	Web Mining	3
CS 625	الحلقات البحثية في علوم الحاسب - I	Research Seminars in Computer Science - I	3
CS 626	موضوعات متقدمة في علوم الحاسب - I	Advanced Topics in Computer Science - I	3

مقررات الماجستير في تخصص نظم المعلومات

المقررات الإجبارية (6 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
IS 600	نظم قواعد البيانات المتقدمة	Advanced Database Systems	3
IS 601	هندسة البرمجيات المتقدمة	Advanced Software Engineering	3
	إجمالي		6

المقررات الاختيارية (12 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
IS 611	تصميم وهيكلة البرمجيات	Software Architecture and Design	3
IS 612	القيادة وريادة الاعمال والتعلم	Leadership, Entrepreneurship and Learning	3
IS 613	حلول نظام العمل الإلكتروني	E-Business System Solution	3
IS 614	طريقة الاجايل في تطوير البرمجيات	Agile Software Development	3
IS 615	إدارة عمليات الأعمال	Business Process Management	3
IS 616	تنفيذ وتصميم تطبيقات قواعد البيانات	Database Application Design and Implementation	3
IS 617	تشفير وأمان قواعد البيانات	Database Security and Cryptography	3
IS 618	تحليل البيانات لنظم المعلومات	Data Analytics for Information Systems	3
IS 619	هندسة المعرفة	Knowledge Engineering	3
IS 620	إدارة ضمان المعلومات	Management of Information Assurance	3
IS 621	أمان نظم المعلومات	Information Systems Security	3
IS 622	الاعتبارات الأخلاقية والقانونية والاجتماعية في نظم المعلومات	Ethical, Legal and Social Issues in Information Systems	3
IS 623	استراتيجية وحوكمة نظم المعلومات	Information Systems Strategy and Governance	3
IS 624	معمارية المعلومات	Information Architecture	3
IS 625	الحلقات البحثية فى نظم المعلومات - I	Research Seminars in Information Systems - I	3
IS 626	موضوعات متقدمة في نظم المعلومات - I	Advanced Topics in Information Systems - I	3

مقررات الماجستير في تخصص نظم المعلومات الجغرافية والاستشعار عن بعد

المقررات الإجبارية (6 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
GIS 600	نظم المعلومات المكانية	Spatial Information Systems	3
GIS 601	الاستشعار عن بعد لنظم المعلومات الجغرافية	Remote Sensing for GIS	3
	إجمالي		6

المقررات الاختيارية (12 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
GIS 611	تصميم وتنظيم وإدارة قواعد البيانات المكانية	Spatial Databases Design, Management and Administration	3
GIS 612	التحليل والنمذجة المكانية المتقدمة	Advanced Spatial Analysis and Modeling	3
GIS 613	برمجة وتخصيص نظم المعلومات الجغرافية المتقدمة	Advanced GIS Programming and Customization	3
GIS 614	الكارتوجرافيا الرقمية	Digital Cartography	3
GIS 615	مصادر جمع البيانات المكانية	Spatial Data Sources and Acquisition	3
GIS 616	البنية التحتية لنظم المعلومات الجغرافية الموزعة والمفتوحة	Open and Distributed GIS Infrastructures	3
GIS 617	الاحصاء المكاني	Spatial Statistics	3
GIS 618	نظم دعم القرارات المكانية	Spatial Decision Support Systems	3
GIS 619	تنظيم وإدارة مشروعات نظم المعلومات الجغرافية	GIS Organization and Project Management	3
GIS 620	نظم المعلومات الجغرافية علي الويب والمحمول	Web and Mobile GIS	3
GIS 621	المساحة التصويرية الرقمية	Digital Photogrametry	3
GIS 622	تحليل ورسم خرائط الجريمة	Crime Mapping and Analysis	3
GIS 623	تطبيقات الاستشعار عن بعد	Applied Remote Sensing	3
GIS 624	نظم المعلومات الجغرافية الطبية	Medical GIS	3
GIS 625	الحلقات البحثية في نظم المعلومات الجغرافية - I	Research Seminars in GIS - I	3
GIS 626	موضوعات متقدمة في نظم المعلومات الجغرافية - I	Advanced Topics in GIS - I	3
GIS 627	الحلقات البحثية في الاستشعار عن بعد - I	Research Seminars in Remote Sensing - I	3
GIS 628	موضوعات متقدمة في الاستشعار عن بعد - I	Advanced Topics in Remote Sensing - I	3

مقررات الماجستير في تخصص تكنولوجيا المعلومات

المقررات الإجبارية (6 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
IT 600	أساسيات الشبكات الحديثة	Foundations of Modern Networking	3
IT 601	معالجة الإشارات المتقدمة	Advanced Signal Processing	3
	إجمالي		6

المقررات الاختيارية (12 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
IT 611	معالجة الصور المتقدمة	Advanced Image Processing	3
IT 612	مواجهات الحاسب المتقدمة	Advanced Computer Interfaces	3
IT 613	بروتوكولات امان الشبكة	Network Security Protocols	3
IT 614	خوارزميات الشبكات وتقنيات المحاكاة	Network Algorithms and Simulation Techniques	3
IT 615	تقنيات ضغط البيانات	Data Compression Techniques	3
IT 616	برمجة الشبكات المتقدمة	Advanced Network Programming	3
IT 617	نظم الزمن الحقيقي	Real Time Systems	3
IT 618	نظرية الترميز	Coding Theory	3
IT 619	التعرف الآلي على الكلام	Automatic Speech Recognition	3
IT 620	الشبكات اللاسلكية والمتحركة	Wireless and Mobile Networks	3
IT 621	النظم المدمجة المتقدمة	Advanced Embedded System	3
IT 622	الرسم بالحاسب المتقدم	Advanced Computer Graphics	3
IT 623	التشفير	Cryptography	3
IT 624	هيكل وخدمات الحوسبة السحابية	Cloud Computing Infrastructure and Services	3
IT 625	التصوير الطبى	Medical Imaging	3
IT 626	الواقع الافتراضي	Virtual Reality	3
IT 627	الحلقات البحثية فى تكنولوجيا المعلومات - I	Research Seminars in Information Technology - I	3
IT 628	موضوعات متقدمة فى تكنولوجيا المعلومات - I	Advanced Topics in Information Technology - I	3

مقررات الماجستير في تخصص بحوث العمليات ودعم القرار

المقررات الإجبارية (6 ساعات معتمدة)

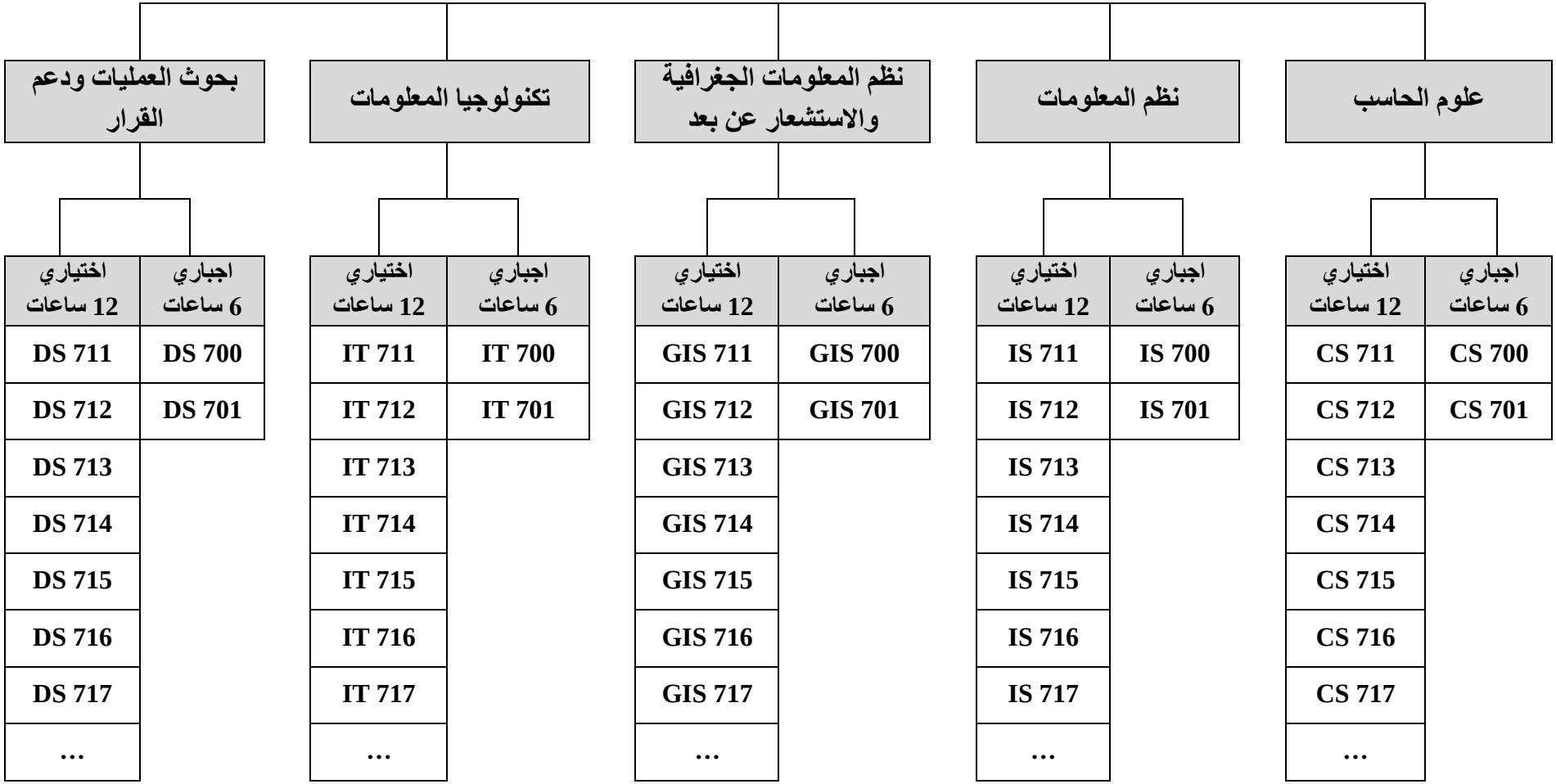
كود المقرر	اسم المقرر		عدد الساعات المعتمدة
DS 600	تطبيقات الذكاء الحسابي في بحوث العمليات ودعم القرار	Applied Computational intelligence in operations research and Decision Support	3
DS 601	تحليل ونظرية القرار	Decision Theory and Analysis	3
	إجمالي		6

المقررات الاختيارية (12 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
DS 611	الإدارة الاستراتيجية والمخاطر وإدارة الأزمات	Strategic, Risk, and Crisis Management	3
DS 612	تطبيقات إدارة المشروعات	Applied Project Management	3
DS 613	أمثليه متقدمة	Advanced Optimization	3
DS 614	البرمجة العشوائية المتقدمة	Advanced Stochastic Programming	3
DS 615	نظريات القرارات والمباريات متقدمة	Advanced Decision and Game Theory	3
DS 616	تطبيقات متقدمة في النمذجة والمحاكاة	Advanced Application in Modeling and Simulation	3
DS 617	إدارة وهندسة علوم الخدمة	Service Science, Management and Engineering	3
DS 618	ادارة الجودة	Quality Management	3
DS 619	اتخاذ القرارات التنفيذية	Executive Decision Making	3
DS 620	الاستدامة في ادارة سلسلة التوريد	Sustainability in Supply Chain Management	3
DS 621	الحلقات البحثية فى بحوث العمليات - I	Research Seminars in Operations Research - I	3
DS 622	موضوعات متقدمة فى بحوث العمليات - I	Advanced Topics in Operations Research - I	3
DS 623	الحلقات البحثية فى دعم القرار - I	Research Seminars in Decision Support - I	3
DS 624	موضوعات متقدمة فى دعم القرار - I	Advanced Topics in Decision Support - I	3

ملحق رقم (3)
المقررات الدراسية لمرحلة
دكتوراه الفلسفة

اولاً: خريطة المقررات الدراسية لمرحلة الدكتوراه



ثانياً: المقررات الإجبارية والاختيارية على مستوى التخصص

مقررات الدكتوراه في تخصص علوم الحاسب

المقررات الإجبارية (6 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
CS 700	الاتجاهات الحديثة في الطرق الصورية ونظرية الحسابات	New Directions in Formal Methods and Theory of Computation	3
CS 701	الاتجاهات الحديثة في الرياضيات والخوارزميات المتقدمة	New Directions in Advanced Mathematics and Algorithms	3
	إجمالي		6

المقررات الاختيارية (12 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
CS 711	نظرية التعقيد المتقدمة	Advanced Complexity Theory	3
CS 712	معالجة اللغات الطبيعية متقدم	Advanced Natural Language Processing	3
CS 713	تصميم التفاعل الانساني مع الحاسب الالي المتقدم	Advanced Computer Human Interaction Design	3
CS 714	تصميم وتحليل الحساب الموازي المتقدم	Advanced Parallel Algorithm Design and Analysis	3
CS 715	الحوسبة المرنة متقدم	Advanced Soft Computing	3
CS 716	الاتجاهات الحديثة في المعلوماتية الحيوية	New Directions in Bioinformatics	3
CS 717	نظم الوكلاء المتعددة متقدم	Advanced Multi-Agents Systems	3
CS 718	الحسابات ذات السرعة الفائقة	Advanced High-Performance Computing	3
CS 719	الاتجاهات الحديثة في الذكاء الاصطناعي	New Directions in Artificial Intelligence	3
CS 720	الاتجاهات الحديثة في تصميم المترجمات	New Directions in Compiler Design	3
CS 721	الحلقات البحثية في علوم الحاسب - II	Research Seminars in Computer Science - II	3
CS 722	موضوعات متقدمة في علوم الحاسب - II	Advanced Topics in Computer Science - II	3

مقررات الدكتوراه في تخصص نظم المعلومات

المقررات الإجبارية (6 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
IS 700	الأساليب الكمية فى نظم المعلومات	Quantitative Methods in Information Systems	3
IS 701	نظم التفكير والنمذجة لأنظمة المعلومات	Systems Thinking and Modeling for Information Systems	3
	إجمالي		6

المقررات الاختيارية (12 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
IS 711	هيكلة المؤسسات	Enterprise Architecture	3
IS 712	قيادة التغيير	Leading Change	3
IS 713	الاتجاهات الحديثة في هندسة البرمجيات	New Directions in Software Engineering	3
IS 714	تحليل متطلبات البرمجيات	Software Requirements Analysis	3
IS 715	نظم المعلومات الصورية	Formal Information Systems	3
IS 716	تنظيم وإدارة قواعد البيانات المتقدمة	Advanced Database Management and Administration	3
IS 717	التخزين والتنقيب عن البيانات	Data Warehousing and Mining	3
IS 718	نظم المعلومات والأمن عبر الإنترنت	Information Systems and Cyber Security	3
IS 719	تحليلات البيانات الكبيرة وعلوم البيانات	Big Data Analytics and Data Science	3
IS 720	تدقيق نظم المعلومات	Information Systems Auditing	3
IS 721	ضمان جودة نظم المعلومات	Information Systems Quality Assurance	3
IS 722	نمذجة عمليات الأعمال ونظم التدفق	Business Process Modeling and Workflow Systems	3
IS 723	تكنولوجيا وتطبيقات الأعمال الإلكترونية	E-business Technologies and Applications	3
IS 724	استرجاع المعلومات المتقدمة	Advanced Information Retrieval	3
IS 725	الحلقات البحثية فى نظم المعلومات - II	Research Seminars in Information Systems - II	3
IS 726	موضوعات متقدمة في نظم المعلومات - II	Advanced Topics in Information Systems - II	3

مقررات الدكتوراه في تخصص نظم المعلومات الجغرافية والاستشعار عن بعد

المقررات الإجبارية (6 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
GIS 700	نظريات ونماذج وقضايا نظم المعلومات الجغرافية	GIS Theories, Models and Issues	3
GIS 701	تصميم وتنظيم وإدارة قواعد البيانات المكانية المتقدمة	Advanced Spatial Database Design, Management and Administration	3
	إجمالي		6

المقررات الاختيارية (12 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
GIS 711	استخلاص البيانات المكانية	Spatial Data Mining	3
GIS 712	الادراك المكاني والحوسبة	Spatial Cognition and Computing	3
GIS 713	نمذجة البيانات المكانية الزمنية	Spatio-Temporal Data Modeling	3
GIS 714	التحليل والنمذجة للبيانات الشبكية	Raster Analysis and Modeling	3
GIS 715	نمذجة الشبكات باستخدام نظم المعلومات الجغرافية	Network Modeling Using GIS	3
GIS 716	الحسابات الجغرافية	Geocomputation	3
GIS 717	البيانات المكانية الضخمة	Spatial Big Data	3
GIS 718	نظم المعلومات الجغرافية والأمن عبر الإنترنت	GIS and Cyber Security	3
GIS 719	الاستشعار عن بعد متقدم	Advanced Digital Remote Sensing	3
GIS 720	نظم المعلومات الجغرافية السحابية	Cloud GIS	3
GIS 721	تكامل البيانات المكانية	Spatial Data Integration	3
GIS 722	الاستشعار عن بعد الراداري	Radar Remote Sensing	3
GIS 723	الاستشعار عن بعد باستخدام الميكروويف	Microwave Remote Sensing	3
GIS 724	تحليل بيانات الاستشعار عن بعد	Remote Sensing Data Analysis	3
GIS 725	الحلقات البحثية فى نظم المعلومات الجغرافية - II	Research Seminars in GIS - II	3
GIS 726	موضوعات متقدمة في نظم المعلومات الجغرافية - II	Advanced Topics in GIS - II	3
GIS 727	الحلقات البحثية فى الاستشعار عن بعد - II	Research Seminars in Remote Sensing - II	3
GIS 728	موضوعات متقدمة في الاستشعار عن بعد - II	Advanced Topics in Remote Sensing – II	3

مقررات الدكتوراه في تخصص تكنولوجيا المعلومات

المقررات الإجبارية (6 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
IT 700	شبكات الحاسب المتقدمة	Advanced Computer Networks	3
IT 701	الاتجاهات الحديثة في معالجة الاشارات	New Directions in Signal Processing	3
	إجمالي		6

المقررات الاختيارية (12 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
IT 711	الاتجاهات الحديثة في معالجة الصور	New Directions in Image Processing	3
IT 712	الاتجاهات الحديثة في النظم المدمجة	New Directions in Embedded Systems	3
IT 713	أمن الشبكات المتقدم	Advanced Network Security	3
IT 714	موضوعات متقدمة في الإنسان الآلي والرؤية بالحاسب	Advanced Topics in Robotics and Computer Vision	3
IT 715	نظم الوسائط المتعددة المتقدمة	Advanced Multimedia Systems	3
IT 716	تصميم نظام شبكة آمنة	Secure Network System Design	3
IT 717	معالجة الكلام المتقدمة	Advanced Speech Processing	3
IT 718	معمارية الحاسب الحديث	Modern Computer Architecture	3
IT 719	شبكات المجسات اللاسلكية	Wireless Sensor Networks	3
IT 720	التعرف على الأنماط المتقدمة	Advanced Pattern Recognition	3
IT 721	الأمن عبر الإنترنت: المفهوم والنظرية والتطبيق	Cyber Security: Concept, Theory and Practice	3
IT 722	إنترنت الأشياء	Internet of Things	3
IT 723	الحلقات البحثية فى تكنولوجيا المعلومات - II	Research Seminars in Information Technology - II	3
IT 724	موضوعات متقدمة فى تكنولوجيا المعلومات - II	Advanced Topics in Information Technology - II	3

مقررات الدكتوراه في تخصص بحوث العمليات ودعم القرار

المقررات الإجبارية (6 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
DS 700	الذكاء الحسابي المتقدم في بحوث العمليات ودعم القرار	Advanced Computational intelligence in operations research and Decision Support	3
DS 701	منهجيات دعم القرار المتقدمة	Advanced Decision Support Methodologies	3
	إجمالي		6

المقررات الاختيارية (12 ساعات معتمدة)

كود المقرر	اسم المقرر		عدد الساعات المعتمدة
DS 711	تطبيقات بحوث العمليات ودعم القرار متقدمة	Applications of Advanced Operations Research and Decision Support	3
DS 712	إدارة التخطيط والاستراتيجيات	Strategies and Planning Management	3
DS 713	تقنيات التنبؤ المتقدمة	Advanced Forecasting Techniques	3
DS 714	تقنيات الجدولة المتقدمة	Advanced Scheduling Techniques	3
DS 715	تقنيات محاكاة الحاسب المتقدمة	Advanced Computer Simulation Techniques	3
DS 716	موضوعات متقدمة في تحليل القرار	Advanced Topics in Decision Analysis	3
DS 717	نماذج بحوث العمليات ودعم القرار المتقدمة	Advanced Models of Operations Research and Decision Support	3
DS 718	الحلقات البحثية فى بحوث العمليات - II	Research Seminars in Operations Research - II	3
DS 719	موضوعات متقدمة فى بحوث العمليات - II	Advanced Topics in Operations Research - II	3
DS 720	الحلقات البحثية فى دعم القرار - II	Research Seminars in Decision Support - II	3
DS 721	موضوعات متقدمة فى دعم القرار - II	Advanced Topics in Decision Support - II	3

خامساً:
المحتوى العلمي للمقررات الدراسية

المحتوى العلمي للمقررات العامة

توصيف مقررات الماجستير

GN600: Research Methodology and Scientific Writing

منهجية البحث والكتابة العلمية

This course introduces the principles and mechanics of technical and scientific academic writing skills, philosophy of science, research methods and scientific methodologies for persons studying or working technologies or sciences. Students will learn research essentials and specific communications skills associated with reporting technical information and will write a series of papers ranging from process description and feasibility reports to a research project, to be reported orally. The academic writing class is an intensive analysis of the principles of excellent academic writing for scientists preparing a range of texts including research papers, conference proposals, conference posters, book chapters, technical reports, dissertations.

GN601: Problem Solving: Methods, Programming and Future Concepts

حل المشكلات: أساليب البرمجة والمفاهيم المستقبلية

This course offers a comprehensive foundation in the science of programming. It gives the student a strong basis for developing the computer applications of today and tomorrow and for conducting innovative research and promoting development. The core of the course covers three main areas of computing science: Algorithms including artificial intelligence, machine learning and optimization; Logic including applications in hardware and software verification; Programming languages with underlying principles, implementation techniques and advanced programming techniques.

المحتوى العلمي لمقررات قسم علوم الحاسب

توصيف مقررات دبلوم الدراسات العليا في تخصص علوم الحاسب

CS511: Compiler Design

تصميم مترجمات

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

CS512: Bioinformatics

المعلوماتية الحيوية

The course introduces the role of computer science in biology and presents algorithms and techniques used in bio-sequence analysis, gene data analysis, protein structures, and protein networks and their analysis.

CS513: Operating Systems

نظم التشغيل

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

CS514: Artificial Intelligence

الذكاء الاصطناعي

This is an introductory AI course. Topics will include Artificial and human intelligence، overview of Artificial Intelligence, basic problem-solving strategies, heuristic search, problem reduction and AND/OR graphs, domains of AI- symbolic processing: semantic nets, modeling model based reasoning, frames. Knowledge Representation, representing knowledge with If- Then rules. Inference Engines, inference techniques: implication, forward and backward chaining, inference nets, predicate logic, quantifiers, tautology, resolution, and unification. rule based systems: inference engine, production systems, problem solving, planning، decomposition, and basic search

techniques. AI languages: symbolic and coupled processing prolog: objects and relations, compound goals, backtracking, search mechanism, dynamic databases, lisp, program structure and operations, functions, unification, memory models. Fields of AI: heuristics and game plying, automated reasoning, problem solving، computational linguistics and natural language processing, computer vision, intelligent agents، robotics AI based computer systems: sequential and parallel inference machines, relation between AI and artificial neural nets, fuzzy systems.

CS515: Computer Systems Performance

أداء نظم الحاسب

The course focuses on principles of the quantitative evaluation techniques for computer system hardware and software, emphasizing the establishment and analysis of performance criteria. Deterministic and stochastic methods will be discussed. The goals of the computer systems performance analyst, the fundamental techniques used to study the performance of computer systems, and the advantages and disadvantages of the different techniques. You also will be introduced to the concept of performance debugging.

CS516: Complexity Theory

نظرية التعقيد

Provides an introduction to some of the central ideas of theoretical computer science, including circuits and decision trees, finite automata, Turing machines and computability, efficient algorithms and reducibility, the P versus NP problem, NP-completeness, the power of randomness, cryptography and one-way functions, computational learning theory, and quantum computing. Examines the classes of problems that can and cannot be solved in various computational models.

CS517: Parallel Algorithm Design and Analysis

تصميم وتحليل الخوارزميات المتوازية

The course provides a modern introduction to design, analysis and implementation of sequential and parallel algorithms. In particular, the course is based on a pragmatic approach to parallel programming of message-passing algorithms

CS518: Selected Topics in Computer Science

موضوعات مختارة في علوم الحاسب

Selected Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of computer science. Topics chosen for study will be by arrangement with the department.

CS530: Diploma Project

المشروع الدبلوم

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.

توصيف مقررات الماجستير في تخصص علوم الحاسب

CS600: Advanced Formal Methods and Theory of Computation

الطرق الصورية ونظرية الحسابات المتقدمة

This course emphasizes theoretical models of computation and their analysis. The aim of analysis is to identify and prove the capabilities and limitations of particular models of computation. It is shown that there are problems that are unsolvable, that is, there are questions that cannot beans wired by any model of computation. Limits on computation in the context of resource bounds are also investigated. Techniques(reductions) are developed to show that one model of computation is equivalent in power to another or that it is different in power from another. Models of computation that are covered include finite automata, pushdown automata, and Turing machines. Some complexity theory is covered as well.

CS601: Advanced Mathematics and Algorithms

الرياضيات والخوارزميات المتقدمة

This course enables students to strengthen and increase the understanding of mathematics with special emphasis on computer science applications. Topics include propositional Logic, predicate Logic and quantification, methods of proof, sets and functions, arithmetic algorithms, growth of functions, computational complexity of algorithms, integer properties and matrices, mathematical induction, recursion, sequences and summations, program correctness, graphs and its applications, trees and its applications, languages and grammars, finite-state machines, automata and language recognition and Turing machines

CS611: Advanced Analysis of Algorithms

تحليل الخوارزميات المتقدم

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

CS612: Advanced Artificial Intelligence

الذكاء الاصطناعي المتقدم

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

CS613: Cryptography and Computer Security

التشفير وحماية الحاسب

The class will focus on the study of secure multiparty computation. Informally, these are general protocols among two or more parties, where all parties want to maintain the privacy of their inputs

and prevent other parties from disrupting the correct execution of the computation (for example, think of voting protocols, auctions, computing the average salary of the participants, playing black jack, etc.). Indeed, secure computation can be viewed as encompassing, in some sense, every other cryptographic task as a special case, and general plausibility results (protocols for secure computation of any functionality) are among the most important results in cryptography.

CS614: Advanced Operating Systems

نظم التشغيل المتقدم

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

CS615: Advanced Compiler Design

تصميم المترجمات المتقدم

Built upon basic compiler knowledge, this course covers advanced materials on compiler principles and techniques, including data-flow analysis, basic compiler optimizations, SSA, pointer analysis, localization and parallelization optimization, and recent progresses on program analysis & optimization. Students are required to work on a project to implement a new analysis or optimization, or use materials learned in class to solve a practical problem. A prerequisite to the course is to undergraduate course on compiler principles or techniques.

CS616: Evolutionary Algorithms

الخوارزميات التطورية

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

CS617: Machine Learning

تعلم الآلة

Machine Learning is concerned with computer programs that automatically improve their performance through experience. Machine Learning methods have been applied to problems such as learning to drive an autonomous vehicle, learning to recognize human speech, and learning strategies for game playing. This course covers the primary approaches to machine learning from a variety of fields, including inductive inference of decision trees, neural network learning, statistical

learning methods, genetic algorithms, Bayesian methods, explanation-based learning, and reinforcement learning.

CS618: Programming Language Design

تصميم لغات البرمجة

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

CS619: Advanced Bioinformatics

المعلوماتية الحيوية المتقدمة

This course covers the algorithmic and machine learning foundations of computational biology combining theory with practice. It covers both foundational topics in computational biology, and current research frontiers. It also studies fundamental techniques, recent advances in the field, and work directly with current large-scale biological datasets.

CS620: Neural Computation

الحسابات العصبية

Neural Computation is an area of interdisciplinary study that seeks to understand how the brain computes to achieve natural intelligence. It seeks to understand the computational principles and mechanisms of intelligent behaviors and mental abilities – such as perception, language, motor control, and learning – by building artificial systems and computational models with the same capabilities. This course explores how neurons encode and process information, adapt and learn, communicate and compute at the individual level as well as at the levels of networks and systems. It will cover basic concepts in computational and neuronal modeling, information theory and coding, neural networks and learning, neural data analysis and decoding, signal processing and system analysis, statistical learning and probabilistic inference. Concrete examples will be drawn from the visual system and the motor system, including brain computer interface and neural decoding. Students will learn to perform quantitative analysis and perform computational experiments using MATLAB. No prior background in biology is assumed.

CS621: High Performance Computing

الحوسبة عالية الأداء

This course will introduce students to the design, analysis, and implementation, of high performance computational science and engineering applications. The course focuses on advanced computer architectures, parallel algorithms, parallel languages, and performance-oriented computing. Students will develop knowledge and skills concerning:

CS622: Natural Language Processing

معالجة اللغات الطبيعية

Natural Language Processing addresses fundamental questions at the intersection of human languages and computer science. How can computers acquire, comprehend and produce English?

How can computational methods give us insight into observed human language phenomena? In this course, you will learn how computers can do useful things with human languages, such as translate from French into English, filter junk email, extract social networks from the web, and find the main topics in the day's news. This course covers, how computational methods can help linguists explain language phenomena, including automatic discovery of different word senses and phrase structure.

CS623: Computer Human Interaction Design

تصميم التفاعل الأنسان مع الحاسب الآلي

The course is intended to introduce the student to the basic concepts of human-computer interaction. It will cover the basic theory and methods that exist in the field. The course will unfold by examining design and evaluation. Case studies are used throughout the readings to exemplify the methods presented and to lend a context to the issues discussed. The students will gain principles and skills for designing and evaluating interactive systems. Among the topics studied are the design and evaluation of effective user interaction designs, including principles and guidelines for designing interactive systems. Additionally, much emphasis is given to the development process for user interaction designs as an integral, but different, part of interactive software development. User interaction development activities include requirements and task analysis, usability specifications, design, prototyping, and evaluation. It is a goal of this course to help students realize that user interface development is an ongoing process throughout the full product life cycle and developing the human-computer interface is not something to be done at the last minute, when the "rest of the system" is finished.

CS624: Web Mining

تعدين الويب

This course introduces techniques of mining information from the web. It includes studying data sources on the web, and personalization techniques. It also covers basic and advanced techniques for text-based information systems: efficient text indexing; Boolean and vector space retrieval models. It includes web search strategies and web metadata; text/web clustering, classification and text mining. Research directions in web mining will be also discussed.

CS625: Research Seminars in Computer Science – I

الحلقات البحثية في علوم الحاسب – I

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. Students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

CS626: Advanced Topics in Computer Science – I

موضوعات متقدمة في علوم الحاسب – I

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of computer science. Topics chosen for study will be by arrangement with the department.

توصيف مقررات الدكتوراه فى تخصص علوم الحاسب

CS700: New Directions in Formal Methods and Theory of Computation

الاتجاهات الحديثة في الطرق الصورية ونظرية الحسابات

The course covers advanced topics including: non-regular languages, multi-tape Turing machines, decidability, the halting problem, reducibility, incompressible strings and randomness, winning strategies for games, and advanced topics in complexity theory.

CS701: New Directions in Mathematics and Algorithms

الاتجاهات الحديثة في الرياضيات والخوارزميات

The course covers advanced mathematics including: iterative solutions of nonlinear system of equations, methods for solving linear systems of equations, and analysis of computational errors. Curve fitting using least square method will also be covered. The course also covers advanced topics in algorithms including: NP-hard, NP-complete problems and Instances, randomization, approximation, and semi-definite programming to solve them. Bloom filter, stream programming, game theoretic techniques, geometric algorithms, and approximate counting may also be considered.

CS711: Advanced Complexity Theory

نظرية التعقيد المتقدمة

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

CS712: Advanced Natural Language Processing

معالجة اللغات الطبيعية متقدم

This course presents the analytic and quantitative methods used in natural language processing and understanding. It reviews the traditional analytic techniques for processing natural languages and discusses advanced algorithms for parsing and discussing the shortcomings of the analytic techniques. The course will also deal with the statistical language processing techniques at the level of morphology, syntax, and semantic, and its relation with current research in other linguistic techniques such as statistical machine translation. The problems of statistical processing techniques will also be discussed.

CS713: Advanced Computer Human Interaction Design

تصميم التفاعل الإنساني مع الحاسب الآلي المتقدم

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

CS714: Advanced Parallel Algorithm Design and Analysis

تصميم وتحليل الحساب الموازي المتقدم

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

CS715: Advanced Soft Computing

الحوسبة المرنة المتقدمة

The course covers the following. Type-2 Fuzzy sets. Embedded fuzzy sets. Rough sets. Rough-Neural computing. Rough-fuzzy hybridization. Granular Computing. Flexible neuro-fuzzy systems. Near sets. Grammatical evolution. Immune systems. Mathematics of soft computing. Advanced applications of soft computing.

CS716: New Directions in Bioinformatics

الاتجاهات الحديثة في المعلوماتية الحيوية

The course covers: molecular biology; problems and challenges in bioinformatics; sequence analysis; prediction of protein structure, interaction and localization; gene expression analysis; pathway analysis; classification and dimensionality reduction of gene expression data, classification of cancer using diagnosis data, HMMs applications in bioinformatics.

CS717: Advanced Multi-Agents Systems

نظم الوكلاء المتعددة متقدم

The course covers advanced topics in multi-agent systems. It includes abstract architectures for intelligent agents, concrete architectures for intelligent agents, agent-programming languages of multi-agents, multi-agent environments, agent's communications, agent interaction protocols, societies of agents, and search algorithms for agents, distributed problem solving and planning, learning in multi-agent systems.

CS718: Advanced High-Performance Computing

الحسابات ذات السرعة الفائقة

This course will introduce students to the design, analysis, and implementation, of high-performance computational science and engineering applications. The course focuses on advanced computer architectures, parallel algorithms, parallel languages, and performance-oriented computing. Students will develop knowledge and skills concerning:

- the key factors affecting performance of computational science and engineering (CSE) applications, and
- mapping of applications to high-performance computing systems, and
- hardware/software co-design for achieving performance on real-world applications.

CS719: New Directions in Artificial Intelligence

الاتجاهات الحديثة في الذكاء الاصطناعي

This course will review basic knowledge modeling and representation and search techniques, and then will introduce advanced topics in artificial intelligence, including knowledge discovery;

semantic web technologies; ontology engineering, handling uncertainty, and distributed artificial intelligence. Areas of application can be also investigated such as text mining, social networks, etc.

CS720: New Directions in Compiler Design

الاتجاهات الحديثة في تصميم المترجمات

Study of the techniques for translating conventional programming language source into executable machine codes. Topics include: lexical analysis, syntactic analysis and parsing, static and runtime storage management, and code generation.

CS721: Research Seminars in Computer Science - II

الحلقات البحثية في علوم الحاسب - II

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

CS722: Advanced Topics in Computer Science - II

موضوعات متقدمة في علوم الحاسب - II

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of computer science. Topics chosen for study will be by arrangement with the department.

المحتوى العلمي لمقررات قسم نظم المعلومات

توصيف مقررات دبلوم الدراسات العليا في تخصص نظم المعلومات

IS511: Data Mining for Business Analytics

التنقيب عن البيانات لتحليل الاعمال

Students will examine how data analytics technologies are used to improve decision-making. Students will study the fundamental principles and techniques of mining data, and we will examine real-world examples and cases to place data-mining techniques in context, to improve your data-analytic thinking, and to illustrate that proper application is as much an art as it is a science. In addition, we will work hands-on with data mining software. After taking this course you should: (1) Approach business problems data-analytically. Think carefully and systematically about whether and how data can improve business performance, to make better-informed decisions. (2) Be able to interact competently on business analytics topics. Know the fundamental principles of data science that are the basis for analytics processes, algorithms, and systems. Understand these well enough to work on data science projects and interact with everyone involved. Envision new opportunities. (3) Have had hands-on experience mining data. Be prepared to follow up on ideas or opportunities that present themselves, e.g., by performing pilot studies.

IS512: Business Intelligence

ذكاء الأعمال

This course covers the key concepts and applications of business intelligence (BI). Business and technology drivers are explained in order to provide students with the proper context in understanding how BI can provide business value and help companies use technology effectively in managing their businesses. An overview that includes the uses and users of business intelligence, as well as the type of applications and tools that may be deployed, help students better understand the business intelligence project lifecycle. Additional topics that complement the understanding and application of business intelligence such as data warehousing (DW) are introduced. Using practical examples and hands-on exercises with real life applications present an opportunity to effectively illustrate technical concepts and techniques used in BI. By providing an opportunity to gain both business and technical perspective, students are better equipped to appreciate in ways information technologies can be implemented to drive business results.

IS513: Database Management and Administration

تنظيم وإدارة قواعد البيانات

This course will cover disk storage, basic-file structure, hashing techniques, indexing structures for files, transaction processing concepts and theory for databases with main schedules for recoverability, schedules for serializability, and transaction support in SQL. Concurrency control techniques will be also covered such as timestamp ordering, multi-version concurrency control techniques, validation concurrency control techniques, granularity of data items and multiple granularity locking. The course will also cover database recovery techniques such as NO-UNDO/REDO recovery, recovery techniques based on immediate update, shadow paging, and ARIES recovery algorithm.

IS514: Principles of Information Assurance, Security and Privacy

مبادئ سرية وأمان وضمان المعلومات

This course is a survey of the fundamental elements of computer security and information assurance. Topics may include confidentiality, integrity, and availability; security policies; authentication; access control; risk management; threat and vulnerability assessment; common attack/defense methods; ethical issues. Course topics include leading practices for information security and assurance governance and risk management; network architecture and design of systems to maximize assurance; business continuity, disaster recovery planning, resiliency; data privacy risks and laws; understanding legal, investigation, information-security incident response and management processes; and developing secure application software.

IS515: Cloud Computing and Data Technologies

الحوسبة السحابية وتقنيات البيانات

This course will cover data technologies for cloud computing infrastructure. The course includes: cloud computing layers and cross layer functions, basic infrastructure and reference model of cloud computing for organizations. The course will also cover: deployment models and solutions for building a cloud infrastructure, business continuity and cloud service availability, fault tolerance mechanisms for cloud infrastructure, data protection solutions, key design strategies for cloud application resiliency.

IS516: E-Business System Strategy

استراتيجية نظم الأعمال الإلكترونية

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

IS517: Information Systems Analysis and Design

تحليل وتصميم نظم المعلومات

The course includes a short introduction to systems analysis and design. In titles it contains an introduction to systems development and the organizational and business context of systems development, approaches to systems development and project management methodologies, models, tools and techniques applied to information systems, systems analysis activities through how to define, prioritize, and evaluate requirements of an information system, essentials of systems design including the system's hardware, software, network environment and user interface. More advanced systems design concepts are discussed like object-oriented design and making the system operational through implementation, software testing and deployment issues. Students study the design of both functional and structural aspects of software that is of sufficient size and complexity as to require the efforts of several people for many months. Modelling languages are used to explain the information systems. Current trends in system development are highlighted.

IS518: Selected Topics in Information Systems

موضوعات مختارة في نظم المعلومات

Selected Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of Information Systems. Topics chosen for study will be by arrangement with the department.

IS530: Diploma Project

مشروع الدبلوم

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

توصيف مقررات الماجستير فى تخصص نظم المعلومات

IS600: Advanced Database Systems

نظم قواعد البيانات المتقدمة

This course will cover object and object relational database systems, complex type structures for objects and literals, encapsulation of operations and persistence of objects, types of database hierarchies and inheritance. The course will also cover object database extensions to SQL that includes: user-defined types and complex structures for objects, object identifiers using reference types, object data management group (ODMG) that includes: object definition language, object query language, and bindings to object oriented programming. The course will also cover extensible markup language (XML) that includes: structured, semi-structured and unstructured data, XML hierarchical data model, XML documents, and XML schema, storing and extracting XML documents from databases.

IS601 Advanced Software Engineering

هندسة البرمجيات المتقدمة

The course aims to develop the broad understanding of the discipline of software engineering by considering the wider systems engineering context in which software plays a role. It aims to examine the concepts and techniques associated with several advanced and industrially relevant topics, relating to both the product and processes of software engineering. It seeks to complement this with an account of the associated practical and professional issues in software engineering.

IS611: Software Architecture and Design

تصميم وهيكلة البرمجيات

This course teaches the principles and concepts involved in the analysis and design of large software systems. Basically in the following: Express the analysis and design of an application using UML, Specify functional semantics of an application using OCL, Specify and evaluate software architectures, Select and use appropriate architectural styles, Understand and apply object-oriented design techniques, Select and use appropriate software design patterns, Understand and perform a design review.

IS612: Leadership, Entrepreneurship and Learning

القيادة وريادة الاعمال والتعلم

The course focuses on introducing the entrepreneurial aspects of leadership and how to act in both intrapreneurial and entrepreneurial ways to bring about change in an organization. It includes introduction to types of businesses in IS environment. Students should learn how to diagnose complex organizational challenges, design action plans for solving organizational problems, and offer recommendations to prevent future problems. It includes case studies targeted at three key aspects of a leader’s capabilities: leadership, entrepreneurship, and learning. The cases will require students to use a variety of lenses to analyze each situational challenge: individuals, groups, systems, and self.

IS613: E-Business System Solution

حلول نظام العمل الألكترونى

This course focuses on analysis, design, development, and deployment of e-business solutions. The course covers the advanced e-business issues, such as; E-business building tools and techniques, E-business risk management; Internet protocols and security standards; Electronic payment systems and intelligent agents, and Tools and techniques to enhance and manage e-Business projects. Wireless and mobile electronic commerce architecture and applications. Electronic banking, digital cash. Wireless exchanges, business models.

IS614: Agile Software Development

طريقة الاجايل في تطوير البرمجيات

This course is an immersive experience in Agile software development. It includes the topics of both the technical and cultural/social aspects of Agile, including: pair and mob programming, high-performance teams with the Core Protocols, test-driven development, behavior-driven development, continuous delivery, clean code, refactoring, extreme programming, Scrum, Kanban, and Agile project management.

IS615: Business Process Management

إدارة عمليات الأعمال

This course examines concepts of Business Process Management in terms of Modelling, analysis and evaluation. It includes the use of analytical tools that can be used to model, analyze, understand and design business processes especially workflow systems. Strategic and tactical issues involved with a process-oriented perspective on enterprises and their IT-applications are addressed. Based on foundation concepts drawn from approaches such as Business Process Reengineering, process innovation, and strategic information systems, students will examine techniques for the identification and modelling of relevant processes. The role of enterprise systems (e.g. SAP) in support of business processes should also be investigated.

IS616: Database Application Design and Implementation

تنفيذ وتصميم تطبيقات قواعد البيانات

This course will cover contemporary strategies for the design and implementation of applications supported by back-end database systems. Recent methods and intelligent technologies for storing and retrieving data files and databases from back-end storage system will be covered. The course will contain evolution of storage architecture, key characteristics of data centers, core elements of data centers, disk drive components and performance, host access to storage through direct-attached storage (DAS), data protection using RAID technology, key components of intelligent storage system, cache management and protection techniques, storage provisioning methods, Fiber channel storage area network (FC SAN) with its major components, architectures, and zoning mechanism. The course will also cover IP SAN protocols, components, and topology, network-attached storage (NAS), object – based storage model, storage and retrieval process in object-based storage devices.

IS617: Database Security and Cryptography

تشفير وأمان قواعد البيانات

This course will cover advanced topics of cryptographic techniques applied to database systems such as symmetric ciphers, public key cryptography, RSA Algorithm, key management, Diffie-Hellman key exchange, elliptic curve algorithm, message authentication code and hash functions. The course will also cover cryptographic protocols such as protocol building blocks, multiple-key public key cryptography, intermediate protocols like undeniable digital signatures, designated confirmer signatures, proxy signatures, group signatures, fail-stop digital signatures, bit commitment, fair coin flips. Advanced protocols of cryptography will be also covered in the course such as zero-knowledge proofs, zero-knowledge proofs of identity, blind signatures, identity-based public-key cryptography, oblivious transfer, oblivious signatures, simultaneous contract signing. Advanced cryptographic techniques will be covered in the course such as key length, key management, and secret-sharing algorithms.

IS618: Data Analytics for Information Systems

تحليل البيانات لنظم المعلومات

This course will cover recent techniques and algorithms of data science technology. The course includes: introduction to big data analytics, techniques for business intelligence and data science, data analytics lifecycle to a case study scenario, frame a business problem as an analytics problem, and identifying main deliverables in an analytics project. The course will also cover review of basic data analytic methods using R programming and basic analytics methods such as distributions, statistical tests and summary operations to investigate a data set.

IS619: Knowledge Engineering

هندسة المعرفة

Knowledge Engineering (KE) concerns the basic issues involved in building and using Knowledge-based systems (KBS), i.e. acquisition, representation, explanation, validation of knowledge. Knowledge-based systems (KBS) are intelligent problem solvers that represent and reason about domain knowledge. This course focuses on Learning: Acquire knowledge from experts with or without supervision, Modelling: Represent knowledge in computer-readable format for which appropriate inference methods exist, Development: Design/Implement a KBS that solves the problem at hand, and Validation: Test the performance of the system according to some performance measure.

IS620: Management of Information Assurance

إدارة ضمان المعلومات

Information assurance (IA) is concerned with protecting the reliability of information and managing risks related to the use, processing, storage, and transmission of information. It includes securing the systems and processes that house and manipulate the data as well. IA includes protection of the integrity, availability, authenticity, non-repudiation and confidentiality of organizational data. As opposed to information security and cybersecurity, IA relates more to the business value and strategic risk management of information and related organizational systems, rather than focusing on the creation and application of security controls. Students will learn to defend against malicious attacks while considering corporate governance issues such as privacy, regulatory and standards

compliance, auditing, business continuity, and disaster recovery as they relate to an organization's information assets.

IS621: Information Systems Security

أمان نظم المعلومات

The course will provide students with skills and knowledge needed to secure organizational resources to develop effective methods to detect and monitor external and internal malicious activities. Topics covered in this course include: passive and active attacks, technology audits, physical security, computer security policies, contingency planning, business impact analysis, password management, information warfare, intrusion detection, risk assessment and auditing, operational security, permissions and user rights, service patches, securing network services, and security baseline analyzers. Students will learn to identify threat vectors and to develop strategies for implementing a prioritized, risk-based approach to mitigating security. The course will also cover legal, professional and ethical responsibilities of information risk and security management through real-world case based scenarios. The public or private sector must ensure that their information systems comply with privacy and security laws, regulations, directives, and any organizational policies, procedures, and guidelines.

IS622: Ethical, Legal and Social Issues in Information Systems

الاعتبارات الأخلاقية والقانونية والاجتماعية في نظم المعلومات

This course examines the ethical, legal, and social responsibilities of the practicing professional IS specialist and introduces students to the topics of IS ethics including: definitions, rules and policies of computer ethics, hacking, viruses, Internet ethics, freedom of expression on Internet, computer professionals and social responsibilities, software copyright, computer crime, public safety, intellectual property and professional codes of ethics, software privacy, cyber law and privacy and security of computerized information. This course is a case-based survey of contemporary legal, social and ethical issues faced by IS professionals. Topics include; Review of information security concepts (risk assessment and control frameworks, threats, management, and governance), Privacy concepts (privacy rights, breach reporting, and federal and state legal concepts), and Legal concepts related to authority, federal and state law, and property (intellectual property, trademarks, and copyright). Students will conduct on-line research and explore ethical issues at the leading edge of the organization's technology boundaries.

IS623: Information Systems Strategy and Governance

استراتيجية وحوكمة نظم المعلومات

This course will explore how information, IT and ISs relate in the total enterprise for business strategy and success in the marketplace. The course then addresses the role of corporate governance, IT and ISs in this area. Business analysis is used to develop a problem solving and decision making approach to IT strategy and governance. You will use knowledge of business practice, IT systems and strategy to uncover, explore and then resolve business problems and develop an understanding of their application to and integration with corporate and IT governance. This course includes a Work Integrated Learning (WIL) experience in which your knowledge and skills will be applied and assessed in a real or simulated workplace context and where feedback from industry and/or community is integral to your experience. The course aim is to provide

students with a balanced view and deeper understanding of developing ISs strategy and managing ISs from organizational and technical perspectives so that they have a theoretically sound, but nevertheless practically oriented foundation, from which to successfully tackle ISs projects, initiatives and implementations. Related topics; security audit and compliance, strategic ISs management, building high performance organizations, marketing within the global economy, management and organizational change, leading strategic decision making, and research skills for managers.

IS624: Information Architecture

معمارية المعلومات

The course introduces students to the core concepts, practices, and resources of the interdisciplinary field of information architecture (IA) and many aspects of user experience design (UXD). IA is concerned centrally with designing consistent, user-centered taxonomies, labels, global and local navigation systems, internal website search functionality, metadata, and structured vocabularies, the logical and information design in contrast to the physical or visual design of websites. UXD consists of information architecture, interaction design, and user research. Students will first learn how to critically analyze existing websites from an informed information architectural perspective. They will go on to learn about various kinds of IA research, create a website strategy and design, and conduct a website usability test. Among various concrete deliverables, students will create a conceptual sitemap/blueprint diagram, several kinds of webpage mock-up wireframe diagrams for web browser and mobile device displays, a portion of an interactive website prototype, a usability test report, and in the end tie these together in an information architecture design report that can also serve as a kind of portfolio when job seeking.

IS625: Research Seminars in Information Systems - I

الحلقات البحثية في نظم المعلومات - I

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

IS626: Advanced Topics in Information Systems - I

موضوعات متقدمة في نظم المعلومات - I

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of Information Systems. Topics chosen for study will be by arrangement with the department.

توصيف مقررات الدكتوراه في تخصص نظم المعلومات

IS700: Quantitative Methods in Information Systems

الأساليب الكمية في نظم المعلومات

The course deals with research problems, measured data, statistical methods, statistical description and analysis, from information systems perspective. The course covers how a research question is formulated and operationalized to a statistical survey design, and how it can be implemented in the form of a statistical survey. Moreover, the course should include how to use and present statistical information. Upon completion of the course the research student will be able to use, and evaluate the use of, statistical methods in information systems research. The course includes the use of tools for statistical analysis and presentation.

IS701: Systems Thinking and Modeling for Information Systems

نظم التفكير والنمذجة لأنظمة المعلومات

This course in systems thinking assesses IS/IT systems by examining the entire system, including human, community, resource, environmental, and social processes, to get a holistic view into how organizations and individuals often look at the world, assess problems, and invent solutions. Because the way systems are designed determines outcomes, the course also looks at system dynamics and the intended and unintended consequences of various actions. Using nonlinear thinking to complement typical linear way of thinking, students will learn, step by step, the standard methods of system dynamics governed by levels/rates or stocks/flows processes. They will conceptualize and build a system dynamics model, from scratch, conduct appropriate model analysis, and develop model-based recommendations. Based on hands-on experience in computer simulation and gaming, students will learn to perform model formulation and validation in diverse settings.

IS711: Enterprise Architecture

هيكلة المؤسسات

Introduce concepts and models of enterprise architectures including: Enterprise modeling, enterprise modeling languages, enterprise architecture and architecture alignment, case studies. The course focuses on several recent trends such as the adoption of software product line engineering (SPLE) by many sectors of industry, and a move towards designing self-adaptive software that can respond to environmental changes. In this course, students will study software architecture with a focus on software validation techniques that leverage architectural models, an architectural description language ADL, feature modeling for SPLE, and learn about self-adaptive software. Moreover, the course concentrates on the interdependencies among these architectures. The course should utilize management research on organizational integration and coordination. The student will learn how to design in the large enterprise architecture, make appropriate choices about architecture in relationship to overall organization goals, understand the different mechanisms for coordination available, and create a process for establishing and maintaining ongoing enterprise architecture.

IS712: Leading Change

قيادة التغيير

This course includes in-depth analysis of prevalent issues related to organizational change; i.e. organizational change in varied profit & non-profit organizations, behaviors/characteristics to establish credibility and legitimacy as a change agent in technology-based organizations, the current dynamic social, political, and cultural environment for change and its potential impact on contemporary organizations and its information systems, the role of conflict in organizational change and how to guide conflict to serve the interests of the learning organization, fundamental theories of leadership, change and their application.

IS713: New Directions in Software Engineering

الاتجاهات الحديثة في هندسة البرمجيات

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

IS714: Software Requirements Analysis

تحليل متطلبات البرمجيات

The course includes techniques for eliciting requirements, Languages and models for representing requirements, Perspectives and viewpoints, Analysis and validation techniques, including need, goal and use-case analysis,. Requirements in the context of system engineering, Specifying and measuring external qualities: performance, reliability, availability, safety, security, etc. Specifying and analyzing requirements for various types of systems: embedded systems, consumer systems, web-based systems, business systems, and systems for scientists and other engineers. Moreover, Resolving feature interactions, Requirements documentation standards, Traceability, Human factors, Requirements in the context agile processes, Requirements management: Handling requirements changes.

IS715: Formal Information Systems

نظم المعلومات الصورية

The course provides an overview on what formality needed for information systems and why it I needed. It covers areas of Formal Specification Methods: Formal Proofs, Formal Specifications, Model Checking, and Abstraction. The Model Oriented specifications; Construct a model of the system behavior using mathematical objects like sets, sequences. Such as State charts, SCR, VDM, Z, Petri Nets, CCS, CSP, Automata theoretic models. The Property Oriented specifications including the Use of a set of necessary properties to describe system behavior, such as axioms, rules etc., e.g. Algebraic semantics and Temporal logic models.

IS716: Advanced Database Management and Administration

تنظيم وإدارة قواعد البيانات المتقدمة

This course will cover various topics in database management systems (DBMS), administration, security, stored procedures, triggers, transactions, functions, data mining, data warehousing, and remote access to databases. The course will provide students with an advanced understanding of database design, implementation, and management concepts and techniques with the ability to apply performance tuning techniques, justify and define user's roles, permissions, and access-levels as a database administrator. Backup and recovery methods will be covered in this course such as: backup granularities, backup architecture and recovery operations, various backup targets, data de-duplication, backup in virtualized environment, and data archiving. Recent topologies and backup in NAS environment will be covered such as: direct-attached backup, LAN-based backup, SAN-based backup, mixed backup topology. De-duplication methods and implementations will be covered.

IS717: Data Warehousing and Mining

التخزين والتنقيب عن البيانات

This course will cover techniques of data warehousing and mining, data warehouse components, extraction, transformation, and load of data warehouse, online analytical processing, data warehouse deployment, data warehouse and data mart front-end applications. The course will also cover relational database and data warehousing, data warehousing middleware, business intelligence with data warehouse, simple database querying and reporting, business analysis (OLAP), association rules mining, classification, clustering, sequential data mining and neural networks for data mining, data warehousing driving quality and integration, data warehousing sorting, working with data warehousing consultant, sources of up-to-date information about data warehouse, mandatory skills for data warehousing consultant.

IS718: Information Systems and Cyber Security

نظم المعلومات والأمن عبر الإنترنت

This course provides technical aspects of cyber security in information systems. It describes threats and types of attacks against information systems to enable students understanding and analyzing security requirements and define security policies. Security mechanisms and enforcement issues will be introduced. Students will be immersed in cyber-security discipline through a combination of intense coursework, open-ended and real-world problems, and hands on experiments. The course will also cover computational security and modern cryptographic techniques, public key encryption and number theory, authentication mechanism biometrics, two factor authentication, privacy settings, personal data sharing, and data inference.

IS719: Big Data Analytics and Data Science

تحليلات البيانات الكبيرة وعلوم البيانات

This course should cover introduction to big data, big data modeling and management systems, big data integration and processing, machine learning with big data, graph analytics for big data. This course will also cover advanced analytics – theory and methods. The advanced analytics includes: examine analytic needs and select an appropriate technique based on business objectives, initial hypotheses, and the data's structure and volume. Algorithms and technical foundations of data

science will be also covered with applying most commonly used methods in analytics solutions. Advanced analytics software packages should be used through labs.

IS720: Information Systems Auditing

تدقيق نظم المعلومات

Computer forensics is the application of computer investigation and analysis techniques to the process of discovering and preserving potential legal evidence. Systems auditing is concerned with ensuring that adequate security controls are in place to prevent or at least discover fraud or other misuse of IT resources. Legal evidence might be sought in a wide range of computer crimes or misuse and students in this course will develop an understanding of forensic and auditing and will develop the skills needed for discovering and preventing theft of trade secrets, theft of or destruction of intellectual property, and fraud. They will learn how to recover deleted, encrypted, or damaged file information and to plan and execute audits of security and other related IT procedures. This course is intended to provide a foundation in computer forensics and auditing, and provide hands-on practice in applying forensic and auditing techniques.

IS721: Information Systems Quality Assurance

ضمان جودة نظم المعلومات

The course takes its starting point in well-established research around information systems quality and highlights three subareas; Information Quality, Software Quality and Business Value. This course is about the theory, models and practice of software testing and quality assurance. The subject matter focuses on three broad areas:- (1)Theory of Software Testing that reviews the relevant techniques and research results, the aim is to provide the student with a solid foundation from which to build real-world testing systems and teams. (2) Testing in practice that looks at the process and practice of testing, including the role of tester in an iterative, incremental development project. (3) Test automation is essential for modern software testing. Several automation methods are discussed and a survey of tools, both commercially available ones and homegrown is performed. The course will mostly be based on research papers and the latest publications in the community of quality assurance.

IS722: Business Process Modeling and Workflow Systems

نمذجة عمليات الأعمال ونظم التدفق

This course examines concepts of Business Process Modelling and analytical tools that can be used to model, analyze, understand and design business processes especially workflow systems. Strategic and tactical issues involved with a process-oriented perspective on enterprises and their IT-applications are addressed. Based on foundation concepts drawn from approaches such as Business Process Reengineering, process innovation, and strategic information systems, students will examine techniques for the identification and modelling of relevant processes. The role of enterprise systems (e.g. SAP) in support of business processes should also be investigated.

IS723: E-Business Technologies and Applications

تكنولوجيا وتطبيقات الأعمال الإلكترونية

This course aims to develop students' abilities to analyze and evaluate electronic business applications, as well as design of electronic business models. The focus should be on the strategic,

managerial, operational and technical factors in the development of an organization's e-business competencies and capabilities. It includes the current business and technology trends including the individual, business and societal implications of e-business. The course makes extensive use of current case studies and gives students the opportunity to design new e-business models. The role of new trends like cloud computing and block chain technologies are highlighted.

IS724: Advanced Information Retrieval

استرجاع المعلومات المتقدمة

The course introduces advanced topics and research advancements in information retrieval. It includes: Indexing for information retrieval, evaluation of IR systems, relevance feedback and query expansion, recommendation in IR systems, probabilistic information retrieval, clustering and classification in information retrieval.

IS725: Research Seminars in Information Systems - II

الحلقات البحثية في نظم المعلومات - II

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

IS726: Advanced Topics in Information Systems - II

موضوعات متقدمة في نظم المعلومات - II

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of Information Systems. Topics chosen for study will be by arrangement with the department.

توصيف مقررات دبلوم الدراسات العليا في تخصص نظم المعلومات الجغرافية والاستشعار عن بعد

GIS511: Geographic Information Science and Systems

علوم ونظم المعلومات الجغرافية

Provides an understanding of the theory, data models and associated issues (such as uncertainty) that underlie GIScience and the way these are applied to, and effect, spatial analysis and spatial data management. This course discusses GIS concepts and terminology, the role of GIS in spatial data management and digital mapping, the multipurpose cadastre and resource GIS, methods of data collection and input, data modelling and representation, storage and retrieval of spatial data, concepts of database systems, manipulation and analysis features of GIS.

GIS512: Remote Sensing

الاستشعار عن بعد

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

GIS513: Spatial Analysis and Modeling

التحليل والنمذجة المكانية

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

GIS514: Geodatabase Design, Management and Administration

تصميم وتنظيم وإدارة قواعد البيانات الجغرافية

This course establishes the foundations of data organization and database management systems (DBMS). The module covers techniques and tools for the design of DBMS. Various types and architectures of DBMS are discussed with special emphasis on relational, object-oriented and object-relational databases. Structured Query Language (SQL) is introduced both from the point of view of the logic of querying a relational database as well as defining its structure. The second part of this module deals with geoDBMS, i.e. DBMS specially tailored to handle spatial data. In particular, the representation of simple features as well as an efficient multidimensional access to spatial data are discussed. Concepts of warehousing and benefits of data mining conclude this module.

GIS515: Spatial Data Acquisition Techniques

تقنيات الحصول على البيانات المكانية

Role of global positioning systems, maps, geocoding and other kinds of sensors as geospatial data sources. Therefore quality concepts and metrics are introduced. Rapid increase of data and its availability requires metadata for their effective and efficient search; thus the principles of metadata are presented. The module concludes with a discussion of related legal aspects and ethical issues.

.

GIS516: GIS Management and Implementation

إدارة وتنفيذ نظم المعلومات الجغرافية

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

GIS517: GIS Programming and Customization

برمجة وتخصيص نظم المعلومات الجغرافية

This course provides an introduction to the development of GIS applications. During this course students will learn to use programming techniques to create applications that perform fundamental spatial analysis and automation tasks, such as geoprocessing, editing, database management, projecting data, and map creation.

GIS518: Selected Topics in GIS and Remote Sensing

موضوعات مختارة في نظم المعلومات الجغرافية والاستشعار عن بعد

Selected Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of of geographic information systems (GIS) and remote sensing. Topics chosen for study will be by arrangement with the department.

GIS530: Diploma Project

مشروع الدبلوم

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

توصيف مقررات الماجستير فى تخصص نظم المعلومات الجغرافية والإستشعار عن بعد

GIS600: Spatial Information Systems

نظم المعلومات المكانية

The unique characteristics and importance of spatial information as they relate to the evolving science, technology and applications of spatial information systems. These systems have the principle functions of capturing, storing, representing, manipulating, and displaying data in 2-D and 3-D worlds. This course approaches its subject from the perspectives of informatics and geography, presenting methods of conceptual modeling developed in computer science that provide valuable aids for resolving spatial problems. This course discusses introduction to the spatial context, geometries for spatial data, and conceptual modelling for spatial data.

GIS601: Remote Sensing for GIS

الاستشعار عن بعد لنظم المعلومات الجغرافية

Principles of remote sensing, satellite systems and role of remote sensing data in GIS applications. This course is designed to provide students with the basic knowledge of biophysical, quantitative, and digital remote sensing. Both the theoretical basis and practical aspects of these approaches to remote sensing are addressed. Topics examine include remote sensing applications in natural environment such as meteorology, oceanography, hydrology, and biomass detection.

GIS611: Spatial Databases Design, Management and Administration

تصميم وتنظيم وإدارة قواعد البيانات المكانية

This course covers geospatial database design, implementation, management, and access course for students interested in organizing spatial and non-spatial data in geospatially enabled enterprise Database Management Systems (DBMS). Students will gain a basic understanding of database systems terminology, design principles, and issues facing database managers and analysts. They will gain practical database experience utilizing commercial database management system software and geographic information systems software to design and use spatial and non-spatial data

GIS612: Advanced Spatial Analysis and Modeling

التحليل والنمذجة المكانية المتقدمة

This course focuses on the advanced spatial analysis capabilities of GIS. Spatial analysis can be used for evaluating, estimating, predicting, interpreting, and understanding geographical information. Spatial analysis is one of the most important components of any GISystem. The course will also cover density mapping, spatial modeling, raster overlay, proximity analysis, 3D spatial data visualization, and network analyses. The process of analyzing geographical data is called geographical or spatial analysis. Particular attention is paid to issues like map algebra, distance-based analysis, network analysis, allocation, interpolation and fuzzy-set analysis.

GIS613: Advanced GIS Programming and Customization

برمجة وتخصيص نظم المعلومات الجغرافية

Provides instruction and hands-on experience in specific techniques and languages for developing application systems based on GIS concepts. Students will learn to use current generation

programming language to design and implement GIS applications. During this course students will learn to use programming techniques to create applications that perform fundamental spatial analysis and automation tasks, such as geoprocessing, editing, database management, projecting data, and map creation. Class exercises further provide experience to customize and develop advanced GIS tools.

GIS614: Digital Cartography

الكارتوجرافيا الرقمية

Visualization and cartography are located at the business end of the GIS stream. After all the data compilation, data processing and data analysis (often in the middle of all this), a GIS expert will have to choose what information is necessary to display to achieve a particular goal. This module will be looking at issues of purpose, parsimony, and design; that is, why, what and how to (spatially) communicate. Cartography and GIS are tools which serve communication goals. The recent use of computers in cartography and consequently in GIS have considerably changed the design and presentation of maps and diagrams. Foundations of cartography and of visual communication are revisited. Issues such as static, dynamic, surface or fly-through visualization are discussed as well as some cutting-edge work in GIS like immersive visualization tools or 3D rendering of geospatial objects.

GIS615: Spatial Data Sources and Acquisition

مصادر جمع البيانات المكانية

This course focuses on acquisition of spatial data, its principles and respective techniques. Data quality is directly connected to the applied acquisition method(s). Therefore quality concepts and metrics are introduced. Rapid increase of data and its availability requires metadata for their effective and efficient search; thus the principles of metadata are presented. The module concludes with a discussion of related legal aspects and ethical issues.

GIS616: Open and Distributed GIS Infrastructures

البنية التحتية لنظم المعلومات الجغرافية الموزعة والمفتوحة

Currently, all over the globe and at all scale levels, Spatial Data Infrastructure projects can be recognized. Their aim is to improve the availability of and access to geospatial data. With the paradigm shift ”from systems to services“, Spatial Data Infrastructures, spatial data market place and geo business have become keywords in the GIS world. A common understanding of these concepts is given which helps to evaluate the political and economic impact of distributed geo-processing and the OGC process. The technological side to these developments such as WMS as the first Web Service standard of the OGC, and XML and GML are introduced.

GIS617: Spatial Statistics

الاحصاء المكاني

This course reviews some popular approaches to statistically analyze data in their spatial context, providing hands-on experience with widespread software. The module starts with a review of basic statistical concepts and their extension by adding the spatial aspect; it then explains concepts and methods of pattern analysis, introduces methods for measuring spatial dependence, and finally provides a compact gateway to geostatistics.

GIS618: Spatial Decision Support Systems

نظم دعم القرارات المكانية

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

GIS619: GIS Organization and Project Management

تنظيم وإدارة مشروعات نظم المعلومات الجغرافية

Initially, GIS were considered a technological challenge to be solved by technological progress. Now we recognize that the organizational environment is perhaps the single most critical success factor for GIS implementation and projects. Projects are not just organizational frameworks to reach operative objectives. Looking at the top-down process of enterprise strategic planning leading to specific business activities, we recognize 'project orientation' as a centerpiece. Project management is the discipline of defining and achieving targets while optimizing the use of resources such as time, money, people, and space, and is the focus of the first part of this module. The last part of the module discusses issues such as GIS in organizations, planning, and procurement. In addition issues of quality management and legal issues are touched on, and it concludes by pointing out leading innovation in the GI economy.

GIS620: Web and Mobile GIS

نظم المعلومات الجغرافية على الويب والمحمول

This course discuss the design and implementation of locally served and cloud-based geospatial web applications. Construction of web maps, mashups and volunteered geographic information interfaces. This course will also discuss design, coding and implementation of mobile GIS applications using the Java and JavaScript object-oriented programming languages.

GIS621: Digital Photogrametry

المساحة التصويرية الرقمية

The course aims at providing basic photogrammetry concept, procedure, processing task. Error analysis is also considered and explained with various methods. During the course students increases knowledge and practical skills about the digital photogrammetric methods of measuring of images. After passing the course, the students are be able to use of digital methods of preparation of aerial photographs.

GIS622: Crime Mapping and Analysis

تحليل ورسم خرائط الجريمة

Examines the uses of GIS in law enforcement relating to how human behavior is mapped and analyzed for strategic deployment purposes. Crime, calls for service, and demographic data will be analyzed to illustrate the various GIS tools used by law enforcement analysts to address issues related to public disorder. Discusses crime mapping and analysis concepts as well as policing philosophies. Students will use ArcGIS to analyze crime series, conduct problem analysis, study crime trends, and address deployment issues as they relate to law enforcement.

GIS623: Applied Remote Sensing

تطبيقات الاستشعار عن بعد

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

GIS624: Medical GIS

نظم المعلومات الجغرافية الطبية

Explore how spatial data and geographic information systems (GIS) can be used to understand and improve public health. The environment in which we live and work can have a profound effect on our health – an effect that is explored by the emerging field of geohealth. This course will introduce you to new developments in geohealth, looking at the latest thinking and methods for using spatial data and geographic information systems (GIS) in health settings.

GIS625: Research Seminars in GIS - I

الحلقات البحثية في نظم المعلومات الجغرافية - I

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

GIS626: Advanced Topics in GIS - I

موضوعات متقدمة في نظم المعلومات الجغرافية - I

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of geographic information systems (GIS). Topics chosen for study will be by arrangement with the department.

GIS627: Research Seminars in Remote Sensing - I

الحلقات البحثية في الاستشعار عن بعد - I

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. Students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

GIS628: Advanced Topics in Remote Sensing - I

موضوعات متقدمة في الاستشعار عن بعد - I

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of remote sensing. Topics chosen for study will be by arrangement with the department.

توصيف مقررات الدكتوراه في تخصص نظم المعلومات الجغرافية والاستشعار عن بعد

GIS700: GIS Theories, Models and Issues

نظريات ونماذج وقضايا نظم المعلومات الجغرافية

Provides an understanding of the underlying theories, mathematical and geometric tools, and their computational implementations that establish GIS capabilities to handle and analyze geo-referenced information. Associated issues (such as uncertainty, spatial analysis and spatial data management) highlighted.

GIS701: Advanced Spatial Database Design, Management and Administration

تصميم وتنظيم وإدارة قواعد البيانات المكانية المتقدمة

The course will cover spatial data models, spatial query languages, database architecture, and database technology for spatial database systems. Storage structures, file organization, general and spatial index structures, implementation of relational and spatial operators, spatial query processing and optimization, transaction management and crash recovery, distributed spatial database systems. The course will also cover spatial data retrieval: algebras, relational and peano tuple, spatial queries, types, algorithms, access and quality: spatial indices and integrity constraints, hypermedia, multimedia spatial information systems and hypermaps.

GIS711: Spatial Data Mining

استخلاص البيانات المكانية

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

GIS712: Spatial Cognition and Computing

الادراك المكاني والحوسبة

Study of cognitive aspects for understanding spatial representations and reasoning processes. Qualitative representations of geographic space. Formalisms for topological, directional and metric relations; inference mechanisms to derive composition tables; geometric representations of natural language-like spatial predicates; formalizations of advanced cognitively motivated spatial concepts, such as image schemata; construction of relation algebras. The course will also cover Spatial Knowledge, and Intelligent Spatial Information Systems.

GIS713: Spatio-Temporal Data Modeling

نمذجة البيانات المكانية الزمنية

Introduces concepts necessary for designing and using a spatio-temporal information system. Covers formal models of time, conceptual models of time, fundamentals of temporal databases

spatio-temporal database systems, spatio-temporal query languages, event-based modeling and the visualization of temporal data.

GIS714: Raster Analysis and Modeling

التحليل والنمذجة للبيانات الشبكية

Course explores advanced topics in spatial analysis using the raster data model and 3D environments. The major theme in the course is that of modeling with the raster data model in a GIS environment. Real-world problem solving emphasizes site selection and environmental applications. Topics include Advanced raster processing, Multi-Criteria Evaluation, Terrain Creation Mapping and Visualization, Surface Morphometry, Watershed Delineation, and Viewshed Analysis.

GIS715: Network Modeling Using GIS

نمذجة الشبكات باستخدام نظم المعلومات الجغرافية

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

GIS716: Geocomputation

الحسابات الجغرافية

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

GIS717: Spatial Big Data

البيانات المكانية الضخمة

This course will introduce basic concepts and techniques related to Spatial Big Data from a computational perspective. Topics to be covered include: Introduction to Spatial Big Data Analytic, Types of Spatial Big Data, Spatial Statistic Foundation, Spatial Colocation Discovery, Spatial Outlier Analysis, Spatial Prediction, Spatial Hotspot, Spatial Summarization, Spatial and Spatiotemporal Change, Spatial Big Data Platform, Spatiotemporal Big Data, and Recent Trends.

GIS718: GIS and Cyber Security

نظم المعلومات الجغرافية والأمن عبر الإنترنت

This course introduces technical aspects of cyber security in geographic information systems. It describes threats and types of attacks against geographic information systems to enable students to

understand and analyze security requirements and define security policies. Security mechanisms and enforcement issues will be introduced.

GIS719: Advanced Digital Remote Sensing

الاستشعار عن بعد متقدم

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

GIS720: Cloud GIS

نظم المعلومات الجغرافية السحابية

This course teaches students to use cloud and server GIS resources to solve problems for which geospatial data is an integral element. We will evaluate and implement systems using three cloud service models (infrastructure services, platform services, and software services). The course will teach students to set up cloud services for creating maps, cloud services for managing spatial data, and cloud services for processing spatial data.

GIS721: Spatial Data Integration

تكامل البيانات المكانية

Role of crowdsourcing, volunteered geographic information, spatial data infrastructures and web portals in helping with the collection, storage, curation and distribution of geospatial data assets. The course will also cover the integration of geographic information systems (GIS) and remote sensing technologies. It builds on a student's existing knowledge and skills in spatial information, to examine the use of these GIS and remote sensing technologies as they apply to natural resource management problems. A major emphasis will be placed on students completing a case study incorporating the use of remote sensing and GIS. Students completing this subject are able to develop and present a project outline which requires the integration of remote sensing and GIS technologies.

GIS722: Radar Remote Sensing

الاستشعار عن بعد الراداري

Principles and applications of orbital and airborne radar remote sensing, including real and synthetic aperture radar systems. Principles of Radargrammetry and single-path and repeat-path interferometry. Applications of radar remote sensing in geosciences, land use and land cover mapping, forestry and agriculture, urban analysis.

GIS723: Microwave Remote Sensing

الاستشعار عن بعد باستخدام الميكروويف

This course is designed to provide fundamental knowledge and theories of microwave remote

sensing. After reviewing the fundamentals of electromagnetics, both real aperture and synthetic aperture radar systems are to be introduced including physical principles.

GIS724: Remote Sensing Data Analysis

تحليل بيانات الاستشعار عن بعد

The course aims at providing RS/GIS image analysis tool through pre and post processing on satellite images. There will be special emphasis on images registration, extraction, classification and accuracy assessment. The course will cover Image Registration, Image Classification, Image Understanding, Accuracy Assessment and Cartographic Design.

GIS725: Research Seminars in GIS - II

الحلقات البحثية في نظم المعلومات الجغرافية - II

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

GIS726: Advanced Topics in GIS - II

موضوعات متقدمة في نظم المعلومات الجغرافية - II

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of geographic information systems (GIS). Topics chosen for study will be by arrangement with the department.

GIS727: Research Seminars in Remote Sensing - II

الحلقات البحثية في الاستشعار عن بعد - II

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. Students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

GIS728: Advanced Topics in Remote Sensing - II

موضوعات متقدمة في الاستشعار عن بعد - II

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of remote sensing. Topics chosen for study will be by arrangement with the department.

المحتوى العلمي لمقررات قسم تكنولوجيا المعلومات

توصيف مقررات دبلوم الدراسات العليا فى تخصص تكنولوجيا المعلومات

IT511: Multimedia Systems

الوسائط المتعددة

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

IT512: Computer Networks

شبكات الحاسب

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

IT513: Digital Signal Processing

معالجة الإشارات الرقمية

In this course, a detailed examination of basic digital signal processing operations including sampling/reconstruction of continuous time signals, Fourier and Z-transforms will be given. The Fourier and Z-transforms will be used to analyze the stability of systems, and to find the system transfer function. The discrete Fourier transform (DFT) and fast Fourier transform (FFT) will be studied. Finally, we will examine time and frequency domain techniques for designing and applying infinite impulse response (IIR) and finite impulse response (FIR) digital filters. Two-dimensional signals and introductory image processing operations will also be discussed.

IT514: Embedded System

النظم المدمجة

In this course, the fundamentals of embedded system hardware and firmware design will be explored. Issues such as embedded processor selection, hardware/firmware partitioning, glue logic, circuit design, circuit layout, circuit debugging, development tools, firmware architecture, firmware design, and firmware debugging will be discussed. Interfacing to various hardware components for real application will be discussed. The components include LED, Switches, keypad, LCD, 7-Segment display, serial port, temperature sensors, and timers.

IT515: Image Processing

معالجة الصورة

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

IT516: Computer Graphics

الرسم بالحاسب

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

IT517: Network Programming

برمجة الشبكات

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

IT518: Selected Topics in Information Technology

موضوعات مختارة في تكنولوجيا المعلومات

Selected Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of Information Technology. Topics chosen for study will be by arrangement with the department.

IT530: Diploma Project

مشروع الدبلوم

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

توصيف مقررات الماجستير فى تخصص تكنولوجيا المعلومات

IT600: Foundations of Modern Networking

أساسيات الشبكات الحديثة

This course provides the student with a thorough understanding of SDN and NFV and their practical deployment and use in today's enterprises. In addition, the course provides clear explanations of QoS/QoE and the whole range of related issues, such as cloud networking and IoT .

IT601: Advanced Signal Processing

معالجة الإشارات المتقدمة

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

IT611: Advanced Image Processing

معالجة الصور المتقدمة

This course a bit advanced topics on digital image processing. Topics to be covered include: basic operations, image different representation, image transformations, edge detection, local features and adaptive noise removal methods. Object classification, template matching techniques and basic image based tracking will also be examined.

IT612: Advanced Computer Interfaces

مواجهات الحاسب المتقدمة

The course focuses on the latest research on hardware interfaces used in modern information technology like; universal external interfaces, peripheral device interfaces, external memory interfaces, expansion buses, wireless interfaces, network interfaces, and auxiliary serial interfaces. Specific technologies covered include LPT, COM, USB, FireWire, SCSI, mouse, monitor, printer, audio and video interfaces, Serial ATA and flash cards, ISA, PCI, EISA, PC/104, AGP, LPC, PCMCIA, CardBus, Bluetooth, SPI, MII, SMI, JTAG, and Ethernet

IT613: Network Security Protocols

بروتوكولات امان الشبكة

This course intended to give students hands-on experience in using a variety of analysis techniques to evaluate cryptographic protocols and other security mechanisms. A network protocol such as SSL (Secure Sockets Layer) may fail in three ways: the protocol design may be flawed, the cryptography may be inadequate, or the implementation may be buggy. This course is primarily concerned with techniques for identifying design flaws, but also is about cryptography and secure implementation to the extent that they affect protocol design.

IT614: Network Algorithms and Simulation Techniques

خوارزميات الشبكات وتقنيات المحاكاة

This course intended to give students hands-on experience in algorithm design applied to networked system, implementation of novel networking systems, measurement of existing network protocols, and simulation of network algorithms

IT615: Data Compression Techniques

تقنيات ضغط البيانات

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

IT616: Advanced Network Programming

برمجة الشبكات المتقدمة

This course is an advanced programming in computer networks. The focus of the course is on the study of middleware and enabling technologies that are used in building networked and distributed environments and applications. Concepts such as open systems, interoperability, portability, integration are emphasized. Provide an in-depth understanding of major middleware and application level issues, as well as design and implementation skills in the development of applications using advanced network architectural model

IT617: Real Time Systems

نظم الزمن الحقيقي

This course introduces the characteristics of real-time embedded systems, typical embedded hardware components, fundamental real-time operating system features, well-known real-time task scheduling algorithms, and widely used resource access control protocols. It also presents several formal approaches for real-time embedded system design, modeling, analysis and critical property verification. For those who are interested in real-time software development, the course will familiarize them with techniques and skills in concurrent programming and real-time task implementation.

IT618: Coding Theory

نظرية الترميز

This course is meant to serve as an introduction to some basic concepts in information theory and error-correcting codes, and some of their applications in computer science and statistics. The course

covers the following topics: Introduction to entropy and source coding. Some applications of entropy to counting problems. Mutual information and KL-divergence. Method of types and hypothesis testing. I-projections and applications. Introduction to error-correcting codes. Unique and list decoding of Reed-Solomon and Reed-Muller codes. Applications of information theory to lower bounds in computational complexity and communication complexity

IT619: Automatic Speech Recognition

التعرف الآلى على الكلام

This course introduces students to the rapidly developing field of automatic speech recognition. Its content is divided into three parts. Part I deals with background material in the acoustic theory of speech production, acoustic-phonetics, and signal representation. Part II describes algorithmic aspects of speech recognition systems including pattern classification, search algorithms, stochastic modeling, and language modeling techniques. Part III compares and contrasts the various approaches to speech recognition, and describes advanced techniques used for acoustic-phonetic modeling, robust speech recognition, speaker adaptation, processing paralinguistic information, speech understanding, and multimodal processing.

IT620: Wireless and Mobile Networks

الشبكات اللاسلكية والمتحركة

This course provides provides a comprehensive treatment of wireless data and telecommunication networks. Topics include recent trends in wireless and mobile networking, wireless coding and modulation, wireless signal propagation, IEEE 802.11a/b/g/n/ac wireless local area networks, 60 GHz millimeter wave gigabit wireless networks, vehicular wireless networks, white spaces, IEEE 802.22 regional area networks, Bluetooth and Bluetooth Smart, wireless personal area networks, wireless protocols for Internet of Things, ZigBee, cellular networks: 1G/2G/3G, LTE, LTE-Advanced, and 5G.

IT621: Embedded Systems

لنظم المدمجة

In this course, the fundamentals of embedded system hardware and firmware design will be explored. Issues such as embedded processor selection, hardware/firmware partitioning, glue logic, circuit design, circuit layout, circuit debugging, development tools, firmware architecture, firmware design, and firmware debugging will be discussed. Interfacing to various hardware components for real application will be discussed. The components include LED, Switches, keypad, LCD, 7-Segment display, serial port, temperature sensors, and timers.

IT623: Cryptography

التشفير

This course features a rigorous introduction to modern cryptography, with an emphasis on the fundamental cryptographic primitives of public-key encryption, digital signatures, pseudo-random number generation, pairing-based cryptography, attribute-based cryptography and basic protocols and their computational complexity requirements.

IT624: Cloud Computing Infrastructure and Services

هيكل وخدمات الحوسبة السحابية

The course covers the following topics: 1) Analyze the meaning of cloud computing and understand the different cloud service categories. (Technologies) 2) Categorize cloud service types and be aware of privacy regulation impact on cloud application requirements. (Legal and Design) 3) Consider contract negotiations needed for cloud service delivery and develop the skills necessary to assess security breaches and their impact on the organization. (Risk Management) 4) Analyze when to use cloud applications and how architecture affects performance. (Technology) 5) Develop a cloud application with a user interface and understand data components. (Design).

IT625: Medical Imaging

التصوير الطبى

In this course different aspects related to medical imaging are introduced. Topics to be covered include: medical image acquisition and imaging modalities, medical images storage and transfer, image enhancement techniques for medical images, Feature extraction and selection, medical image segmentation focusing on model-based image segmentation and machine learning in image segmentation, shape analysis, content-based medical image retrieval. And finally several toolkits and software for developing medical imaging systems are discussed.

IT626: Virtual Reality

الواقع الافتراضي

In this course we will explore the techniques and technologies that need to be brought together to allow people to work efficiently in virtual worlds. Topics include systems for presenting information to all five senses (visual, auditory, haptic, olfactory, and gustatory), methods for users to interact with objects within virtual environments, and evaluation techniques for assessing effectiveness. Students will use various display and interface devices available for the course, develop prototype applications, and evaluate them. The format of the course will be a combination of traditional lecture, literature review, and hands-on work. Students will be expected to implement several techniques as part of this course.

IT627: Research Seminars in Information Technology - I

الحلقات البحثية في تكنولوجيا المعلومات - I

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

IT628: Advanced Topics in Information Technology - I

موضوعات متقدمة في تكنولوجيا المعلومات - I

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of Information Technology. Topics chosen for study will be by arrangement with the department.

توصيف مقررات الدكتوراه فى تخصص تكنولوجيا المعلومات

IT700: Advanced Computer Networks

شبكات الحاسب المتقدمة

Survey of computer networks covering end-to-end principle, multiplexing, virtualization, packet switching vs. circuit switching, router design, network protocols, congestion control, internet routing architecture, network measurement, network management, and overlay networks. Survey of research papers from classic literature through contemporary research.

IT701: New Directions in Signal Processing

الاتجاهات الحديثة في معالجة الاشارات

This course is designed to provide students with a broad perspective on the DSP field. The course will cover various advanced topics in DSP, including: multi-rate signal processing and filter banks; time-frequency analysis, short time Fourier transform (STFT), and wavelet transform; linear prediction and optimum linear filters; adaptive filtering; compressed sensing and sparse recovery.

IT711: New Directions in Image Processing

الاتجاهات الحديثة في معالجة الصور

Digital image processing has various applications ranging from remote sensing and entertainment to medical applications. This course explores a few major areas of digital image processing at an advanced level, with primary emphasis on medical applications. Topics covered include image segmentation, image registration, and validation of image processing algorithms. Examples will be presented to give the students exposure to real-world applications.

IT712: New Directions in Embedded Systems

الاتجاهات الحديثة في النظم المدمجة

Advanced topics in embedded systems, with focus on learning recent methods in circuit design and circuit layout.

IT713: Advanced Network Security

أمن الشبكات المتقدم

This course provides students with in-depth study and practice of advanced concepts in applied systems and networking security, including security policies, access controls, IP security, authentication mechanisms, cryptographic protocols, and intrusion detection and protection.

IT714: Advanced Topics in Robotics and Computer Vision

موضوعات متقدمة في الإنسان الآلي والرؤية بالحاسب

The course covers advanced computer vision techniques for object and category recognition, recognition of human activities from video streams and egocentric vision. This course will provide a comprehensive survey of the existing methods and discuss the performance of reviewed methods on several benchmark datasets. We will also consider the techniques needed for real-time interactive applications on robots or mobile devices, e.g. domestic service robots or mobile phones that can retrieve information about objects in the environment based on visual observation

IT715: Advanced Multimedia Systems

نظم الوسائط المتعددة المتقدمة

Basic Concepts of audio and video, MPEG, HEVC, and H.265 compression algorithms, QoS and resource management algorithms, streaming protocols, feedback control and adaptation algorithms for A/V streaming, peer-to-peer streaming and content-distribution networks, DASH, SIP, WebRTC, multi-modal synchronization algorithms, multimedia storage frameworks, QoE evaluation methods, and design and integration principles for multimedia systems such as mobile multimedia, Video 360, Teleimmersion, Voice-over-IP, Video Conferencing, and Video-on-Demand.

IT716: Secure Network System Design

تصميم نظام شبكة آمنة

This course provides the fundamental skills needed to analyze the internal and external security threats against a network, and to implement security mechanisms to protect an organization's information. The course helps to evaluate network and Internet security issues and provides security solutions such as the designing a security policy, troubleshooting networks, and digital signatures.

IT717: Advanced Speech Processing

معالجة الكلام المتقدمة

This course aims to give participants a deeper understanding of speech processing by presenting state-of-the-art technologies and current challenges. Rather than giving a coverall introduction to speech processing, the course will focus on selected topics with an emphasis on applications. Topics covered include speech analysis, speech coding, speech enhancement, speech recognition, speaker recognition and segmentation, and speech data mining and document retrieval

IT718: Modern Computer Architecture

معمارية الحاسب الحديث

The course has an emphasis on modern parallel computer systems (today multicores and graphic processors) and programming them. Areas covered are memory system organization, principles for multiprocessor systems, and a detailed coverage of the design of a CPU.

IT719: Wireless Sensor Networks

شبكات المجسات اللاسلكية

This course provides the fundamentals behind the design of wireless sensor networks. A primary focus of this course is to give students hands-on programming experience with various sensors and sensing platforms. Also the course provide the fundamental concepts of sensor network design, learn to apply sensor network protocols, mechanisms, and algorithms to implement sensing systems, design, program, simulate, and experiment with sensor network software and hardware, and solve various sensor network design problems individually and in teams.

IT720: Advanced Pattern Recognition

التعرف على الأنماط المتقدمة

Pattern recognition is the foundation of artificial intelligence, machine perception, computer graphics and many other related research areas, such as data mining, hypermedia, etc. The course

objective is to convey advance knowledge from pattern recognition with emphasis on the pattern recognition based on multidimensional statistical models and applications mostly in information technology

IT721: Cyber Security: Concept, Theory and Practice

الأمن عبر الإنترنت: المفهوم والنظرية والتطبيق

The course covers the following topics: 1) the purpose and function of cybersecurity technology identifying the tools and systems that reduce the risk of data breaches while enabling vital organization practices. (Cybersecurity functions) 2) Implement systems, apply tools, and use concepts to minimize the risk to an organization's cyberspace to address cybersecurity threats. (Tools and threats) 3) Use a risk management approach for responding to and recovering from a cyber-attack on system that contains high value information and assets such as an email system. (Response and risks) 4). Develop policies and procedures needed to respond and remediate a cyber-attack on a credit card system and describe plan to restore functionality to the infrastructure. (Policies and procedures).

IT722: Internet of Things

إنترنت الأشياء

The course covers the following topics: 1) Design various domains, key components, and architectural frameworks and then interface sensors and actuators for signal processing within an IoT burglar alarm system. (IoT system design and development) 2) Use wireless sensors within an ad-hoc networks architecture to capture data within a multimedia system. (Wireless data acquisition) 3) Evaluate the successful relevant applications for an IoT system using intelligent information processing and automatic control systems. (IoT system evaluation)

IT723: Research Seminars in Information Technology - II

الحلقات البحثية في تكنولوجيا المعلومات - II

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

IT724: Advanced Topics in Information Technology - II

موضوعات متقدمة في تكنولوجيا المعلومات - II

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of Information Technology. Topics chosen for study will be by arrangement with the department.

المحتوى العلمي لمقررات قسم بحوث العمليات ودعم القرار

توصيف مقررات دبلوم الدراسات العليا فى تخصص بحوث العمليات ودعم القرار

DS511: Computer Simulation Techniques

تقنيات محاكاه الحاسب

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

DS512: Scheduling Techniques

تقنيات الجدولـــــــه

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

DS513: Decision and Game Theory

نظرية القرارات والمباريات

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

DS514: Computational intelligence in Operations Research and Decision support

الحسابات الذكية في بحوث العمليات ودعم القرار

This course will cover the three main components of computational intelligence: namely evolutionary, fuzzy, neural computation. An emphasis will be made on the application of

computational intelligence (CI) techniques to optimization, prediction and modeling. Related techniques such as Ant Algorithms, genetic algorithms, neural networks, tabu search, simulated annealing may also be covered. The advantages and limitations as well as the guidelines for selecting the most efficient approach for various types of problems will be addressed. The implementation of CI techniques for various problems will be stressed throughout the course.

DS515: Non-linear and Dynamic Programming

البرمجة الغير خطيه والديناميكية

This course includes methods and algorithms for unconstrained nonlinear optimization, nonlinear optimization, Characteristics of Dynamic Programming, deterministic and non-deterministic (DP), Concepts of multistage decision-making, recursive equations, forward and backward recursion.

DS516: Techniques for Decision support systems

اساليب نظم دعم القرار

This course includes Problem solving, decision-making process , model building , types of computer based information systems , system development life cycle (SDLC) , systems analysis and design methodologies and computer based decision support systems , Classification of models included in Decision Support Systems (DSS), Principle components of an integrated DSS, Data management versus Model Management Systems, Model selection, integration, execution and interpretation functions.

DS517: Linear and integer programming

الأمثلة الخطية وغير الخطية

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, Transportation problem, Transshipment problem, Knapsack problem, Traveling salesman problem, Assignment Models, Cutting plane technique, Branch and Bound technique, Enumeration technique.

DS518: Selected Topics in Operations Research and Decision Support

موضوعات مختارة في بحوث العمليات ودعم القرار

Selected Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of Operations Research and Decision Support. Topics chosen for study will be by arrangement with the department.

DS530: Diploma Project

مشروع الدبلوم

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

توصيف مقررات الماجستير فى تخصص بحوث العمليات ودعم القرار

DS600: Applied Computational intelligence in operations research and Decision Support

تطبيقات الذكاء الحسابي في بحوث العمليات ودعم القرار

This course will cover the application of computational intelligence (CI) techniques to optimization, prediction and modeling. Related techniques such as Ant Algorithms, genetic algorithms, neural networks, tabu search, simulated annealing may also be covered. The advantages and limitations as well as the guidelines for selecting the most efficient approach for various types of problems will be addressed. The implementation of CI techniques for various problems will be stressed throughout the course.

DS601: Decision Theory and Analysis

تحليل ونظرية القرار

The course provides the students with a broad and comprehensive perspective on different theoretical approaches to the study of individual, group, and organizational decision making. During the course we will discuss conceptual and methodological problems related to research in decision making, as well as to the development of theories in the area of decision making. The course will be organized from micro to macro, by way of treating decision making at the level of the individual, group and organization as well as in inter organizational settings. The course also covers individual and organizational learning. Issues related specifically to leadership and decision making will also be included. Decision analysis: making justifiable, defensible decisions, elements of decision analysis models, decision making under pure uncertainty, limitations of decision making under pure uncertainty, coping with uncertainties, decision making under risk, the discovery and management of losses. Risk, the four letters word, decision's factors-prioritization and stability analysis, optimal decision making process.

DS611: Strategic, Risk, and Crisis Management

الإدارة الاستراتيجية والمخاطر وإدارة الأزمات

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

DS612: Applied Project Management

تطبيقات إدارة المشروعات

The goal of this course is to bring students' project management research and practice to a new and much more effective level. A case study approach is adopted during the course and the course will build on the Management Body of Knowledge (PMBOK). Broad topics to be covered include: the growth of project management; success, maturity, and excellence; project management methodologies; strategic planning for project management; maturity of modern project management; project portfolio management; the project office; and management support. The

course will also introduce some contemporary project management subject such as: e-projects, and intelligent project management.

DS613: Advanced Optimization

أمثلية متقدمة

This course builds upon a solid background in linear, network, non-linear. Starting with topics relating to mathematical programming, including path-following interior point methods, semi-definite and cone programming, and convex optimization, an exposition of advance concepts in multi-objective and network optimization will be made. Throughout the course, implementation issues will be addressed, including stability and convergence properties.

DS614: Advanced Stochastic Programming

برمجة عشوائية متقدمة

This course will cover different types of uncertainty models including fuzzy, stochastic and rough modeling to manage risk in decision making. The course will focus on the models and their applications in the field of decision support and operations research. Topics include modeling uncertainty in optimization problems, algorithms for stochastic programming, and advanced approximation and sampling methods.

DS615: Advanced Decision and Game Theory

نظريات القرارات والمباريات متقدمة

This course explores advanced topics in decision and game theory. Applications involving the analytic hierarchy process (AHP) and the analytic network process (ANP) for multi-criteria decision making will be studied. Also the course will cover methodologies and topics pertinent to decision making under uncertainty. With respect to game theory, determining equilibrium in competitive situations under uncertainty will be a main topic. In addition, the limitations of traditional game and decision theory and hence cover elements of agent based models and their methodological pitfalls will be explored.

DS616: Advanced Application in Modeling and Simulation

تطبيقات متقدمة في النمذجة والمحاكاة

This course will focus on studying advanced approaches to computer simulation. Topics include: recent trends in simulation methodologies, simulation techniques and languages; hybridization of simulation approaches; recent algorithms for validation and verification. Several case studies will be explored in details.

DS617: Service Science, Management and Engineering

إدارة وهندسة علوم الخدمة

This course provides an introduction to services science - a new, interdisciplinary field that combines social science, business, and engineering knowledge needed for organizations to succeed in the shift to the service and information-based economy. The course will build students' skills to address business and technical issues in a service business environment. These new skills include the ability to integrate across traditional disciplinary areas to obtain globally effective solutions.

Broad topics to be covered include: understanding services, designing the service enterprise, managing service operations, and quantitative models for service management.

DS618: Quality Management

ادارة الجـــــودة

This course includes the fundamentals of organizational effectiveness, organizational philosophy, quality systems, creating a customer focus, organizational leadership, strategic planning, human resource development and management, managing the supply chain, measures of organizational success, benchmarking, process management, lean tools and techniques, problem-solving tools and techniques.

DS619: Executive Decision Making

اتخاذ القرارات التنفيذية

This course includes Concepts and methods for making complex decisions in both business and government; identifying criteria and alternatives, setting priorities, allocating resources, strategic planning, resolving conflict, and making group decisions, Bayesian statistics and decision analysis, graphical models and strategic decision making. systems for computer–supported cooperative work (CSC, (be aware of current developments and future trends concerning intelligent systems.

DS620: Sustainability in Supply Chain Management

الاستدامة في ادارة سلسلة التوريد

This course includes Building Blocks of Supply Chain Management, Designing the Supply Chain, collaborating Across the Supply Chain, Organizational Change, Environmental Sustainability, and Financial Analysis, Sustainability throughout the Supply Chain, Social Sustainability through Innovation.

DS621: Research Seminars in Operations Research - I

الحلقات البحثية في بحوث العمليات - I

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

DS622: Advanced Topics in Operations Research - I

موضوعات متقدمة في بحوث العمليات - I

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of Operations Research. Topics chosen for study will be by arrangement with the department.

DS623: Research Seminars in Decision Support - I

الحلقات البحثية في دعم القرار - I

The course consists of formal lectures and the discussion of research papers appearing in the current

literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

DS624: Advanced Topics in Decision Support - I

موضوعات متقدمة في دعم القرار - I

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of Decision Support. Topics chosen for study will be by arrangement with the department.

توصيف مقررات الدكتوراه فى تخصص بحوث العمليات ودعم القرار

DS700: Advanced Computational intelligence in operations research and Decision Support

الذكاء الحسابي المتقدم في بحوث العمليات ودعم القرار

This course will explore recent advances topics in the field of computational intelligence that are relevant to optimization and decision support. Areas of interest include Evolutionary algorithms, meta-heuristics, and Neural Computation. Practical implementation aspects of relevant algorithms and techniques, especially in business intelligence, will also be addressed.

DS701: Advanced Decision Support Methodologies

منهجيات دعم القرار المتقدمة

Advanced Techniques of Decision Support explore advanced approaches to Problem solving, decision-making, and model building. Topics covered include Classification of models included in Decision Support Systems (DSS), Principal components of an integrated DSS, Data management versus Model Management Systems, and Model selection. Computer packages will be used as training tools for developing DSS.

DS711: Applications of Advanced Operations Research and Decision Support

تطبيقات بحوث العمليات ودعم القرار المتقدمة

The intent of this course is to further provide advanced usage and implementation tips and hints for applying the advanced operations research and decision support system techniques and models. In addition, it should help the students to efficiently and effectively think and innovate the way of implementation of such applications in the organizations to best fit its environment and provide the real value behind such models using advanced techniques in operations research and decision support.

DS712: Strategies and Planning Management

اداره التخطيط والاستراتيجيات

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

DS713: Advanced Forecasting Techniques

تقنيات التنبؤ المتقدمة

This course includes the advanced techniques of preparing sales and financial forecasts, estimate the relative error in these forecasts, hands-on approach, and transform data and information into a

competitive advantage, identify major trends in cash budgeting and cash flow planning, understand forecasting error and the impact of uncertainty participants. Software packages correlated to advanced forecasting techniques are used.

DS714: Advanced Scheduling Techniques

تقنيات الجدولة المتقدمة

This course will cover the advanced and new trends in the field of scheduling techniques and their applications in operations research and decision support.

DS715: Advanced Computer Simulation Techniques

تقنيات محاكاة الحاسب المتقدمة

This course will cover the advanced and new trends in the field of computer simulations techniques and their applications in operations research and decision support.

DS716: Advanced Decision Analysis

موضوعات متقدمة في تحليل القرار

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

DS717: Advanced Models of Operations Research and Decision Support

نماذج بحوث العمليات ودعم القرار المتقدمة

The intent of this course is to further provide advanced usage and awareness with the valid and applicable models in advanced operations research and decision support systems. In addition, it should help the students to efficiently and effectively think and innovate the implementation of such models in the organizations to best fit its environment and provide the real value behind such models using advanced techniques in operations research and decision support.

DS718: Research Seminars in Operations Research - II

الحلقات البحثية في بحوث العمليات - II

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

DS719: Advanced Topics in Operations Research - II

موضوعات متقدمة في بحوث العمليات - II

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of Operations Research. Topics chosen for study will be by arrangement with the department.

DS720: Research Seminars in Decision Support - II

الحلقات البحثية في دعم القرار - II

The course consists of formal lectures and the discussion of research papers appearing in the current literature in topics not covered by other courses. Student synthesizes their material and prepares written and oral presentations. students produce a literature survey paper and a research proposal on the specified topics. They then can execute their research with objective of producing a journal-quality paper. Topics chosen for study will be by arrangement with the department.

DS721: Advanced Topics in Decision Support - II

موضوعات متقدمة في دعم القرار - II

Advanced Topics provides an opportunity to study a topic which is not included in the existing curriculum. This course examines one or more selected current issues in the area of Decision Support. Topics chosen for study will be by arrangement with the department.