The University of Jordan

Master
in
Web Intelligence
Non Thesis

Department of Information Technology
King Abdullah II School for Information Technology
The University of Jordan

MASTER'S IN WEB INTELLIGENCE
Department of Information Technology
King Abdullah II School for Information Technology
The University of Jordan
(Non-Thesis Track)

Plan Number			2015	

I. **GENERAL RULES AND CONDITIONS:**
1. This plan conforms to the valid regulations of programs of graduate studies.
2. Admission in this program is for IT and Engineering graduates holding a Bachelor's degree in (ordered as follow):
   1. Business Information System.
   2. Business Information Technology.
   3. Computer Science.
   4. Computer Information System.
   5. Computer Engineering.
   6. Software Engineering.
   7. Computer Networks.
   8. Computer Graphics and Animation.
   9. Any other Information Technology related degrees.

II. **SPECIAL RULES AND CONDITIONS:**
   Students may take some prerequisite courses according to what the Department suggests.

III. **THE STUDY PLAN : Studying (33) Credit Hours as follows:**
   1. **Obligatory Courses: (24) Credit Hours:**

Course No.	Course Title	Credit hrs.	Prerequisite
1901715	Theory of Algorithms	3	-----
1902723	Database Systems	3	-----
1904701	Web Semantic	3	-----
1904710	Web Applications Security	3	-----
1904715	Business Intelligence	3	-----
1904720	Cloud Computing	3	1904701
1904725	Data Warehousing and Mining	3	1904715
1904760	Research Methodologies	3	----

   2. **Elective Courses: Studying (9) Credit hours from the following:**

Course No.	Course Title	Credit hrs.	Prerequisite
1904730	Social Networks Analysis	3	-----
1904735	Mobile Web Applications	3	1904710
1904740	Digital Forensic	3	1904710
1904705	Web Economics	3	1904701
1904745	Web Data Visualization	3	1904701
1904750	Enterprise Resource Planning Design, and Implementation	3	-----
1904755	Special Topics in Web Intelligence	3	-----
1902715	Software Verification and Validation	3	1904710

   3. **A comprehensive exam (1904798) (0 Credit hours).**

Course Description

Obligatory Courses (27 hours):

(1901715) Theory of Algorithms   (3 Credit Hours)

This course provides Strategies of algorithms synthesis and analysis. Design methodologies of classical algorithm categories such as: divide-and-conquer, greedy method, dynamic programming, search and traversal, backtracking, and branch-and-bound. Computational complexity and important theoretical results from lower-and upper-bound studies, NP-hard, and NP-complete problems will be addressed.

(1902723) Database Systems (3 Credit Hours)

Advance data modeling concepts: advance relational data modeling, object oriented data modeling, database design theory, advance relational algebra, database normalization, object oriented database design, advance query languages, advance relational SQL constructs, object oriented query languages, database integrity, concurrency control, concurrency problems, concurrency approaches, database recovery, recovery solutions and approaches, database security.

(1904701) Web Semantic (3 Credit Hours)

This course is intended to introduce the core concepts of the Semantic Web that promises to dramatically improve the current World Wide Web and its use. The main goal of the Semantic Web is to enhance the human and machine interaction by representing the data in an understandable way for the machine to mediate data and services. Semantic web covers many technologies like explicit metadata, web ontology language, resource description framework, logic and inferencing for search query formulation, and intelligent agents. The course concerns about search on the Semantic Web by covering discovery of knowledge via taxonomies, Web service based data searches and search by association. The course will cover the following Query Languages (xquery, RQL SERQL, SPARQL).

(1904710) Web Applications Security (3 Credit Hours)

Web applications security, as branch of secure software design, focuses on how to design and develop dependable and trustworthy web applications. Having completed this course the student will be able to participate in, and cooperate with, web application development teams with a goal to achieving appropriate levels of security for web products. The course covers common web vulnerabilities such as Cross-Site Scripting, Cross-site Request Forgery, SQL injection and more. It introduces students to Saltzer and Schroeder security design principles and how security can be integrated with the web application development lifecycle. Topics such as threat modeling, abuse cases and secure programming will be discussed as well.

(1904715) Business Intelligence (3 Credit Hours)

This course provides students with an advance understanding of Business Intelligence, including the processes, methodologies, infrastructure, and current practices used to transform business data into useful information and support business decision-making. We will study data mining techniques, and we will examine real-world examples and cases to place data-mining techniques in context, to develop statistical data-analytic thinking using predictive modeling, classification, regression, tree induction, probability estimation, Bayesian and memory based reasoning, unsupervised methods, clustering association, page rank, K-Nearest Neighbor, text and web mining and, neural network, genetic algorithms and visualization.

(1904720) Cloud Computing (3 Credit Hours)

The course aims to provide students with comprehensive introduction and discussion of types, architectures and models of cloud environments. Moreover, the course will give the student an insight to common security issues related to cloud computing. The Course also the cover the following topics: Types of cloud services (Platform, Infrastructure and Software), Setting ups of cloud computing environments, Service Management in Cloud Computing and extensive discussion of different case Studies on Open Source and Commercial Clouds.

(1904725) Data Warehousing and Mining (3 Credit Hours)

This course provides students with an in-depth understanding of the design and implementation of data warehousing and Big data analytics systems. It will address the opportunities and challenges of big data in academics, businesses, sciences and the Web. It will cover Data Warehouse modeling and Architecture, extraction, Translation and Loading, Query Processing and Optimization, Data Warehouse Administration and Security, Column-store and NoSQL Databases, Distributed Data Processing, Streaming Databases/Complex Event Processing, and Online Analytical Processing (OLAP) databases.

(١٩٠٤٧٦٠) Research Methodologies   (3 Credit Hours)

This course focuses on research methods in the field of Computer Science and Information Technology (IT). It covers the research process, use of research tools and techniques, writing and presentation skills to researchers. It provides an introduction with applied exercises of best practice in dealing with IT research problems in a systematic approach, evaluating background literature, adhering to ethics, documentation strategies, and communication in the form of both concise as well as detailed written reports, and oral and written communication of complex IT concepts. Several research methods will be discuss focusing on research methods specific to Computer Science and artifacts development such as Modeling; Theoretical Computer Science, Experimental Computer Science; Computer Simulation.

Elective Courses (9 hours):

(1904705) Web Economics (3 Credit Hours)
The course is intended to introduce the basic economic principles explaining the business aspects of web-based services. Also, it focuses on methods for improving & optimizing e-business applications including: web algorithm design, online auctions, user behavior analysis/mining, dynamic pricing, cloud-sourcing & economics. Case studies such as Google online advertising & Amazon's Cloud Computing will also be discussed.

(1902715)   Software Verification and Validation (3 Credit Hours)

Planning verification and validation; verification and validation techniques. Software testing: Component testing, integration testing and system testing. Testing techniques; Verification and formal methods. Critical systems validation. Transition Systems, Kripke Structure, Linear Temporal Logic (LTL), Computational Tree Logic (CTL), Binary Decision Diagrams, Modeling Real-Time Systems, Algorithms for Verifying Real Time Systems.

(1904730) Social Networks Analysis (3 Credit Hours)

This course gives a basic understanding of what social network analysis is and how it can be applied. The course will cover recent research on the structure and analysis of large social and information networks and on models and algorithms that abstract their basic properties. In this course student will learn about social networks structure and evolution, and how to practically analyze large scale network data and how to reason about it. Topics covered in this course include methods for link analysis and network community detection, diffusion and information propagation on the web, virus outbreak detection in networks, and connections with work in the social sciences and economics.

(1904735) Mobile Web Applications (3 Credit Hours)

This course will cover advanced topics for web application development such as the architecture, standards, mobile programming languages and business aspects. This course introduces the concepts, practices, and technologies to design, develop, and manage cross-platform applications running on modern mobile devices. The course will help the students to identify and use the appropriate development technologies, tools, and frameworks for mobile web development. Moreover, it will study, compare and analyze user interactions between desktop web, mobile application, and mobile web.

(1904740) Digital Forensics (3 Credit Hours)

While there is remarkable dependency on online and web applications, there is also a rapid increase in number of cyber and digital crimes. In such situation it is inevitable to have professionals equipped with the necessary knowledge and skills to discover what possible damage or digital crime has been done on computing devices and applications, when it was done, and how it was done. The aim of this course is to cover method and techniques used when investigating digital data. It will discuss technical issues in acquiring computer related evidence. The course will cover several topics such as: Incident Response in various operating systems, Web Activity Reconstruction, Email Activity Reconstruction, Windows Registry Reconstruction, Forensic tools and Network forensics.

(1904745) Web Data Visualization (3 Credit Hours)

Web Data visualization course focuses on studying algorithms and state-of-the-art techniques for creating effective visualizations capable of promoting data comprehension and analysis. The course discusses the key techniques and theory used in visualization, including data models, graphical perception, and visual encoding and interaction. Students will learn about the variety of existing approaches and systems in data visualization and develop skills in evaluating different visualization techniques as applied to particular tasks. The course also discusses visual representation methods, such as graph drawing, parallel coordinates, tree mapping, and encourages students to design new innovative visualizations and experiment their potentials on case studies of various data sources.

(1904750) Enterprise Resource Planning Design, and Implementation (3 Credit Hours)

This course is designed to provide the student with a thorough understanding of both the role that Web based Enterprise Resource Planning Systems (ERP) play in an organization and the challenging task of designing and implementing ERP systems. The hand's-on exercises, coupled with the in-class discussions of ERP, will prepare the student with the knowledge sought by most ICT industry in Jordan to develop Web based ERP system to maintain their competitive edge in the market place. The course focus will be upon ERP functionality and on business processes.

(1904755) Special Topics in Web Intelligence (3 Credit Hours)

Lectures on and study of selected topics in recent developments in Web Intelligence.