Courses Description for the Master of Science in Information Technology

توصيف المقررات لبرنامج ماجستير العلوم في تقنية المعلومات

IT Department
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قسم تقنية المعلومات
كلية الحاسبات وتقنية المعلومات
جامعة الملك عبد العزيز
جدة – المملكة العربية السعودية

Course Description

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 600	Internetworking	3 Units	
COURSE DESCRIPTION	This course covers advanced topics on internetworking, Internet architecture and protocols. Topics include internetworking concept, Internet architectural model, IP protocol, classfull and classless addresses, and transport and application layers protocols. This course also includes routing algorithms, routing between peers, routing within an autonomous system, mobile IP, private network interconnection, bootstrap and autoconfiguration, domain name system, and network management.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 601	OBJECT ORIENTED SOFTWARE ENGINEERING	3 UNITS	
COURSE DESCRIPTION	Building on large-scale and complex software systems from available parts with the goal of increasing return on investment, decreasing time to market, and assuring quality and reliability. The course covers the basic software component concepts, overview of advanced topics on software components and component-based software engineering from research and practice.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 602	DATABASE SYSTEMS ADMINISTRATION	3 UNITS	
COURSE DESCRIPTION	This course is intended for students who wish to specialize in database management systems or wish to practice the advanced techniques involved in optimization of data storage, database design and queries. This course covers advanced topics like physical storage and access methods, query optimization, transaction processing, concurrency control, distributed databases and object oriented databases. Designing and Creating Database, Optimal Flexible Architecture and other advanced topics in Database administration.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 603	QUANTITATIVE ANALYSIS	2 UNITS	
COURSE DESCRIPTION	This course introduces the graduate student to basic methods of empirical inquiry in the social sciences. The overwhelming majorities of studies that test hypotheses, empirically fit models, produce predictions, or estimate policy impacts are based upon some form of quantitative or statistical analysis. This course will provide a basic introduction to statistical methods for political scientists and policy analysts. The course will provide a solid foundation in statistical inference, enabling the student to become a competent producer of basic statistical research.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 630	TCP/IP PROGRAMMING	3 UNITS	CPIT 600
COURSE DESCRIPTION	TCP/IP is a very large protocol suite for internet computing and web computing. This course emphasizes on thorough high-level understanding of this protocol suite and other practical issues concerning TCP/IP today.TCP/IP Protocols and standards that are commonly used in developing such distributed systems will be covered. The course covers networking applications and their specific application protocols, and also the management protocol (SNMP). Selected advanced topics on current and evolving Internet protocols, in particular IP multicasting, differentiated services and quality of service, virtual private networks, and IPv6, will also be studied.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 631	WEB ENGINEERING	3 UNITS	CPIT 630
COURSE DESCRIPTION	Web applications are complex systems that deliver a plethora of functionality to a large number of users, and also exhibit unique behaviors and demands in terms of performance, scalability, usability, and security. Web engineering is an emerging and multidisciplinary process that is used to create quality web applications. Web Engineering introduces a structured methodology utilized in software engineering to Web development projects. This course will discuss the limits of current web technologies, the similarities and differences between web and software engineering, design, information and service architectures, content management, and testing disciplines.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 632	CLOUD COMPUTING ARCHITECTURE	3 UNITS	CPIT 630
COURSE DESCRIPTION	The course examines basic APIs used in the Cloud, including the techniques for building, deploying, and maintaining applications. We learn how to weave existing SaaS offerings into new services and how to use Hadoop, the open source implementation of MapReduce framework and RestFul Web services, to build very powerful and efficient applications. We also learn how to deal with not trivial issues in the Cloud: load balancing, caching, distributed transactions, and identity and authorization management.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 633	E-COMMERCE	3 UNITS	CPIT 630
COURSE DESCRIPTION	This course is designed to provide in-depth coverage of electronic com- merce concepts. The learner will participate in a variety of activities designed to provide familiarity with the tools and issues associated with a web-delivered commercial enterprise. The learner will plan, design, develop and test web environments designed to meet secure retail and organizational needs.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 634	INTERNET COMPUTING	3 UNITS	CPIT 630
COURSE DESCRIPTION	This course covers the basic principles and practices of distributed computing over the Internet. It focuses on the Internet as a domain for sharing resources with Grids, distributed computing with Web services, and service-oriented computing. The Internet is increasingly used as a large interconnection network for deploying distributed applications to solve challenging problems in diverse areas. Application areas include Finance and E-business, Government Services, Scientific Computing and Grids, Bioinformatics, Physics, Remote Visualization, Remote Collaboration, Multimedia applications, and File Sharing. The Internet is pandemic to modern uses of technology.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 640	ADVANCED INFORMATION SECURITY	3 UNITS	CPIT 600
COURSE DESCRIPTION	This course investigates advanced topics in cryptography. Topics include private and public key cryptosystems, cryptographic hash functions, message authentication codes, basic digital signature schemes, and user authentication. Additional topics include digital watermarking, fingerprinting, and steganography. Students will write a term paper, either theoretical based on literature or reporting a student's own implementation or experiments with a chosen cryptographic scheme. Depending on the size of the group, some or all students will give a presentation to the class.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 641	INTERNET SECURITY	3 UNITS	CPIT 640
COURSE DESCRIPTION	The course is devoted to investigate the security of networks at various protocol levels. Topics include network level security and the IPsec protocol, virtual private networks, key management and distribution, transport level security: SSL, TLS, and SSH protocols. Additional topics include wireless network security, application-specific protocols for e-mail security: PGP and S/MIME, malicious software and antivirus, intrusion detection, and firewalls: types, locations, and configurations.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 642	CRYPTOGRAPHIC ALGORITHMS	3 UNITS	CPIT 640
COURSE DESCRIPTION	The course is devoted to the review of basic cryptographic algorithms, their implementation and usage. Classical encryption techniques and those of Rivest-Shamir-Adleman and EL Gamal will be seen in depth, and an overview of several others will be presented. This course also presents authentication schemes and interactive proof protocols. Students will write a term paper, either theoretical based on literature or reporting a student's own implementation or experiments with a chosen cryptographic scheme. Depending on the size of the group, some or all students will give a presentation to the class.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 643	COMPUTER FORENSICS	3 UNITS	CPIT 640
COURSE DESCRIPTION	This course provides students with knowledge and understanding of computer forensics to know different aspects of computer crime and ways in which to uncover, protect and exploit digital evidence. It will provide a theoretical foundation for the techniques and methods needed for the extraction of information from digital devices. Students will gain exposure to the spectrum of available computer forensics tools, both hardware and software, and be able to use them to perform rudimentary investigations along with developing their own tools for special needs situations.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 644	SECURE NETWORKS	3 UNITS	CPIT 640
COURSE DESCRIPTION	This course provides students with knowledge to understand the basics of security in a networked world. It will provide students with the foundation needed to understand the problems of wired and wireless network security, perform a risk analysis to ascertain the threats and cost of an attack, and design and implement security strategies to effectively build a defense to minimize the effects of these attacks.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 645	E-SECURITY	3 UNITS	CPIT 600
COURSE DESCRIPTION	The course will focus on the technology, concepts, issues and principles that are important in the design and implementation of secure e- system. The course will examine technology for protecting such systems. It provides an in depth review of the theoretical and applied topics in e- security. Students satisfactorily completing the course will be able to formulate a security model for web environment and be able to evaluate the security models and risks of e-system. It focuses on concepts and methods associated with planning, designing, implementing, managing, and auditing security at all levels in an e-system.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 697	SELECTED ADVANCE TOPICS ON INTERNET TECHNOLOGIES	3 UNITS	CPIT 630
COURSE DESCRIPTION	Topics on current research and professional issues in internet technologies.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 692	SELECTED ADVANCE TOPICS ON NETWORKS SECURITY	3 UNITS	CPIT 640
COURSE DESCRIPTION	Topics on current research and professional issues in network security.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 694	RESEARCH METHODS	1 UNITS	
COURSE DESCRIPTION	In this course, students are introduced to: the Definition and Value of Research, Scientific Methods of Research and its Special Features, Classification of Research, How to select a topic for research? Theory and Research, Concepts, Variables and types of variables, Hypothesis Testing and Characteristics, Review of literature, Conducting a Systematic Literature Review, Theoretical Framework, Problem Definition and research Proposal, The Research Process, Ethical Issues in Research, Measurement of Concepts, Criteria for Good Measurement, Research Design, Survey research, Personal interviewing, Telephone interviewing, Intercept and interviews in malls and other high traffic areas.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 695	SEMINAR	1 UNIT	CPIT 694
COURSE DESCRIPTION	In this course, student will prepare the proposal of his/her M.Sc. thesis. The student will produce and defend their thesis outlines. The proposal will contain a more detailed description of intended research points, a detailed literature review and project plan. The student will be evaluated on their report, and viva.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 699	THESIS	3 UNITS	CPIT 695
COURSE DESCRIPTION	The Thesis is the culmination of the Masters course by applying the knowledge gained and the study methods used, to make a detailed analysis of a particular topic in an IT related field. This will involve a survey of recent developments in the field, a critical analysis of these developments and a prognosis of future developments. As part of the thesis work student will also need to produce original contribution that has been verified using scientific reasoning such as prototyping or simulation.		

CODE	COURSE TITLE	CREDITS	PREREQUISITE
CPIT 691	Applied Machine Learning	3 UNITS	CPIT 600
COURSE DESCRIPTION	This course introduces students to a wide set of practical approaches in machine learning and provides them with the knowledge and skills to apply a range of machine learning techniques to solve complex data challenges. Students will learn how to apply machine learning techniques, interpret results, evaluate performance, and iteratively tune models to solve a diverse set of problems. Practical application is emphasized over theoretical content, in which recent applications of machine learning should be presented, such as robotic, speech recognition, natural language processing, computer vision, computational finance, bioinformatics and health informatics. In the end, the course introduces the concept of deep learning.		