**ملحق**

**المقررات الدراسية لمرحلة**

**الدراسات العليا**

**أولاً**

**مقررات مرحلة دبلوم**

**الدراسات العليا**

**درجة الدبلوم العام في الحاسبات والمعلومات ( لغير خريجي الكلية)**

**الدبلوم العام - العام الأول (الفصل الدراسي الأول):**

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

**الدبلوم العام - العام الأول (الفصل الدراسي الثاني):**

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

**الدبلوم العام - العام الثاني (الفصل الدراسي الأول):**

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

**الدبلوم العام - العام الثاني (الفصل الدراسي الثاني):**

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

**الدبلومات المتخصصة :**

**1- دبلوم علوم الحاسب : (Computer Science)**

**الفصل الدراسي الأول :**

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

**الفصل الدراسي الثاني :**

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

1. **دبلوم نظم المعلومات الجغرافية و الإستشعار عن بعد :( GIS and RS)**

**الفصل الدراسي الأول :**

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

**الفصل الدراسي الثاني :**

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

**3- دبلوم التجارة الالكترونية : Electronic Commerce**

**الفصل الدراسي الأول :**

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

**الفصل الدراسي الثاني :**

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

**4- دبلوم نظم المعلومات : Information System) )**

**الفصل الدراسي الأول :**

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

**الفصل الدراسي الثاني :**

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

**5- تكنولوجيا المعلومات : ( Information Technology )**

**الفصل الدراسي الأول :**

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

**الفصل الدراسي الثاني :**

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

**6- دبلوم دعم اتخاذ القرار: (Decision Support)**

**الفصل الدراسي الأول :**

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

**الفصل الدراسي الثاني :**

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

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

**الفصل الدراسي الأول :**

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

**الفصل الدراسي الثاني :**

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

**8- دبلوم إدارة المشروعات: (Project Management)**

**الفصل الدراسي الأول :**

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

**الفصل الدراسي الثاني :**

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

**ثانياً**

**مقررات مرحلة الماجستير والدكتوراه**

**(1) مقررات الماجستير والدكتوراه في تخصص علوم الحاسب :**

CS 600 Advanced Analysis of Algorithms

التحليل اللوغارتمي المتقدم

CS 601 Advanced Artificial Intelligence

الذكاء الاصطناعي المتقدم

CS 602 Advanced Cryptography and Computer Security

التشفير المتقدم وحماية الحاسب الالي

CS 603 Systems Software and Operating Systems

نظم التشغيل وبرمجة النظم

CS 604 Advanced Operating Systems

نظم التشغيل المتقدمة

CS 605 Advanced Software Engineering

هندسة برمجيات متقدمة

CS 606 Advanced Topics in Computer Science (I)

موضوعات متقدمة في علوم الحاسب 1

CS 607 Advanced Topics in Computer Science (II)

موضوعات متقدمة في علوم الحاسب2

CS 609 Advanced Compiler Design

تصميم المعالجات المتقدمة

CS 610 Complexity Theory

نظرية التعقيد

CS 611 Computer Arabization

تعريب الحاسب الالي

CS 612 Computer Human Interaction Design

تصميم التفاعل الانساني مع الحاسب الالي

CS 613 Computer Systems Performance

أداء نظام الحاسب الآلي

CS 614 Evolutionary Algorithms

طرق الحساب التطوري

CS 615 Fuzzy Logic and Intelligent Systems

المنطق المشوش والأنظمة الذكية

CS 617 Machine Learning

تعليم الالة

CS 618 Neural Networks

الذكاء الإصطناعي

CS 619 Parallel Algorithm Design and Analysis

تصميم وتحليل الحساب الموازي

CS 620 Programming Language Design

تصميم لغات البرمجة

**(2) مقررات الماجستير والدكتوراه في تخصص نظم المعلومات**

IS 600 Advanced Database Design

تصميم قواعد البيانات المتقدمة

IS 601 Advanced Database Management and administration

ادارة قواعد البيانات المتقدمة

IS 602 Database Application Design and Implementation

تنفيذ وتصميم تطبيقات قواعد البيانات المتقدمة

IS 603 Advanced Information systems analysis and design

تحليل و تصميم نظم المعلومات المتقدمة

IS 604 Object-Oriented Information Systems Design and Implementation

تصميم وتنفيذ نظم المعلومات الموجهة

IS 605 Distributed Database Management System

ادارة قواعد البياتات الموزعة

IS 606 Advanced Topics in Database Systems

موضوعات متقدمة فى قواعد البيانات

IS 607 Information Retrieval

استرجـــاع المعلومات

IS 608 Data Mining and Knowledge Systems

إستخلاصالبيانات ونظم المعرفة

IS 609 Intelligent Information Systems

نظم المعلومات الذكية

IS 610 Knowledge Engineering

هندسة المعرفة

IS 611 Knowledge Management and Decision Systems

ادارة المعرفة ونظم القرارات

IS 612 Information system development methods and technologies

تكنولوجيا وطرق تطوير نظم المعلومات

IS 613 Legal and Ethical Issues in Information Systems

الأعتبارات الأخلاقية فى نظم المعلومات

IS 614 Managing Organizational information resources

إدارة موارد المعلومات

IS 615 Business Process Design and Implementation

تصميم وتطبيق إجراءات الأعمال

IS 616 Information Technology: Strategy and Management

إدارة تكنولوجيا المعلومات

IS 617 Quality Assurance of Information Systems

تأكيد جودة نظم المعلومات

IS 618 Information Risk Assessment and Security Management

إدارة تقييم مخاطر المعلومات

IS 619 Multimedia information Systems

نظم معلومات الوسائط المتعددة

IS 620 Financial Information Systems

نظم المعلومات المصرفية

IS 621 Designing and Developing Web-based Information Systems

تصميم وتطوير نظم المعلومات الشبكية

IS 622 Electronic Commerce Infrastructure

البنية التحتية للتجارة الإلكترونية

IS 623 Managing the Digital Firm

إدارة الشركات الرقمية

IS 624 Decision technologies for e-business

تكنولوجيا القرارات للأعمال الألكترونية

IS 625 E-commerce in the financial services industry

التجارة الألكترونية فى صناعة الخدمات المالية

IS 626 Technologies for B2B E-commerce

تكنولوجيا التجارة الألكترونية

IS 627 E-Business System Solution

حلول نظام العمل الألكترونى

IS 628 Information and Database System Security

أمان البيانات وقواعد المعلومات

IS 629 Information Systems Integration

تكامل نظم المعلومات

IS 630 Research Seminar in IS (I)

بحث دراسى فى نظم المعلومات 1

IS 631 Research Seminar in IS (II)

بحث دراسى فى نظم المعلومات 2

IS 632 Special Topics in Information Systems

موضوعات خاصة فى نظم المعلومات

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

GIS 600 Geographic Information Science Theories, Models and Issues

**موضوعات , نماذج , ونظريات علم المعلومات الجغرافية**

**GIS 602 Location Based Services and Web-based GIS**

**تحديد أماكن الخدمات و نظم المعلومات الجغرافية الشبكية**

**GIS 603 Spatial Data Acquisition Techniques**

**تقنيات جمع البيانات الجغرافية**

GIS 604 Advanced Geographical Visualization Techniques

**تقنيات التجسيد المرئى للمعلومات الجغرافية** **المتقدمة**

**GIS 605 Advanced Spatial Analyses and Modeling**

**التحليل والنمذجة الجغرافية المتقدمة**

GIS 606 Advanced Spatial Database Design

تصميم قواعد البيانات الجغرافية المتقدمة

GIS 607 Spatial Data Mining

**إستخلاص** البيانات الجغرافية

GIS 608 Spatial Reasoning

الإستنباط الجغرافى

GIS 609 Spatio-Temporal Data Modeling

نمذجة البيانات الجغرافية المؤقتة

GIS 610 Reasoning with Uncertainty in Spatial Information Systems

الاستنباط الغير مؤكد لنظم المعلومات الجغرافية

GIS 611 Advanced Raster Modeling

النمذجة المتقدمة للبيانات الشبكية

GIS 612  [GIS Network Modeling](http://www.utdallas.edu/~curtin/classes/GISC6379/GISC6379.html)

نمذجة الشبكات باستخدام نظم المعلومات الجغرافية

GIS 613 Geocomputation

الحسابات الجغرافية

GIS 614 Geomatics and Digital terrain modeling

نمذجة التضاريس

GIS 615 GIS Data Models and Data Structures

هياكل و نماذج البيانات الجغرافية

GIS 616 GIS-based locational Modeling

نمذجة الاماكن باستخدام نظم المعلومات الجغرافية

GIS 617 GIS-based Environmental Modeling

النمذجة البيئية باستخدام نظم المعلومات الجغرافية

**GIS 618 GIS\_ Based Spatial Decision Support Systems**

**نظم دعم القرارات الجغرافية**

[GIS 619 Advanced GIS Management and Implementation](http://www.utdallas.edu/~briggs/poec6383.html)

ادارة وتنفيذ نظم المعلومات الجغرافية المتقدمة

GIS 620 Research Seminar in GIS

حلقة بحثيه فى نظم المعلومات الجغرافية

**GIS 621 Advanced Digital Remote Sensing**

**الإستشعار عن بعد متقدم**

### GIS 622 Radar Remote Sensing

### الاستشعار عن بعد الرادارى

### GIS 623 3D Data Capture and Ground LIDAR

### تجميع البيانات باستخدام نظم الإستشعار عن بعد

GIS 624 [Applied Remote Sensing](http://www.utdallas.edu/~ffqiu/syl_rsapp.htm)

تطبيقات الإستشعار عن بعد

### GIS 625 Global Positioning System Satellite Surveying Techniques

### تحديد المواقع باستخدام الاقمار الصناعية

**GIS 626 Urban and Environmental Applications of GIS/Remote Sensing**

**التطبيقات البيئية والمدنية لنظم المعلومات الجغرافية والإستشعار عن بعد**

**GIS 627 Remote Sensing and GIS for Petroleum**

**تطبيقات** الإستشعار عن بعد ونظم المعلومات الجغرافية فى البترول

GIS 628 Research Seminar in RS

حلقة بحثيه فى الاستشعار عن بعد

GIS 629 Research Seminar in GIScience (I)

حلقة بحثيه في علم المعلومات الجغرافية 1

GIS 630 Research Seminar in GIScience (II)

حلقة بحثيه في علم المعلومات الجغرافية 2

GIS 631 Software Engineering Techniques in GIS

هندسة البرمجيات في نظم المعلومات الجغرافية

**مقررات الماجستير والدكتوراه في تخصص تكنولوجيا المعلومات (4)**

IT 601 Advanced Computer Networks

شبكات الحاسب المتقدمة

IT 602 Advanced Computer Graphics

الرسم بالحاسب المتقدم

IT 603 Advanced Virtual Reality

الواقع الإفتراضي المتقدم

IT 604 Communication Technology

تكنولوجيا الإتصالات

IT 605 Computer Forensics

مناظرات الحاسب

IT 606 Advanced Topics in Robotics and Computer Vision

موضوعات متقدمة في الإنسان الآلي والرؤيه بالحاسب

IT 607 Selected Topics in IT П

موضوعات مختارة في تكنولوجيا المعلومات 2

IT 608 Computer Interfaces

مواجهات الحاسب

IT 609 Data Compression Techniques

تقنيات ضغط البيانات

IT 610 Advanced Digital Signal Processing

معالجة الإشارات الرقمية المتقدمة

IT 611 Image Processing

معالجة الصور

IT 612 Modern Computer Architectures

معمارية الحاسب الحديث

IT 613 Advanced Multimedia Systems

نظم الوسائط المتعددة المتقدمة

IT 614 Secure Network System Design

تصميم نظام شبكة آمنة

IT 615 Selected Topics in Information Technology-І

موضوعات مختارة في تكنولوجيا المعلومات 1

IT 616 Advanced Speech Processing

معالجة الكلام المتقدمة

IT 617 Wireless and Mobile Networks

اللاسلكى والشبكات النقالة

**(5) مقررات الماجستير والدكتوراه في تخصص دعم القرار:**

DS 600 Advanced Forecasting Techniques

تقنيات تنبؤ متقدمة

DS 601 Advanced Topics in Decision Analysis

موضوعات متقدمة في تحليل القرار

DS 602 Computational Intelligence in OR and DSS

تقنيات الحسابات الذكية في بحوث العمليات ودعم إتخاذ القرار

DS 603 Crisis Management

إدارة الأزمات

DS 604 Decision Theory

نظرية القرارات

DS 605 Deterministic Operations Research

بحوث العمليات الحتمية

DS 606 Discrete System Simulation

محاكاة النظم المنفصلة

DS 607 Feasibility Study

دراسة الجدوى

DS 608 Game theory

نظرية المباريات

DS 609 Human Resource Management

إدارة الموارد البشرية

DS 610 Integer Programming

البرمجة الصحيحة

DS 611 Judgment, Choice, and Decision Analysis

تحليل الحكم, الإختيار , وتحليل القرارات

DS 612 Linear Programming

البرمجة الخطية

DS 613 Management and Organization Structures

الإدارة وهيكلة المنظومة

DS 614 Military Operations Research

بحوث العمليات العسكرية

DS 615 Modeling Techniques

تقنيات النمذجة

DS 616 Multicriteria Decision Analysis

تحليل قرار المعايير المتعددة

DS 617 Network Modeling

نمذجة الشبكات

DS 618 Non-Linear Programming

البرمجة الغير خطية

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

نظم المحاكاة للتحكم والإتصال الذكى

DS 620 Production and Inventory Systems

نظم الإنتاج والمخزون

DS 621 Project Management

إدارة المشروعات

DS 622 Quantitave Methods

الطرق الكمية

DS 623 Queuing Theory

نظرية الطوابير

DS 624 Reliability Analysis

المعولية

DS 625 Risk Management

إدارة المخاطر

DS 626 Scheduling Techniques

تقنيات الجدولة

DS 627 Stochastic Operations Research

النماذج العشوائية في بحوث العمليات

DS 628 Stochastic Processes

العمليات العشوائية

DS 629 Strategies and Planning Management

إدارة التخطيط والإستراتيجيات

DS 630 Dynamic methods

الطرق الديناميكية

DS 631 Stochastic Programming

البرمجة العشوائية

**ملحق رقـم (3)**

**محتويات المقررات الدراسية**

**المحتويات العلمية لمقررات**

**الإنسانيات والعلوم الأساسيه**

**HU100 English Language:**

**اللغة الإنجليزية**

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

**HU105 Organizational Behavior**

**السلوك التنظيمي**

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

**HU155 Report Writing and Presentation skills**

**كتابة التقارير و مهارات العرض**

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

**HU200 Fundamentals of Economics and Feasibility Studies**

**أساسيات الإقتصاد ودراسات الجدوى**

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

**HU250 Human Rights and IT Ethics:**

**حقوق الإنسان وأخلاقيات المهنة**

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

**BS 110 Mathematics**

**الرياضيات**

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

# BS 125 Applied Statistics and Probability

**الإحصاء و الإحتمالات التطبيقية**

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

**BS 150 Discrete Mathematics**

**الرياضيات غير المتصلة**

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

# BS 200 Numerical Computing

**الحسابات الرقمية**

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

**المحتويات العلمية لمقررات القسم العلمى**

**علوم الحاسب**

**المحتوى العلمى لمواد مرحلة البكالوريوس فى تخصص علوم الحاسب:**

**CS 120 Introduction to Computers**

**مقدمة في الحاسب**

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

**CS 150 Structured Programming**

البرمجة الهيكلية

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

**CS 200 Data Structures**

**هياكل البيانات**

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

**CS 250 Object Oriented Programming**

**البرمجة الشيئية**

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

**CS 255 Analysis and Design of Algorithms**

**تحليل و تصميم الخوارزميات**

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

**CS260 Operating Systems**

**نظم التشغيل**

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

**CS 300 Artificial Intelligence**

**الذكاء الإصطناعي**

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

**CS 350 Formal Languages and Automata**

**اللغات الصورية ونظرية الآليات**

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

**CS 400 Advanced Operating systems**

**نظم تشغيل متقدمة**

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

**CS405 Compiler Design**

**تصميم المترجمات**

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

**CS415 Computational Intelligence**

**الذكاء الحسابي**

Introducing concepts, models, algorithms, and tools for development of intelligent systems. Example topics include artificial neural networks, genetic algorithms, fuzzy systems, swarm intelligence, and hybridizations of the above techniques. This course contains Basic Concepts, Single-Layer Perceptrons as Classifiers, Multi-Layer Feedforward Networks, Single-Layer Feedback Networks, Associative Memories, Self-Organizing Networks, Genetic Algorithms, Swarm Intelligence, Fuzzy Logic, Fuzzy Neural Networks, Radial Basis Function Neural Networks, The Power and Computational Complexity of Neural Networks, Computational Intelligence and Knowledge, A Representation and Reasoning System, Using Definite Knowledge, Searching, Representing Knowledge, Knowledge Engineering, Beyond Definite Knowledge, Actions and Planning, Assumption-Based Reasoning, Using Uncertain Knowledge, Learning, Building Situated Robots, The Prolog Programming Language, Some More Implemented Systems. Recent correlated software packages should be used through labs.

**CS 420 Selected Topics in Computer Science**

**موضوعات مختارة في علوم الحاسب**

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

**CS 455 Parallel Processing**

**المعالجة على التوازى**

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

**CS 460 Theory of Computation**

**نظرية الحسابات**

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

**CS465 Human-Computer Interaction Design**

**التفاعل بين الإنسان و الكمبيوتر**

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

**CS 470 Computer Systems Security**

**نظم أمان الكمبيوتر**

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

**CS 475 Selected Topics in Computer Science**

**موضوعات مختارة في علوم الحاسب**

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

**CS 450 Project**

**المشروع**

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

**المحتوى العلمى لمواد الماجستير والدكتوراه فى تخصص علوم الحاسب**

**CS 600 Advanced Analysis of Algorithms**

**التحليل اللوغارتمي المتقدم:**

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

**CS 601 Advanced Artificial Intelligence**

**الذكاء الاصطناعي المتقدم :**

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

**CS 602 Advanced Cryptography and Computer Security**

**التشفير المتقدم وحماية الحاسب الالي:**

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

**CS 604 Advanced Operating Systems**

**نظم التشغيل المتقدمة:**

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

**CS 606 Advanced Topics in Computer Science (I)**

**موضوعات متقدمة في علوم الحاسب 1**

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

**CS 607 Advanced Topics in Computer Science (II)**

**موضوعات متقدمة في علوم الحاسب2**

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

**CS 608 Advanced Compiler Design**

**تصميم المعالجات المتقدمة :**

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

**CS 609 Complexity Theory**

**نظرية التعقيد :**

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

**CS 610 Computer Arabization**

**تعريب الحاسب الآلي :**

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

**CS 611 Computer Human Interaction Design**

**تصميم التفاعل الإنساني مع الحاسب الالي:**

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

**CS 612 Computer Systems Performance**

**أداء نظام الحاسب الالي :**

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

**CS 613 Evolutionary Algorithms**

**طرق الحساب التطوري :**

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

**CS 614 Fuzzy Logic and Intelligent Systems**

**المنطق المشوش والأنظمة الذكية :**

Fuzzy Set and Fuzzy Logic: motivation, possibilistic interpretation, basic concepts, set operations, fuzzy relations, and fuzzy inferences. Fuzzy Logic Applications: approximate reasoning, fuzzy arithmetic, linguistic models, decision theory, classification, and fuzzy controllers (development, tuning, compilation, deployment). Computational Intelligence (CI): hybrid systems based on fuzzy, neural and evolutionary computation. Case studies of real-world industrial and financial applications . Recent correlated software packages should be used through labs.

**CS 615 Machine Learning**

**تعليم الالة :**

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

**CS 616 Neural Networks**

**الشبكات العصبية**

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

**CS 617 Parallel Algorithm Design and Analysis**

**تصميم وتحليل الحساب الموازي :**

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

**CS 618 Programming Language Design**

**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. Recent correlated software packages should be used through labs.

**المحتويات العلمية لمقررات القسم العلمى**

**نظم المعلومات**

**المحتوى العلمى لمواد مرحلة البكالوريوس فى تخصص نظم المعلومات :**

**IS 150 Computer Skills for Personal Productivity**

**مهارات الكمبيوتر**

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

**IS 200 Fundamentals of Information Systems**

**أساسيات نظم المعلومات**

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

**IS 250 Database Concepts**

**مفاهيم قواعد البيانات**

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

**IS 300 Database Management Systems**

**نظم إدارة قواعد البيانات**

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

**IS 305 Systems Analysis and Design (І)**

**تحليل وتصميم النظم (1)**

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

**IS 350 Systems Analysis and Design (П)**

**تحليل وتصميم النظم (2)**

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

**IS 355 Expert Systems and Decision Support Systems**

**النظم الخبيرة ونظم دعم القرار**

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

**IS 400 e-Business System Strategy**

**إستراتيجية نظم الأعمال الإلكترونية**

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

**IS 405 Distributed and Mobile Database**

**نظم قواعد البيانات الموزعة و المحمولة**

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

**IS 410 Information Security**

**أمان البيانات**

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

**IS 415 Information Services Management**

**إدارة خدمات المعلومات**

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

**IS 420 Selected Topics in IS**

**موضوعات مختارة في نظم المعلومات**

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

**IS450 Project**

**المشروع**

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

**IS 455 Data Mining and Knowledge Discovery**

**إستخلاص البيانات وإكتشاف المعرفة**

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

**IS 460** **Multimedia Information Systems & Digital Libraries**

**نظم معلومات الوسائط المتعددة و المكتبات الرقمية**

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

**IS 465 e-Business Technologies**

**تكنولوجيا الأعمال الإلكترونية**

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

**IS 470 Object Oriented Databases**

**قواعد البيانات الموجهه**

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

**IS 475 Selected Topics in IS**

**موضوعات مختارة في نظم المعلومات**

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

**المحتوى العلمى لمواد الدبلومات فى تخصص نظم المعلومات :**

**GDIS 510 Systems Analysis and Design**

**تحليل وتصميم النظم**

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

**GDIS 555 E-Commerce**

**التجارة الإلكترونية**

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

**IS 500 Management of Information Systems**

**إدارة نظم المعلومات**

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

**IS 501 Information Systems Analysis and Design**

**تحليل وتصميم النظم**

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

**IS 502 Business Data Communications**

**بيانات الأعمال تراسل**

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

**IS 503 Database Design**

**تصميم قواعد بيانات**

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

**IS550 Project**

**المشروع**

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

**IS 551 Database Management and Administration**

**إدارة قواعد البيانات**

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

**IS 552 Expert Systems and Decision Support Systems**

**النظم الخبيرة ونظم دعم القرارات**

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

**IS 553 Information Security**

**أمان المعلومات**

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

**IS 554 Selected Topics in IS**

**موضوعات مختارة فى نظم المعلومات**

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

**المحتوى العلمى لمواد الدبلومات فى تخصص التجاره الإلكترونيه:**

**EC 500 An E-Commerce Introduction**

**مقدمة في التجارة الإلكترونية**

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

**EC501 Web Technology: Servers and Software**

**تكنولوجيا الإنترنت**

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

**EC 502 Web Programming**

**برمجة الإنترنت**

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

**EC 503 Object Structures Analysis and Logical Design**

**تحليل وتصميم منطقى لهياكل الكائنات**

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

**EC 550 Project**

**المشروع**

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

**EC551 Telecommunication and Web Security**

**نظم الإتصالات وأمان الشبكات**

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

**EC 552 DBMS: Physical Design and Implementation**

**التصميم والتطبيق الفعلى لنظم إدارة قواعد البيانات**

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

**EC 553 Project Management for Web Projects**

**إدارة مشروعات الشبكة**

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

**EC554 Selected Topics in E-Commerce**

**موضوعات مختارة في التجارة الإلكترونية**

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

**EC 550 Project**

**المشروع**

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

**المحتوى العلمي لمواد الماجستير والدكتوراه فى تخصص نظم المعلومات :**

**IS 600 Advanced Database Design**

**تصميم قواعد البيانات المتقدمة**

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

**IS 601 Advanced Database Management and Administration**

**إدارة قواعد البيانات المتقدمة**

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

**IS 602 Database Application Design and Implementation**

**تنفيذ وتصميم تطبيقات قواعد البيانات المتقدمة**

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

**IS 603 Advanced Information systems analysis and design**

**تحليل و تصميم نظم المعلومات المتقدم**

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

**IS 604 Object-Oriented Information Systems Design and Implementation**

**تصميم وتنفيذ نظم المعلومات الموجهة**

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

**IS 605 Distributed Database Management System**

**إدارة قواعد البيانات الموزعة**

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

**IS 606 Advanced Topics in Database Systems**

**موضوعات متقدمة فى قواعد البيانات**

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

**IS 607 Information Retrieval**

**إسترجـــاع المعلومات**

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

**IS 608 Data Mining and Knowledge Systems**

**إستخلاص البيانات ونظم المعرفة**

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

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

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

**IS 609 Intelligent Information Systems**

**نظم المعلومات الذكية**

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

**IS 610 Knowledge Engineering**

**هندسة المعرفة**

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

**IS 611 Knowledge Management and Decision Systems**

**إدارة المعرفة ونظم القرارات**

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

**IS 612 Information system development methods and technologies**

**تكنولوجيا وطرق تطوير نظم المعلومات**

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

**IS 613 Legal and Ethical Issues in Information Systems**

**الإعتبارات الأخلاقية في نظم المعلومات**

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

**IS 614 Managing Organizational information resources**

**إدارة موارد المعلومات**

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

**IS 615 Business Process Design and Implementation**

**تصميم وتطبيق إجراءات الأعمال**

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

**IS 616 Information Technology: Strategy and Management**

**إدارة تكنولوجيا المعلومات**

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

**IS 617 Quality Assurance of Information Systems**

**تأكيد جودة نظم المعلومات**

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

**IS 618 Information Risk Assessment and Security Management**

**إدارة تقييم مخاطر المعلومات**

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

**IS 619 Multimedia information Systems**

**نظم معلومات الوسائط المتعددة**

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

**IS 620 Financial Information Systems**

**نظم المعلومات المصرفية**

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

**IS 621 Designing and Developing Web-based Information Systems**

**تصميم وتطوير نظم المعلومات الشبكية**

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

**IS 622 Electronic Commerce Infrastructure**

**البنية التحتية للتجارة الألكترونية**

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

**IS 623 Managing the Digital Firm**

**إدارة الشركات الرقمية**

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

**IS 624 Decision technologies for e-business**

**تكنولوجيا القرارات للأعمال الألكترونية**

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

**IS 625 E-commerce in the financial services industry**

**التجارة الإلكترونية في صناعة الخدمات المالية**

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

**IS 626 Technologies for B2B E-commerce**

**تكنولوجيا التجارة الألكترونية**

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

**IS 627 E-Business System Solution**

**حلول نظام العمل الألكترونى**

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

**IS 628 Information and Database System Security**

**أمان المعلومات وقواعد البيانات**

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

**IS 629 Information Systems Integration**

**تكامل نظم المعلومات**

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

**IS 630 Research Seminar in IS (I)**

**بحث دراسى فى نظم المعلومات 1**

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

**IS 631 Research Seminar in IS (II)**

**بحث دراسى فى نظم المعلومات 2**

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

**IS 632 Special Topics in Information Systems**

**موضوعات خاصة فى نظم المعلومات**

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

**المحتوى العلمى لمواد مرحلة البكالوريوس فى تخصص نظم المعلومات الجغرافية والإستشعار عن بعد**

**GIS 300 Principles of Geographic Information Systems**

**مبادئ نظم المعلومات الجغرافية**

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

**GIS 400 GeoDatabase Design**

**تصميم قواعد البيانات الجغرافية**

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

**GIS 405 Digital Cartography and Visualization**

**الكارتوجرافيا الرقمية والتجسيد المرئى**

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

**GIS 410 Spatial Data Acquisition Techniques and Quality Standards**

**تقنيات جمع البيانات الجغرافية ومراقبة الجوده**

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

**GIS 415 Principles of Remote Sensing**

**مبادئ الإستشعار عن بعد**

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

**GIS 420 Selected Topics in GIS/RS**

**موضوعات مختارة في نظم المعلومات الجغرافية والإستشعار عن بعد**

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

**GIS 455 Spatial Analyses and Modeling Using GIS**

**التحليل والنمذجة باستخدام نظم المعلومات الجغرافية**

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

**GIS 460 GIS Programming and Customization**

**برمجة نظم المعلومات الجغرافية**

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

**GIS 465 Web-based GIS**

**نظم المعلومات الجغرافية الشبكية**

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

[**GIS 470 GIS Management and Implementation**](http://www.utdallas.edu/~briggs/poec6383.html)

**إدارة وتنفيذ نظم المعلومات الجغرافية**

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

**GIS 475 Selected Topics in GIS/RS**

**موضوعات مختارة في نظم المعلومات الجغرافية والإستشعار عن بعد**

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

**GIS 450 Project**

**المشروع**

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

**المحتوى العلمي لمواد الدبلومات فى تخصص نظم المعلومات الجغرافية والإستشعار عن بعد**

**GIS 500 Fundamentals of Geographic Information Systems**

**أساسيات نظم المعلومات الجغرافية**

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

**GIS 505 Fundamentals of Remote Sensing**

**أساسيات الإستشعار عن بعد**

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

**GIS 510 Spatial Data Acquisition Techniques and Quality Control**

**تقنيات جمع البيانات الجغرافية ومراقبة الجوده**

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

**GIS 515 Visualization of Geographic Information**

**التجسيد المرئى للمعلومات الجغرافية**

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

**GIS 555 Advanced Spatial Analysis and Modeling**

**التحليل والنمذجة الجغرافية المتقدمة**

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

**GIS 560 Selected Topics in GIS**

**موضوعات مختارة فى نظم المعلومات الجغرافية**

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

**GIS 565 GIS Management and Implementation**

**إدارة وتنفيذ نظم المعلومات الجغرافية**

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

**GIS 570 Selected Topics in RS**

**موضوعات مختارة في الإستشعار عن بعد**

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

**GIS 550 Project**

**المشروع**

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

**المحتوى العلمي لمواد الماجستير والدكتوراة فى تخصص نظم المعلومات الجغرافية والإستشعار عن بعد**

**GIS 600 Geographic Information Science Theories, Models and Issues**

**موضوعات، نماذج، و نظريات علم المعلومات الجغرافية**

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

**GIS 601 Advanced Topics in GIS**

**موضوعات متقدمة فى نظم المعلومات الجغرافية**

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

**GIS 602 Location Based Services and Web-based GIS**

**تحديد أماكن الخدمات و نظم المعلومات الجغرافية الشبكية**

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

**GIS 603 Spatial Data Acquisition Techniques**

**تقنيات جمع البيانات الجغرافية**

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

**GIS 604 Advanced Geographical Visualization Techniques**

**طرق التجسيد المرئى لنظم المعلومات الجغرافية المتقدمة**

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

**GIS 605 Advanced Spatial Analyses and Modeling**

**التحليل والنمذجة الجغرافية المتقدمة**

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

**GIS 606 Advanced Spatial Database Design**

**تصميم قواعد البيانات الجغرافية المتقدمة**

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

**GIS 607 Spatial Data Mining**

**إستخلاص البيانات الجغرافية**

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

**GIS 608 Spatial Reasoning**

**الإستنباط الجغرافى**

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

**GIS 609 Spatio-Temporal Data Modeling**

**نمذجة البيانات الجغرافية المؤقتة**

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

**GIS 610 Reasoning With Uncertainty in Spatial Information Systems**

**الاستنباط الغير مؤكد لنظم المعلومات الجغرافية**

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

**GIS 611 Advanced Raster Modeling**

**النمذجة المتقدمة للبيانات الشبكية**

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

**GIS 612**  [**GIS Network Modeling**](http://www.utdallas.edu/~curtin/classes/GISC6379/GISC6379.html)

**نمذجة الشبكات باستخدام نظم المعلومات الجغرافية**

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

# GIS 613 Geocomputation

**الحسابات الجغرافية**

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

**GIS 614 Geometrics and Digital terrain modelling**

**نمذجة التضاريس**

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

**GIS 615 GIS Data Models and Data Structures**

**هياكل و نماذج البيانات الجغرافية**

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

**GIS 616 GIS-based locational Modeling**

**نمذجة الاماكن باستخدام نظم المعلومات الجغرافية**

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

**GIS 617 GIS-based Environmental Modeling**

**النمذجة البيئية باستخدام نظم المعلومات الجغرافية**

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

**GIS 618 GIS-Based Spatial Decision Support Systems**

**نظم دعم القرارات الجغرافية**

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

[**GIS 619 Advanced GIS Management and Implementation**](http://www.utdallas.edu/~briggs/poec6383.html)

**ادارة وتنفيذ نظم المعلومات الجغرافية المتقدمة**

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

**GIS 620 Research Seminar IN GIS**

**حلقة بحثيه فى نظم المعلومات الجغرافية**

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

**GIS 621 Advanced Digital Remote Sensing**

**الإستشعار عن بعد المتقدم**

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

### GIS 622 Radar Remote Sensing

### الاستشعار عن بعد الرادارى

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

**GIS 623 3D Data Capture and Ground LIDAR**

**تجميع البيانات باستخدام نظم الاستشعار عن بعد**

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

**GIS 624** [**Applied Remote Sensing**](http://www.utdallas.edu/~ffqiu/syl_rsapp.htm)

**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. Recent correlated software packages should be used through labs.

### GIS 625 Global Positioning System Satellite Surveying Techniques

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### تحديد المواقع باستخدام الاقمار الصناعية

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

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**GIS 626 Urban and Environmental Applications of GIS/Remote Sensing**

**التطبيقات البيئية و المدنية لنظم المعلومات الجغرافية و الاستشعار عن بعد**

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

**GIS 627 Remote Sensing and GIS for Petroleum**

**تطبيقات الاستشعار عن بعد و نظم المعلومات الجغرافية فى البترول**

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

**GIS 628 Research Seminar in RS**

**حلقة بحثيه فى الاستشعار عن بعد**

Provides faculty supervision of research conducted by a student.

**GIS 629 Research Seminar in GIScience (I)**

**حلقة بحثيه فى علم المعلومات الجغرافية1**

Provides faculty supervision of research conducted by a student.

**GIS 630 Research Seminar in GIScience (II)**

**حلقة بحثيه فى علم المعلومات الجغرافية2**

Provides faculty supervision of research conducted by a student.

**المحتويات العلمية لمقررات القسم العلمى**

**تكنولوجيا المعلومات**

**المحتوى العلمى لمواد مرحلة البكالوريوس في تخصص تكنولوجيا المعلومات**

**IT100 Electronic Physics**

**الإلكترونيات فيزياء**

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

**IT 150 Digital Logic Design**

**التصميم المنطقي**

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

IT 200 Computer Architectures and Assembly Language

**معمارية الحاسب ولغة التجميع**

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

IT 300 Computer Graphics

**الرسم بالحاسب**

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

**IT 305 Computer Networks**

**شبكات الحاسب**

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

IT 350 Multimedia Systems

**الوسائط المتعددة**

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

## **IT 355 Internet Technologies & Programming**

**تكنولوجيا الإنترنت و برمجتها**

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

**IT 400 Computer Animation**

**الرسومات المتحركة**

Kinematics and techniques for character animation. Topics include physical  
modeling and simulation, motion planning, control and learning algorithms,  
locomotion, motion trajectory optimization, scripting languages, motion capture  
and motion editing. Students will implement algorithms and interactive  
animation tools. Recent correlated software packages should be used through labs. Recent correlated software packages should be used through labs.

**IT 405 Digital Signal Processing**

**معالجة الإشارات الرقمية**

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

**IT 410 Wireless & Mobile Networks**

**الشبكات اللاسلكية و المحمولة**

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

**IT 415 Virtual Reality**

**الواقع الإفتراضي**

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

**IT 420 Selected Topics In IT**

**موضوعات مختارة في تكنولوجيا المعلومات**

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

**IT 455 Computer Interfacing**

**مواجهات الحاسبات**

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

**IT 460 Network Security**

**أمان الشبكات**

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

**IT 465 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. Recent correlated software packages should be used through labs.

**IT 470 Robotics**

**الإنسان الآلي**

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

**IT 450 Project**

**المشروع**

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

**المحتوى العلمى لمواد الدبلومات في تخصص تكنولوجيا المعلومات**

**IT 551 Communication Technology**

**تكنولوجيا الإتصالات**

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

**IT 552 Advanced Computer Architecture.**

**عمارة الحاسب المتقدمة**

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

**IT 554 Digital Signal Processing**

**معالجة الإشارات الرقمية**

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

**IT 500 Data Compression**

**ضغط البيانات**

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

**IT 501 Advanced Computer and Communication Network**

**الحاسب وشبكات الإتصالات المتقدمة**

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

**IT 503 Pattern Recognition**

**التعرف على الأنماط**

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

**IT 550 Project:**

**المشروع**

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

**المحتويات العلمية لمقررات القسم العلمى**

**دعم القرار**

**المحتوى العلمى لمواد مرحلة البكالوريوس فى تخصص دعم إتخاذ القرار**

**DS 150 Fundamentals of Management**

**أساسيات الإدارة**

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

**DS 200 Operation Research:**

**بحوث العمليات**

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

**DS 250 Project Management**

**إدارة المشروعات**

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

**DS 350 Computer Simulation Technique :**

**المحاكاة بالحاسب**

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

**DS 400 Advanced Project Management**

**إدارة مشروعات متقدمه:**

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

**DS 405 Decision and Game Theory**

**نظرية المباريات والقرارات**

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

**DS 410 Stochastic Models in Operations Research and Decision Support**

**النماذج العشوائيه فى بحوث العمليات ودعم القرار**

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

**DS 415 Inventory Control and Production Management :**

**مراقبة المخازن و إدارة الإنتاج**

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

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

**موضوعات مختارة في بحوث العمليات ودعم اتخاذ القرار**

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

**DS 455 Strategic and Crisis Management :**

**الإدارة الإستراتيجية و إدارة الأزمات**

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

**DS 460 Decision and Risk Management :**

**القرار وإدارة المخاطر**

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

**DS 465 Multi-objective Programming :**

**البرمجة متعددة الأهداف**

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

**DS 470 Computational Intelligence in Operations Research and Decision Support:**

**الذكاء الحسابى في بحوث العمليات ودعم إتخاذ القرار**

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

**DS 450 Project :**

**المشروع**

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

**المحتوى العلمى لمواد الدبلومات فى تخصص دعم إتخاذ القرار**

**DS 500 Computer Simulation Techniques**

**تقنيات الحاسب للمحاكاة**

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

**DS 501: Scheduling Techniques**

**تقنيات الجدولة**

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

**DS 502 Decisions and Game Theory:**

**نظرية المباريات والقرارات**

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

**DS 503 Seminar in Stochastic Operation Research:**

**مقاله فى بحوث العمليات العشوائيه**

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

**DS 551Computational Intelligence application in Operation Research:**

**الذكاء الحسابى في بحوث العمليات ودعم إتخاذ القرار**

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

**DS 552 Computer Application in Operations Research and Decision Support Systems**

**تطبيقات الحاسب فى بحوث العمليات وإتخاذ القرار:**

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

**DS 553 Strategic, Risk, and Crisis Management:**

**الإدارة الإستراتيجية, إدارة المخاطر, وإدارة الأزمات**

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

**DS 554 Linear and Nonlinear Modeling:**

**النمذجة الخطية وغير الخطية**

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

**DS 550 Project**

**المشروع**

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

**المحتوى العلمى لمواد الدبلومات فى تخصص إدارة المخاطر**

**DS 510 Risk Assessments, Analysis and Evaluation:**

**تقييم المخاطر, وتحليلها**

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

**DS 511 Risk Treatment: Risk Control:**

**مقاومة المخاطر والتعامل معها**

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

**DS 512 Occupational Safeties and Health:**

**الصحة والسلامة المهنية**

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

**DS 513 Quantitative Risks and Modeling:**

**النمذجة والمخاطر الكمية**

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

**DS 561 Risk Technology Strategies:**

**تقنيات وخطط المخاطر**

This course' content is historical development of standards and codes of practice and their applications, use of design principles to prevent loss, risk management simulations and applications, application of standards and codes, development of skills and techniques to identify and control particular hazards endemic to human and property loss. Recent correlated software packages should be used through labs.

**DS 652 Industrial Environments and HR in Risk:**

**البيئات الصناعية والموارد البشرية في المخاطر**

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

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**DS 563 Business Continuity and Crisis Management:**

**إستمرارية العمل وإدارة الأزمات**

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

**DS 564 Risk Management**

**إدارة المخاطر**

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

**DS Project**

**المشروع**

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

**المحتوى العلمى لمواد الدبلومات فى إدارة المشروعات**

**DS 520 Introduction to Project Management**

**مقدمه فى إدارة المشروعات**

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

**DS 521 Communication skills**

**مهارات الإتصال**

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

**DS572 Math for Project Management**

**الرياضيات في إدارة المشروعات**

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

**DS 523 Projects Planning and Scheduling**

**تخطيط وجدولة المشروعات**

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

**DS 571 Human Relations and Behavior**

**سلوكيات الموارد البشريه**

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

**DS 522 Feasibility Study** **of Projects**

**دراسة الجدوى للمشروعات**

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

**DS 573 Computer Application in Project Management**

**تطبيقات الحاسوب فى إدارة المشروعات**

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

**DS 574 Project Management and Contracts**

**إدارة المشروعات والعقود**

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

**DS 550 Project**

**المشروع**

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

**المحتوى العلمى لمواد الماجستير والدكتوراه في تخصص بحوث العمليات ودعم إتخاذ القرار**

**DS 600 Advanced Forecasting Techniques:**

**تقنيات تنبؤ متقدمة**

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

**DS 601 Advanced Topics in Decision Analysis**

**موضوعات متقدمة في تحليل القرار**

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

**DS 602 Computational Intelligent Techniques in Operations Research and Decision Support**

**تقنيات الحسابات الذكية في بحوث العمليات ودعم إتخاذ القرار**

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

**DS 603 Crisis Management:**

**إدارة الأزمات**

This course provides delegates with the capability to develop a crisis management plan and identify who should be represented on the crisis management team based on practice tools and techniques. Delegates learn how and when to invoke a crisis management plan and what immediate actions should be taken to ensure an effective recovery in the event of an incident or crisis. To identify issues relevant to the delegate’s organization, a scenario exercise is developed and run as part. Recent correlated software packages should be used through labs.

**DS 604 Decision Theory:**

**نظرية القرارات**

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

**DS 605 Deterministic Operations Research**

**بحوث العمليات الحتمية**

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

**DS 606 Discrete System Simulation**

**محاكاة النظم المنفصلة**

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

**DS 607 Feasibility Study:**

**دراسة الجدوى**

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

**DS 608 Game Theory:**

**نظرية المباريات**

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

**DS 609 Human Resource Management**

**إدارة الموارد البشرية**

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

**DS 610 Integer Programming**

**البرمجة الصحيحة**

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

**DS 611 Judgment, choice, and Decision Analysis**

**الحكمه فى إختيار وتحليل القرار**

Probabilistic modeling from data to a decisive knowledge. Decision analysis: making justifiable, defensible decisions, elements of decision analysis models, decision making under pure uncertainty, limitations of decision making under pure uncertainty, coping with uncertainties, decision making under risk, the discovery and management of losses.

Risk, the four letters word, decision's factors-prioritization and stability analysis, optimal decision making process. Recent correlated software packages should be used through labs.

**DS 612 Linear Programming**

**البرمجة الخطية**

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

**DS 613 Management and Organization Structures**

**الهياكل التنظيميه والإداره**

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

**DS 614 Military Operations Research**

**بحوث العمليات العسكرية**

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

**DS 615 Modeling Techniques:**

**تقنيات النمذجة**

The course surveys literature on spatially disaggregated (fine-scale) empirical models of land-use change (LUC). The course will begin with a discussion of factors that are hypothesized to drive land-use change across multiple spatial, institutional, and human scales and a discussion of issues related to LUCC modeling. The bulk of the course will be spent reviewing techniques for land-use modeling, including statistical and regression models, cellular automata, mathematical programming and other optimization models, students should be able to critically review and interpret a land-use model, whether presented in a report or scholarly article. They should have an understanding of the input data requirements, the ways in which the model output can be used, the spatial, temporal, and human scale over which the model operates, the disciplinary scope of the model, and the strengths, weaknesses, what empirical modeling techniques can be applied to a given data set. Finally, they should have an understanding of what modeling techniques are appropriate for particular research questions. Recent correlated software packages should be used through labs.

## **DS 616 Multicriteria Decision Analysis**

**تحليل قرار المعايير المتعددة**

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

**DS 617 Network Modeling**

**نمذجة الشبكات**

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

**DS 618 Non-linear Programming**

**البرمجه الغير خطيه**

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

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

**نظم المحاكاة للتحكم والإتصال الذكى**

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

# DS 620 Production and Inventory Systems

**نظم الإنتاج والمخزون**

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

### DS 621 Project Management

**إدارة المشروعات**

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

**DS 622 Quantitative Methods**

**الطرق الكمية**

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

**DS 623 Queuing Theory**

**نظرية الطوابير**

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

## **DS 624 Reliability Analysis**

**المعولية**

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

**DS 625 Risk Management**:

**إدارة المخاطر**

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

**DS 626 Scheduling Techniques:**

**تقنيات الجدولة**

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

**DS 627 Stochastic Operations Research**

**بحوث العمليات العشوائية**

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

**DS 628 Stochastic Processes**

**النمذجة العشوائية**

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

**DS 629 Strategies and planning management:**

**إدارة التخطيط والإستراتيجيات**

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

**DS 630 Dynamic methods**

**الطرق الديناميكية**

This course presents a mathematical modeling framework for sequential decision processes. A decision maker is to choose a sequence of actions towards an objective goal such as to minimize expected cost. At each stage his choice of action as well as events outside of his control determines the future development of the system. The difficulty that the decision maker faces consists of considering both present cost and anticipated future costs. Dynamic programming captures this tradeoff. In this course, we present a unified framework for formulating both deterministic and stochastic systems, over finite or infinite time horizon. We introduce the principle of optimality and the dynamic programming algorithm; address problem formulations, algorithmic procedures as well as questions of theoretical interest. Applications are presented throughout the course, including inventory policies, production control, financial decisions, scheduling, and engineering designs. Recent correlated software packages should be used through labs.

**DS 631 Stochastic Programming**

**البرمجة العشوائية**

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

**المحتويات العلمية لمقررات**

**مرحلة الدبلومات العامة**

**المحتوى العلمى لمواد مرحلة الدبلومات العامة**

**GDBS 500 Discrete Mathematics**

**الرياضيات غير المتصلة**

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

# GDBS 505 Applied Statistics and Probability

**الإحصاء و الإحتمالات التطبيقية**

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

**GDIS 500Computer Skills for Personal Productivity**

**مهارات الكمبيوتر للإنتاجية**

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

**GDIS 505 Fundamentals Of Information Systems**

**أساسيات نظم المعلومات**

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

**GDIT 500 Digital Logic Design**

**التصميم المنطقي**

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

**GDCS 500 Structured Programming**

**البرمجة الهيكلية**

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

**GDCS 505 Artificial Intelligence**

**الذكاء الإصطناعي**

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

**GDIS 510 Systems Analysis and Design**

**تحليل وتصميم النظم**

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

**GDCS 550 Data Structures**

**هياكل البيانات**

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

**GDCS 555 Operating Systems**

**نظم التشغيل**

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

**GDIT 550 Computer Networks**

**شبكات الحاسب**

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

**GDCS 560 Object Oriented Programming**

**البرمجة الشيئية**

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

**GDDS 550** Project Management

**إدارة المشروعات**

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

**GDIT 555 Computer Graphics and Multimedia**

**نظرية الأشكال والوسائط المتعددة**

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

**GDIS 555 Database Management Systems**

**نظم إدارة قواعد البيانات**

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

**GDIS 565 Expert Systems and Decision Support Systems**

**النظم الخبيرة ونظم دعم القرار**

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

**GDCS 500 Structured Programming**

**البرمجة الهيكلية**

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

**GDIS 550 Fundamentals of Geographic Information Systems**

**أساسيات نظم المعلومات الجغرافية**

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

**GDIS 555 E-Commerce**

**التجارة الإلكترونية**

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

**GDDS 500 Modeling and Simulation**

**النمذجه والمحاكاة**

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