الدكتوراه في نظم المعلومات

(بالرسالة وبعض المقررات)

المتطلبات العامة للبرنامج:

للحصول على درجة دكتوراه الفلسفة في تقنية المعلومات يجب أن يكمل الطالب مالا يقل عن (38) وحدة دراسية معتمدة بما فيها رسالة الدكتوراه. وتكون موزعة عل النحو الآتي:

الدرجات العلمية:

- (12) وحدة معتمدة للمقررات الإجبارية .
- (6) وحدة معتمدة للمقررات الاختيارية .
- (20) وحدات معتمدة لرسالة الدكتوراه .

أ ـ المقررات الدراسية الإجبارية (12) وحدة معتمدة :

الوحدات الدراسية	اسم المقرر	رمز ورقم المقرر	
		English	عربي
3	التحليل الكمي	CPIS 701	نما 701
3	قواعد البيانات الكبيرة وإدارة المعرفة	CPIS 702	نما 702
3	نظم المعلومات الذكية ودعم القرار	CPIS 703	نما 703
3	تطبيقات نظم المعلومات على الويب و المعتمدة علي المكان	CPIS 704	نما 704

ب ـ المقررات الدراسية الإختيارية (6) وحدة معتمدة:

يختار الطالب بتوجيه من المشرف وموافقة رئيس القسم ما مجموعه (6) وحدة معتمدة من المقررات الاختيارية التالية :

وحدات	اسم المقرر	رمز ورقم المقرر	
		En.	عربي
3	أمن السحابة والمحاكاة الإفتراضية	CPIS 720	نما 720
3	أمن المعلومات والاختراقات الحاسوبية	CPIS 721	نما 721
3	نظم دعم القرار المتقدم	CPIS 722	نما 722
3	تخطيط موارد المؤسسات المتقدم	CPIS 731	نما 731
3	إدارة جودة مشاريع نظم المعلومات	CPIS 733	نما 733
3	استراتيجيات وسياسات نظم المعلومات	CPIS 735	نما 735
3	نظم نمذجة ومحاكاة المؤسسات	CPIS 737	نما 737
3	إدارة التغيير لنظم المعلومات	CPIS 739	نما 739

ج ـ الرسالة (20) وحدات معتمدة:

بـ (تابع) المقررات الدراسية الإختيارية (6) وحدة معتمدة:

الوحدات الدراسية	اسم المقرر	رمز ورقم المقرر	
		English	عربي
20	الرسالة	CPIS 799	نما 799

وحدات	اسم المقرر	رمز ورقم المقرر	
		En.	عربي
3	مستودعات البيانات واكتشاف المعرفة	CPIS 741	نما 741
3	إدارة المعرفة للمؤسسات	CPIS 743	نما 743
3	تحليل وتصميم النظم المتقدم	CPIS 751	نما 751
3	مقاييس واقتصاديات البرمجيات	CPIS 753	نما 753
3	علوم الإدراك وتطبيقاتها المعلوماتية	CPIS 761	نما 761
3	تمثيل البيانات رسوميا	CPIS 763	نما 763
3	موضوعات متقدمة في الشبكات	CPIS 771	نما 771
3	الواقع الافتراضي	CPIS 781	نما 781
3	المعلوماتية الحيوية	CPIS 791	نما 791
3	ندوة بحث	CPIS 795	نما 795
3	مواضيع مختارة	CPIS 796	نما 796

Courses Description

Course Code	Course Title	Credits	Prerequisites
CPIS 701	**Quantitative Analysis**	3	-
Description	Quantitative analysis is dealing with data analysis in a statistical manner. Most research studies require such methods in analyzing their results. This course discusses advanced statistical methods such as: Probability, Random Variables, Expectation, Distribution Functions of Random Variables, Sampling distributions, Estimation, Hypothesis Testing, Correlation and regression, Analysis of Experiments, simulation and simulation techniques.		

Course Code	Course Title	Credits	Prerequisites
CPIS 702	**Big Data Systems and Knowledge Management**	3	-
Description	It discusses advanced topics in data modeling and database design, especially OODB and distributed DB systems. It emphasizes the concepts of OODB, implementations, current research. It also discusses the architectural models for distributed database systems (DDBS). In addition, it discusses several other advanced database systems, such as deductive, active, temporal, spatial database systems. Transaction management (in particular concurrency control), distributed reliability protocols, parallel database systems, Big data systems, mining databases …etc., are among the topics to discuss.		

Course Code	Course Title	Credits	Prerequisites
CPIS 703	**Intelligent Information Systems and Decision Support**	3	-
Description	This course discusses topics in intelligent systems at the application level, technology level, and development level: Knowledge acquisition, Knowledge representation, and knowledge Base systems, expert systems, Heuristics, Inference engines, certainty analysis. AI techniques: search, predicate logic, rules and production systems. Advanced AI techniques: fuzzy logic, Artificial Neural net, genetic algorithms, Intelligent agents, Artificial Neural networks, and Machine learning, cognitive science. Pattern matching and applications: Natural language processing and natural language interfaces, Speech recognition, Image processing. Intelligent Information Systems Applications in: e-business, e-Learning, pervasive and ubiquitous systems. Also, Robotics, Virtual Reality, DSS techniques, and Computational models.		

Course Code	Course Title	Credits	Prerequisites
CPIS 704	**Applied E-Systems and Pervasive Computing**	3	-
Description	Pervasive and Ubiquitous Systems, Mobile Services, Mobile Business, Workflow and Collaborative Work, Multimedia, Internet, Intranets, and Extranet, E-Business and e-commerce, Web technology and Languages, WWW and the Value Chain, Customer Relationship Management, Data and Transaction Security, Consumer Relationship Marketing, Trans-border EDI and Data Flows, Virtual Organizations, Knowledge Management, Global Cultural Implications for IS, Applied information systems: Hospital IS, Geographic IS, Bio-Informatics systems.		

Course Code	Course Title	Credits	Prerequisites
CPIS 720	**Cloud and Virtualization Security**	3	CPIS 704
Description	An introduction to the concepts and techniques of implementing and securing cloud computing through the use of virtualization and distributed data processing and storage. Topics include operating system virtualization, distributed network storage, distributed computing, cloud models (IAAS, PAAS, and SAAS), and techniques for securing cloud and virtual systems.		

Course Code	Course Title	Credits	Prerequisites
CPIS 721	**Cyber Information Security & Computer Forensics**	3	CPIS 720
Description	Network Management and Computer Security, Information System Security, Databases and security, Criminal Law (or Criminal Justice), Information Assurance & Security, Computer Forensics, Network Forensics, Encryption/decryption techniques, Watermarking, PKI Infrastructure, Smart credit cards security, Authentication techniques: fingerprints, face recognition, …. etc.		

Course Code	Course Title	Credits	Prerequisites
CPIS 722	**Advanced Decision Support Systems**	3	CPIS 703

Description	This course examines concepts of decision support in both automated and non-automated DSS environments. The focus is on application of decision theory, analytical modeling, and simulation techniques to solve organizational problems. Group decision support systems, executive information systems, and expert systems are also discussed.

Course Code	Course Title	Credits	Prerequisites
CPIS 731	**Advanced Enterprise Resource Planning**	3	CPIS 702

Description	This course provides a technical overview of Enterprise Resource Planning Systems and their impact on organizations. Known Systems, such as SAP and Oracle Financials will be used to illustrate the concepts, fundamentals, framework, general information technology context, the technological infrastructure, and integration of business enterprise-wide applications.

Course Code	Course Title	Credits	Prerequisites
CPIS 733	**IS Project & Quality Management**	3	CPIS 731

Description	The aim of this course is to assure the significance of the concept of quality during the process of developing software. It emphasizes on the basic concepts of software quality models all over the software development process. It introduces quality standard systems used in the field of software industry and Information Systems such as: TQM, ISO, CMM, and IEEE standards in order to assure complying with standard criteria during the process of software production, while ensuring continuous development.

Course Code	Course Title	Credits	Prerequisites
CPIS 735	**Information Systems Strategies & Policies**	3	CPIS 702

Description	It discusses strategic management and deployment of information systems and technologies (ISTs) to improve business competitiveness. Examines the role of IST strategy in enabling companies to effectively manage in the turbulent and dynamic business environments brought about by the Internet. Analyzes new business opportunities in e-commerce brought about by ISTs, including the organizational redesign that these technologies require. Considers implementation and change management issues related to IST deployment in the new environment. Focuses on drawing lessons from the experiences of leading companies that are deploying ISTs to define and support their e-commerce strategies.

Course Code	Course Title	Credits	Prerequisites
CPIS 737	**Enterprise Modeling & Simulation Systems**	3	CPIS 701

Description	It presents mathematical foundation for modeling and computer simulation and comprehensive framework for modeling and simulation integrating the various simulation approaches. It covers model formulation, simulation model execution, and the model building process with its key activities model abstraction and model simplification, as well as the organization of model libraries. It emphasizes integrating discrete event and continuous modeling approaches as well as discrete event simulation of continuous processes. It also discusses simulation execution on parallel and distributed machines and concepts for simulation model realization based on the High Level Architecture (HLA) standard of DoD.

Course Code	Course Title	Credits	Prerequisites
CPIS 739	**IS Change Management**	3	CPIS 702

Description	This course equips students with practical procedures to develop and change Information Systems. It examines the scientific methods to create an organization under advanced IS management. This course will shed some light on the management procedures of Information Systems. Upon finishing this course, students are expected to be able to develop and restructure Information Systems in any department and understand the Change Management process.

Course Code	Course Title	Credits	Prerequisites
CPIS 741	**Data Warehouses and Knowledge Discovery**	3	CPIS 702

Description	Data warehousing is to discuss techniques of storing large sets of data in multidimensional cubes according to predefined criteria to ease the retrieval and analysis. Queries and storage structures, data warehouses and knowledge discovery, and Web (queries on semi-structured data). Modern Trends in Intelligent Information Systems and DBMSs, Deductive Databases and knowledge bases, Temporal Queries and Reasoning, Active Databases, Object-Relational DBMSs.

Course Code	Course Title	Credits	Prerequisites
CPIS 743	**Organization Knowledge Management**	3	CPIS 702

Description	The aim of this course is to provide the students with the basic concepts of Knowledge Management. It equips the students with the scientific and theoretical background and practical skills required for Knowledge Management. This course also covers the characteristics of Knowledge Management, and the practical models used in Knowledge Management. It discusses the methods of collecting, classifying, deploying knowledge to serve the overall goals of the organization

Course Code	Course Title	Credits	Prerequisites
CPIS 751	**Advanced Systems Analysis and Design**	3	CPIS 704

Description	Modeling and design of software at the architectural level. Architectural styles. Basics of model-driven architecture. Object-oriented design and analysis. Iterative development and unified process. Design patterns. Design by contract. Component based design. Product families. Measurement theory and appropriate use of metrics in design. Designing for qualities such as performance, safety, security, reliability, reusability, etc. Analysis and evaluation of software architectures. Introduction to architecture definition languages. Basics of software evolution, reengineering, and reverse engineering. Case studies. Introduction to distributed system software.

Course Code	Course Title	Credits	Prerequisites
CPIS 753	**Software Metrics and Economics**	3	CPIS 704

Description	Success in software development depends on three factors: software technology, economic factors and human relations. This course emphasizes on the above factors, how to deal with them in order to direct the software development process to a success. This course also covers a variety of important concepts that influence the economics of software development such as the procedures accompanying the software development process and cost accounting with an emphasis on the various measurement criteria of applications and their development process.

Course Code	Course Title	Credits	Prerequisites
CPIS 761	**Cognitive Sciences in IS Applications**	3	CPIS 704

Description	This course describes different methodologies and theoretical contributions to questions such as mental representation, the nature of expertise, and consciousness. It focuses on a fundamental question in cognitive science research: What kind of representation must be postulated to explain human intelligence or to develop computer intelligence? Is a scientific understanding of mind possible? This course is truly interdisciplinary and is not like conventional philosophy or psychology courses as it focuses on the application on information systems.

Course Code	Course Title	Credits	Prerequisites
CPIS 763	**Data Visualization**	3	CPIS 701

Description	Principles, techniques, and practices in data, information, multivariate, and scientific visualization. Includes visualization methods, data structures, examples, and tools. In addition, it discusses mathematical/physical/perceptual principles and modeling/rendering techniques used to create, represent, display, and animate models of 3D shapes and their properties (Computer Graphics).

Course Code	Course Title	Credits	Prerequisites
CPIS 771	**Topics in Networking**	3	-

Description	Advanced network technologies and broadband communication, traffic characteristics and QoS provisioning. This course introduces advanced concepts of modern computer and telecommunication networks such as new technologies for TCP/IP, MPLS, Mobile IP, and Next Generation Internet: architecture and protocols. In addition, advanced topics such as Internetworking architectures and mobility management issues will be discussed in terms of user mobility, service continuity, and the corresponding performance analysis.

Course Code	Course Title	Credits	Prerequisites
CPIS 781	**Virtual Reality**	3	CPIS 704
Description	Virtual reality is a new trend that plays important roles in different information system domains, such as e-Learning, Medicine training, and many other domains. This course will discuss topics like: the need of virtual reality and virtual reality applications, virtual environments, implementation technologies and design techniques, 3D human-computer interaction. In addition, the course should highlight the new trends in the area of Virtual Reality.		

Course Code	Course Title	Credits	Prerequisites
CPIS 791	**Bioinformatics**	3	CPIS 701& CPIS 704
Description	Introduces biological databases and bioinformatics software. Sequence comparison algorithms and tools. Sequence analysis and molecular phylogenetic. Biomolecular 3D structure and modeling. Bioinformatics theory, tools, and techniques. Computational biology problems along both algorithmic and statistical approaches. The different methods for multiple sequence alignment, genome sequencing, comparative analysis of genome information, gene prediction, finding signals in DNA, phylogenetic analysis, protein structure prediction. Other topics covered include microarray gene expression analysis and computational proteomics.		

Course Code	Course Title	Credits	Prerequisites
CPIS 795	**Research Seminar**	3	-
Description	This course provides the required background to important theoretical and applied issues in information systems. It aims to deepen the candidate's grasp of the theories, techniques and methods commonly employed in a certain emerging area of information systems. <u>It is possible that we have many sections with different titles and contents and may have one single student (if situation mandates).</u>		

Course Code	Course Title	Credits	Prerequisites
CPIS 796	**Selected topics**	3	-
Description	This course provides the required background to important theoretical and applied issues in information systems. It should be run as a seminar and a discussion forum in which students are assigned a new topic to research and discuss. <u>It is possible that we have many sections with different titles and contents and may have one single student (if situation mandates).</u>		

Course Code	Course Title	Credits	Prerequisites
CPIS 799	**Thesis**	3	**Comprehensive Exam**

Description	A thesis/dissertation is a requirement for all Doctor of Philosophy (Ph.D.) students. It is considered as primary evidence of the student's capacity for research, independent thought and of his ability to write professionally in the language of instruction.