Study Plan for the Bachelor Degree in Computer Information Systems

The Bachelor Degree in Computer Information Systems/Faculty of Information Technology and Computer Sciences is granted upon the completion of the following requirements:

1. The fulfillment of the conditions stated in by the set of Instructions for Awarding the Bachelor Degree at Yarmouk University number (2) for the Year 1991 and its amendments according to the Law Governing the Granting of Scientific Degrees and Certificates at Yarmouk University No. 118 for the year 2003.
2. University requirements as mentioned before which have 27 credit hours.
3. Faculty requirements as mentioned before which have 21 credit hours.
4. The Computer Information Systems Department (CIS) requirements (86 Credit hours) distributed as follows:

Table for the number indication in the course number for the bachelor degree in the CIS department

Number	Knowledge Area
0	Basic Courses
1	Programming Languages
2	Human Computer Interaction
3	Information Networks
4	System Design and Management
5	Data and File Structures
6	Database and Information Retrieval
7	Intelligent Systems
8	System Applications & New Technologies
9	Project and Special Topics

A) Single-Major Course Requirements (86 Cr. Hrs.):
1) Obligatory Courses (56 Cr. Hrs.):

Course Number	Course Name	Credit Hours	Weekly Hours		Pre-requisite / Co-requisite
			Theory	Practical	
CIS 240	Software Engineering	3	3	0	CIS104, CS117, Co-requisite: CIS245
CIS 245	Software Engineering Lab	1	0	3	Co-requisite: CIS240
CIS 256	File Structures	3	3	0	CS250
CIS 260	Database Systems	3	3	0	CS117
CIS 281A	Multimedia Systems	3	3	0	CIS104, Co-requisite: CIS285
CIS 285	Multimedia Systems Lab	1	0	3	Co-requisite: CIS281A
CIS 318	Building Systems Using 4GLs	3	3	0	CIS260, Co-requisite: CIS319
CIS 319	Oracle Lab	1	0	3	Co-requisite: CIS318
CIS 341	Web Sites Design	3	3	0	CIS240 or MIS360
CIS 411	Client/Server Programming	3	3	0	CIS318, CS334
CIS 440	Object-Oriented Analysis and Design	3	3	0	CIS240, Co-requisite: CIS445
CIS 445	Object-Oriented Analysis and Design Lab	1	0	3	Co-requisite: CIS440

CIS 467	Data Mining	3	3	0	CIS260
CIS 499	Project	3	3	0	Complete successfully 98 credit hours
CS 117	Object Oriented Programming	3	3	0	CS101, Co-requisite: CS118
CS 118	Object Oriented Programming Lab	1	0	3	Co-requisite: CS117
CS 250	Data Structure	3	3	0	CS117, Co-requisite: CS255
CS 255	Data Structure Lab	1	0	3	Co-requisite: CS250
CS 334	Data and Network Communication	3	3	0	CS130, Co-requisite: CS335
CS 335	Data and Network Communication Lab	1	0	3	Co-requisite: CS334
MIS 361	Software Project Management	3	3	0	MIS360 or CIS240, Co-requisite: MIS362
MIS 362	Software Project Management Lab	1	0	3	Co-requisite: MIS361
MATH 102	Differentiation and Integration (2)	3	3	0	MATH101
MATH 152	Differential Equations	3	3	0	MATH101
Total		**56**	**48**	**24**	

2) Elective Courses (30 Credit hours):

    a) (15 Cr. Hrs.) Chosen from the following courses (at least 6 credits from the major)

Course Number	Course Name	Credit Hours	Weekly Hours		Pre-requisite
			Theory	Practical	
CIS 110	Internet Programming	3	3	0	CIS104
CIS 227	Human Computer Interaction	3	3	0	CS117
CIS 288	Simulation Techniques	3	3	0	CIS240
CIS 382	Develop Internet Applications	3	3	0	CIS341
CIS 431	Internet Services	3	3	0	CS334
CIS 442	Information Privacy and Security	3	3	0	CIS240, CIS260
CIS 464	Information Retrieval Systems	3	3	0	CIS256, CIS260
CIS 471	Intelligent Information Systems	3	3	0	CS376
CIS 480	Distributed Systems Applications	3	3	0	CIS411
CIS 486	Electronic Learning	3	3	0	CIS281
CIS 492	Special Topics	3	3	0	CIS440
CS 251	Algorithmic Analysis and Design	3	3	0	CS250, MATH152
CS 317	Advance Programming	3	3	0	CS117
CS 331	Operating Systems	3	3	0	CS130
CS 376	Artificial Intelligence	3	3	0	CS250
MATH 141	Mathematical Applications in Information Systems	3	3	0	MATH101
MIS 250A	Electronic Commerce	3	3	0	CIS104, MIS120
MIS 421	Legal Issues in MIS	3	3	0	CIS104, MIS120

MIS 461	Quality Control and Management	3	3	0	---
CE 496 *	A Training Course in the IT Field	3	3	0	----

* This course is considered for a student if he or she finishes one of the recognized training courses in the university for this purpose.

b) 15 elective credit hours distributed as follows:

   1) 6 credit hours the student can select from the following Science faculty courses:

Course Number	Course Name	Credit Hours	Weekly Hours		Pre-requisite
			Theory	**Practical**	
STAT 101	Statistics Basics (1)	3	3	0	--------
STAT 201	Statistics Basics (2)	3	3	0	STAT 101
STAT 211	Probabilities Basics (2)	3	3	0	STAT111, MATH101
MATH 203	Normal Differential Equations (1)	3	3	0	MATH102
MATH 241	Linear Algebra (1)	3	3	0	MATH101
MATH 282	Linear Programming and the Game Theory	3	3	0	-------
PH 104	Physics for CS students	3	3	0	-------

   2) 9 credit hours the student can select from the following courses:

Course Number	Course Name	Credit Hours	Weekly Hours		Pre requisite
			Theory	**Practical**	
M 101	Management Principles (1)	3	3	0	-----
EC 101	Total Economy Principles	3	3	0	-----
ACC 101	Accounting Principles (1)	3	3	0	----
FIN 210	Finance Principles (1)	3	3	0	-----
ART 222	3 Dimensions Design Basics	3	3	0	-----
ART 453	Cartoons	3	3	0	-----
MA 482	Communication Technology	3	3	0	-----
SS 412	Social Knowledge Science	3	3	0	------
G 476	Geographical Information Systems	3	3	0	-----
G 497	Applications in Geographical Information Systems	3	3	0	-----
PS 441	The psychology of Thinking and Innovation	3	3	0	-----
R 441	GIS and its Ruins Applications	3	3	0	-----
LAW 393*	Information Laws	3	3	0	------
TO 451	Tourism Information Systems	3	3	0	----
M 498	Management Skills	3	3	0	Graduate Candidate

   * Can't be taken together with MIS 421

B) Major-Minor Course Requirements (86 Cr. Hrs.) distributed as the following:

1) Major in Computer Information Systems: Will have 65 credit hours distributed as the following:

  a) Obligatory courses: 56 credit hours and those are the same courses for the single major in the CIS department.

b) Elective courses: 9 credits can be selected from the following courses with the condition that at least 3 credit hours are from the CIS department:

Course Number	Course Name	Credit Hours	Weekly Hours		Pre requisite
			Theory	**Practical**	
CIS 110	Internet Programming	3	3	0	CIS104
CIS 227	Human Computer Interaction	3	3	0	CS117
CIS 288	Simulation Techniques	3	3	0	CIS240
CIS 382	Develop Internet Applications	3	3	0	CIS341
CIS 431	Internet Services	3	3	0	CS334
CIS 442	Information Privacy and Security	3	3	0	CIS240, CIS260
CIS 464	Information Retrieval Systems	3	3	0	CIS256, CIS260
CIS 471	Intelligent Information Systems	3	3	0	CS376
CIS 480	Distributed Systems Applications	3	3	0	CIS411
CIS 486	Electronic Learning	3	3	0	CIS281
CIS 492	Special Topics	3	3	0	CIS440
CS 251	Algorithmic Analysis and Design	3	3	0	CS250, MATH152
CS 317	Advance Programming	3	3	0	CS117
CS 331	Operating Systems	3	3	0	CS130
CS 376	Artificial Intelligence	3	3	0	CS250
MATH 141	Mathematical Applications in Information Systems	3	3	0	MATH101
MIS 250	Electronic Commerce	3	3	0	CIS104, MIS120
M 498 **	Management Skills	3	3	0	Graduate candidate
CE 496 *	A Training Course in the IT Field	3	3	0	----

* This course is considered for the student if he or she finishes one of the recognized training courses in the university for this purpose.

** In case of branching in one of the Economy and Management science faculty departments, this course will not be considered from those required 9 in this elective group.

2) Minor in other Specializations:

a) According to the requirements set by the department offering the Minor Specialization, provided that the number of credit hours is not less than (21 Cr. Hrs.).

b) The departments of the minor Specialization are: Departments of the Faculty of Science, Departments of the Faculty of Economy and Management Science, The Graphics Design Department and the Department of Geography of the Faculty of Arts, and the Department of Bio-Informatics of the Faculty of Hajjawi for Applied Engineering.

C) Course requirements for Minor specialization in Computer Information Systems (21 Cr. Hrs.):

1) Obligatory Courses: 15 credits hours:

Course Number	Course Name	Credit Hours	Weekly Hours		Pre requisite
			Theory	**Practical**	
CS 117	Object Oriented Programming	3	3	0	CS101, Co-requisite: CS118
CS 118	Object Oriented Programming Lab	1	0	3	With CS117
CIS240	Software Engineering	3	3	0	CIS104, CS117, Co-requisite: CIS245
CIS 245	Software Engineering Lab	1	0	3	Co-requisite: CIS240

CIS 260	Database Systems	3	3	0	CS117
CIS 318	Building Systems Using 4GLs	3	3	0	CIS260, Co-requisite: CIS319
CIS 319	Oracle Lab	1	0	3	Co-requisite: CIS318

2) Elective Courses: 6 credits the student can select from the following courses:

Course Number	Course Name	Credit Hours	Weekly Hours		Pre requisite
			Theory	Practical	
CIS 281A	Multimedia Systems	3	3	0	CIS104, Co-requisite: CIS285
CIS 285	Multimedia Systems Lab	1	0	3	With CIS281A
CIS 341	Web Sites Design	3	3	0	CIS240 or MIS360
CIS 382	Develop Internet Applications	3	3	0	CIS341
CIS 440	Object Oriented Analysis and Design	3	3	0	CIS240, Co-requisite: CIS445
CIS 467	Data Mining	3	3	0	CIS260

Description of Courses

Offered by the

Department of Computer Information systems (CIS)

CIS 100: COMPUTER SKILLS (2)   **3 Hrs.**   **(Prereq.: CS 100)**

The main objective of this course is to provide students with the skills needed to use personal computer applications in real life. It covers a range of topics including: the basic concepts in building database applications using Microsoft Access, information presentation using MS-Power Point, develop and design web pages using MS Front Page, information access and e-mail using the Internet and statistical analysis using SPSS.

CIS 103: INTRODUCTION TO INFORMATION TECHNOLOGY   **3 Hrs.** **(Prereq.: None)**

The main objective of this course is to provide students with the main concepts of information and communications technologies, their applications, and infrastructure. It covers a range of topics including: data processing technologies, I/O and storage technologies, multimedia technologies, emerging telecommunications and network technologies, IT applications (such as: e-mail, e-publishing, e-commerce, e-learning, e-government, money transfer and banking systems, robotics and factory control systems), selection criteria of hardware and software, the software and hardware market, social and global issues of IT, future trends.

CIS 104: INTRODUCTION TO INFORMATION SYSTEMS   **3 Hrs.**   **(Prereq.: CIS 103)**

The main objective of this course is to provide students with an overall understanding of the main concepts of information systems, and to highlight the importance of information systems in modern organizations and societies. It covers a range of topics including: Information, data, and system concepts; information requirements in modern organizations and businesses (including decision making, operations, and other types of requirements); introducing different types of information systems; exploring the systems development life cycle (analysis, design, and implementation); methodologies of developing information systems; managing resources of information systems (data, hardware, …etc); knowledge management; quality and evaluation of information systems; ethical, social and security issues of information systems.

CIS 110: INTERNET PROGRAMMING   **3 Hrs.**   **(Prereq.: CIS 104)**

The main objective of this course is to provide students with the knowledge needed to understand the internet, design WebPages, and the use HTML. It covers a range of topics including: basic concepts of the Internet and internet browsers, Internet applications (operating system dependent vs. operating system independent), Web page creation tools and languages, basic HTML (text, fonts, colors, images, lists, tables), advanced HTML (Frames, Forms), scripting and scripting languages, Web pages and Web site creation, and case studies.

CIS 227: HUMAN COMPUTER INTERACTION 3 Hrs. (Prereq.: CS117)

This course is intended to provide students with the concepts and knowledge of interaction between humans and computers with focus on presentation of data and designing suitable interfaces for the user. It covers a range of topics including: basic concepts, human information processing (cognition, perception, movement, culture, communication, human diversity, motivation for computer interaction, human performance models, etc.), user interface design principles, information presentation, visual, auditory and tactile displays, speech communication, data entry, control, tools and feedback, human factors in computer programming, workspace design, environmental   and legal considerations.

CIS 240: SOFTWARE ENGINEERING 3 Hrs. (Prereq.:CIS104, CS117, Co-req.: CIS245)

The main objective of this course is to provide students with the knowledge and necessary skills for building software with focus on analysis, design, and building models. It covers a range of topics including: concepts and terminology, the software development process, software planning and management, software requirements specifications, system modeling, software prototyping, quality specifications, program specifications, system and software design approaches (function-oriented design, object-oriented design, distributed systems design), software engineering CASE tools. This course is supplemented by a practical component covered in CIS245 (concurrently).

CIS 245: SOFTWARE ENGINEERING LAB 1 Hr. (Co-req.: CIS240)

The course is intended to complement CIS240 by providing students with a range of skills in designing and modeling software using a software engineering tool such as Rational Rose. The course includes exercises and practical cases that suit the subjects covered in CIS240.

CIS 256: FILE STRUCTURES 3 Hrs. (Prereq.: CS250)

The main objective of this course is to provide students with the main principles that are needed to understand and deal with different kinds of files, their structures, and techniques. It covers a range of topics including: file concepts, basic file operations, physical file organization, file compression techniques, sequential file structures, hashing and direct organization structures, indexed structures, list file structures (inverted, multi-key, etc.), tree structures (B trees, B+ trees,... etc.), external sorting techniques, searching techniques. The practical part for this course is covered through exercises and writing programs using one of the programming languages.

CIS 260: DATABASE SYSTEMS 3 Hrs. (Prereq.: CS117)

The main objective of this course is to provide students with the basic knowledge of database systems, their types, how to create and deal with them, and their theoretical and mathematical foundations. It covers a range of topics including: concepts, database architecture, database users, database approach, relational data model, relational algebra, SQL query language, the relational model and the normalization process, object-oriented database approach. The practical part for this course focuses on teaching students how to use one of the database design tools.

CIS 281A: MULTIMEDIA SYSTEMS   3 Hrs.   (Prereq.: CIS104, Co-req.: CIS285)

This course is intended to provide students with the knowlege needed for understanding, using, and upgrading systems with multimedia data. It covers a range of topics including: Multimedia concepts and terminology, interactive multimedia technology, multimedia data types and formats (graphics, images, animation, audio, video, etc.), desktop publishing, hypermedia, presentation media, integrated multimedia authoring techniques, techniques for designing and producing multimedia applications, using multimedia-authoring tools, industry standards, future directions in interactive multimedia technology. This course is supplemented by a practical component covered in CIS285 (concurrently).

CIS 285: MULTIMEDIA LAB   1 Hr.   (Co-req.: CIS281A)

The course is intended to complement CIS281A by providing students with a full range of skills using a suitable tool such as Adobe Photoshop, Flash, and Adobe Illustrator to build and use a multimedia system. The course includes exercise and practical cases that suit the subjects covered in CIS281A.

CIS 288: SIMULATION TECHNIQUES   3 Hrs.   (Prereq.: CIS240)

The main objective of this course is to teach students the importance of simulation in information systems, with concentration on the techniques used to collect and analyze data. It covers a range of topics including: concepts of simulation, the use of simulation in information systems, simulation methodologies, elements of discrete simulation, gathering statistical observations in simulation, collection and analysis of results, simulation languages. The practical part for this course includes using a suitable programming tool such as SPSS or SIMSCRIPT and applying it to an information system.

CIS 318: BUILDING SYSTEMS USING 4GLs   3 Hrs.   (Prereq.: CIS260,Co-req.: CIS319)

The main objective of this course is to provide students with the characteristics of 4GL languages, and how to use them to build systems. It covers a range of topics including: High-level languages vs. 4GLs, software engineering and 4GLs life cycle, features of 4GLs (data dictionary, nonprocedural language interactive query facilities, report generator, screen formatter, data analysis and modeling tools, macros, reusable code, backup and recovery, security and privacy safeguards, links to other DBMS, links to HL languages, records and file maintenance, etc), system portability, application and program generators, examples of 4GLs and application case studies. This course is supplemented by a practical component covered in CIS319 (concurrently).

CIS 319: ORACLE LAB   1 Hr.   (Co-req.: CIS318)

The course is intended to complement CIS318 course by providing students with a range of skills in developing database systems using the recent ORACLE environment which includes PL*/SQL environment and writing programs using SQL language. The course includes exercises and practical cases that suit the subjects covered in CIS318.

CIS 341: WEBSITE DESIGN   3 Hrs.   (Prereq.: CIS240 or MIS 360)

This course is intended to provide students with the knowledge and skills necessary for building and evaluating web sites. It covers a range of topics including: basic concepts of the

Internet and internet browsers, fundamentals of Website design, Websites building tools and languages, basics of XHTML (text, fonts, colors, images, lists, tables, frames, forms), Scripting and Scripting Languages (VB Script, Java Script), Website publishing, Website evaluation and assessment, case studies. The practical part includes applications using web design tools (such as FrontPage) and languages (such as XHTML and SIMSCRIPT).

CIS 382: DEVELOPING WEB APPLICATIONS   3 Hrs.   (Prereq.: CIS341)

The main objective of this course is to provide students with basic knowledge and technical aspects and skills needed to build Web applications. It covers a range of topics including: quick review of the Internet and Internet programming concepts, Web Servers and Web application servers, design methodologies with concentration on object-oriented concepts, client-side programming, server-side programming, active server pages, database connectivity to Web applications, adding dynamic content to Web applications, programming common gateway interfaces, programming the user interface for the Web applications. The practical part for this course may use a programming tool such as CGI for developing Web applications.

CIS 411: CLIENT-SERVER PROGRAMMING   3 Hrs.   (Prereq.: CIS318, CS334)

The main objective of this course is to enhance students understanding of systems that are connected with a network with concentration on the role of both server and client in sending and receiving data. It covers a range of topics including: Client/Server Systems Architecture, System planning and Design, Middleware and Data Access Protocols, issues with Concurrent Access to shared data, Client/Server Technologies (Connection-Oriented, Connectionless, Interactive, etc), Workgroup Servers, Application Servers, Client-Side Programming, Server-Side Programming, Database Connectivity, CGI Programming, RPC, Security issues. The practical part of this course includes applying the concepts studied in this course using a programming tool such as ASP.NET

CIS 431: INTERNET SERVICES   3 Hrs   (Prereq.: CS334)

The main objective of this course is to expose students to advanced topics in Internet communication, especially those that relate to modern Internet technologies, techniques and protocols. It covers a range of topics including: modern Internet protocols, application layer services and networks, transport layer service support, supporting algorithms for delivery of multimedia content and communications, scalable World Wide Web services, Internet telephony, instant messaging, and other emerging technologies and services. The course will enable students to evaluate Internet services, applications, security considerations, and technologies in terms of their operations and management requirements. It will also enable them to design new Internet services in a manner that is scalable, robust and efficient. The practical part of this course involves exercises and practical applications in the lab.

CIS 440: OBJECT-ORIENTED ANALYSIS AND DESIGN   3 Hrs.   (Prereq.: CIS240, Co-req.: CIS445)

The main objective of this course is to provide students with basic concepts, knowledge, and necessary skills in analysis and design of object oriented systems with emphasis on the models offered by the Unified Modeling Language (UML) and the system life cycle using the Rational Unified Process (RUP). It covers a range of topics including: Object-oriented design concepts, foundations and elements of the object-oriented model, classes and objects,

relationships among classes, relationships among objects, approaches to identifying classes and objects, object-oriented design and modeling methodologies using UML (class and object diagrams, interaction diagrams, state transition diagrams, component diagrams, deployment diagrams, etc.), the object-oriented software development process (analysis, design and implementation as presented in the RUP), CASE tools. This course is supplemented by a practical component covered in CIS445 (concurrently).

CIS 442: SECURITY AND PRIVACY OF INFORMATION 3 Hrs. (Prereq.: CIS240, CIS260)

The main objective of this course is to expose students to the importance of security in exchanging information and the basic principles of security and intrusion prevention techniques. It covers a range of topics including: ethical uses of information and information systems, privacy considerations, policies and standards, security measures (protection, detection and reaction, attacks and threats, intrusion prevention, encryption and credentials identification and authentication, hacking security, access controls, identity management, etc.), security tricks and the human factor, disaster recovery, security risk analysis and assessment, security management. The practical part involves applying the techniques learned in this course, such as encoding, using a suitable language along with exercises and practical applications.

CIS 445: OBJECT-ORIENTED ANALYSIS AND DESIGN LAB   1 Hr. (Co-req.: CIS440)

The course is intended to complement CIS440 course by providing students with a range of skills in UML-based object-oriented design using a suitable software engineering CASE tool such as the Rational Rose. The course includes exercise and practical cases that suit the subjects covered in CIS440.

CIS 464: INFORMATION RETRIEVAL SYSTEMS   3 Hrs. (Prereq.: CIS256, CIS260)

The main objective of this course is to provide students with the basic concepts of information retrieval systems, their types and different techniques in storing, manipulating and retrieving data. It covers a range of topics including: Functional view of information retrieval, types of IRS, design issues of IRS (keyword-based retrieval, file structures, thesaurus construction, etc.), IR data structures and algorithms (lexical analysis, stemming, term weighting, associative indexing, Boolean operations, string searching and matching techniques, etc.), relevance feedback and query modification, applications and case studies. The practical part includes applications and exercises that suit the concepts and techniques covered in this course.

CIS 467: DATA MINING   3 Hrs.   (Prereq.: CIS260)

The main objective of this course is to provide students with the basic concepts, methods, and new techniques of extracting knowledge from data. It covers a range of topics including: Knowledge discovery fundamentals, data mining concepts and functions, data pre-processing, data reduction, mining association rules in large databases, classification and prediction techniques, cluster analysis algorithms, data visualization, mining complex types of data (text mining, multimedia mining, Web mining), data mining languages, data mining applications and new trends. The practical part includes applications and exercises using a data mining tool such as WEKA.

CIS 471: INTELLIGENT INFORMATION SYSTEMS   3 Hrs.   (Prereq.: CS376)

This course is intended to provide students with concepts, techniques, and methods that can be used to develop systems with special, non-traditional characteristics that simulate human intelligence. It covers a range of topics including: intelligence in natural and artificial systems, framework and theoretical foundations of Intelligent Information Systems, knowledge representation, design and architecture, goals and value judgments, system learning, planning of actions, programming for Intelligent Information Systems, applications and case studies.

CIS 480: DISTRIBUTED SYSTEMS APPLICATIONS   3 Hrs.   (Prereq.: CIS411)

The main objective of this course is to provide students with the basic concepts, knowledge, and skills of distributed systems, their types, how to program these systems and how to evaluate them. It covers a range of topics including: basic concepts of distributed systems, design and implementation issues of distributed applications, enterprise client-server architectures, distributed objects architecture, object request brokers (ORB), software performance engineering and its activities, design principles and techniques of distributed applications (workload, efficiency, locality, sharing, database, parallelism), distributed applications types (middleware and performance, architecture and design for high performance), performance tools, DBMS technology, data replication, data warehousing, transaction managers and monitors.

CIS 486: ELECTRONIC LEARNING   3 Hrs.   (Prereq.: CIS281A)

The main objective of this course is to provide students with the basic knowledge of e-learning and how to apply and evaluate it. It covers a range of topics including: introducing E-learning, learning theories and information interpretation, justifying E-Learning to top management, E-learning strategies, building and managing an E-learning infrastructure, content development, content delivery, tools needed to build an E-learning course, integrating E-learning and classroom learning, E-learning and distance learning, applications and case studies, future trends. The practical part of this course involves using a suitable e-learning tool such as Blackboard along with practical applications and study cases.

CIS 492: SPECIAL TOPICS   3 Hrs.   (Prereq.: CIS 440)

The main objective of this course is to provide students with the knowledge of a topic that is not covered in any of the courses listed above, with the approval of the department board.

CIS 499: GRADUATION PROJECT   3 Hrs.   (Prereq.: Pass 98 Credit Hrs)

The main objective of this course is to provide students with the ability to develop an information system and document it efficiently. The student is supposed to select a problem and apply the knowledge and skills learned from other courses so that the student can develop a complete system and write a report that documents the problem, the analysis method, the algorithms used in solving the problem, the designs used, the code, the execution, and how the system works.

Description of Courses

Offered by the

Department of Computer Information systems (CIS)

CIS 100: COMPUTER SKILLS (2)   **3 Hrs.**   **(Prereq.: CS 100)**

The main objective of this course is to provide students with the skills needed to use personal computer applications in real life. It covers a range of topics including: the basic concepts in building database applications using Microsoft Access, information presentation using MS-Power Point, develop and design web pages using MS Front Page, information access and e-mail using the Internet and statistical analysis using SPSS.

CIS 103: INTRODUCTION TO INFORMATION TECHNOLOGY   3 Hrs. (Prereq.: None)

The main objective of this course is to provide students with the main concepts of information and communications technologies, their applications, and infrastructure. It covers a range of topics including: data processing technologies, I/O and storage technologies, multimedia technologies, emerging telecommunications and network technologies, IT applications (such as: e-mail, e-publishing, e-commerce, e-learning, e-government, money transfer and banking systems, robotics and factory control systems), selection criteria of hardware and software, the software and hardware market, social and global issues of IT, future trends.

CIS 104: INTRODUCTION TO INFORMATION SYSTEMS   3 Hrs.   (Prereq.: CIS 103)

The main objective of this course is to provide students with an overall understanding of the main concepts of information systems, and to highlight the importance of information systems in modern organizations and societies. It covers a range of topics including: Information, data, and system concepts; information requirements in modern organizations and businesses (including decision making, operations, and other types of requirements); introducing different types of information systems; exploring the systems development life cycle (analysis, design, and implementation); methodologies of developing information systems; managing resources of information systems (data, hardware, …etc); knowledge management; quality and evaluation of information systems; ethical, social and security issues of information systems.

CIS 110: INTERNET PROGRAMMING   3 Hrs.   (Prereq.: CIS 104)

The main objective of this course is to provide students with the knowledge needed to understand the internet, design WebPages, and the use HTML. It covers a range of topics including: basic concepts of the Internet and internet browsers, Internet applications (operating system dependent vs. operating system independent), Web page creation tools and languages, basic HTML (text, fonts, colors, images, lists, tables), advanced HTML (Frames, Forms), scripting and scripting languages, Web pages and Web site creation, and case studies.

CIS 227: HUMAN COMPUTER INTERACTION   **3 Hrs.**   **(Prereq.: CS117)**

This course is intended to provide students with the concepts and knowledge of interaction between humans and computers with focus on presentation of data and designing suitable interfaces for the user. It covers a range of topics including: basic concepts, human information processing (cognition, perception, movement, culture, communication, human diversity, motivation for computer interaction, human performance models, etc.), user interface design principles, information presentation, visual, auditory and tactile displays, speech communication, data entry, control, tools and feedback, human factors in computer programming, workspace design, environmental and legal considerations.

CIS 240: SOFTWARE ENGINEERING   **3 Hrs.**   **(Prereq.:CIS104, CS117, Co-req.: CIS245)**

The main objective of this course is to provide students with the knowledge and necessary skills for building software with focus on analysis, design, and building models. It covers a range of topics including: concepts and terminology, the software development process, software planning and management, software requirements specifications, system modeling, software prototyping, quality specifications, program specifications, system and software design approaches (function-oriented design, object-oriented design, distributed systems design), software engineering CASE tools. This course is supplemented by a practical component covered in CIS245 (concurrently).

CIS 245: SOFTWARE ENGINEERING LAB   **1 Hr.**   **(Co-req.: CIS240)**

The course is intended to complement CIS240 by providing students with a range of skills in designing and modeling software using a software engineering tool such as Rational Rose. The course includes exercises and practical cases that suit the subjects covered in CIS240.

CIS 256: FILE STRUCTURES   **3 Hrs.**   **(Prereq.: CS250)**

The main objective of this course is to provide students with the main principles that are needed to understand and deal with different kinds of files, their structures, and techniques. It covers a range of topics including: file concepts, basic file operations, physical file organization, file compression techniques, sequential file structures, hashing and direct organization structures, indexed structures, list file structures (inverted, multi-key, etc.), tree structures (B trees, B+ trees,... etc.), external sorting techniques, searching techniques. The practical part for this course is covered through exercises and writing programs using one of the programming languages.

CIS 260: DATABASE SYSTEMS   **3 Hrs.**   **(Prereq.: CS117)**

The main objective of this course is to provide students with the basic knowledge of database systems, their types, how to create and deal with them, and their theoretical and mathematical foundations. It covers a range of topics including: concepts, database architecture, database users, database approach, relational data model, relational algebra, SQL query language, the relational model and the normalization process, object-oriented database approach. The practical part for this course focuses on teaching students how to use one of the database design tools.

CIS 281A: MULTIMEDIA SYSTEMS   3 Hrs.   (Prereq.: CIS104, Co-req.: CIS285)

This course is intended to provide students with the knowlege needed for understanding, using, and upgrading systems with multimedia data. It covers a range of topics including: Multimedia concepts and terminology, interactive multimedia technology, multimedia data types and formats (graphics, images, animation, audio, video, etc.), desktop publishing, hypermedia, presentation media, integrated multimedia authoring techniques, techniques for designing and producing multimedia applications, using multimedia-authoring tools, industry standards, future directions in interactive multimedia technology. This course is supplemented by a practical component covered in CIS285 (concurrently).

CIS 285: MULTIMEDIA LAB   1 Hr.   (Co-req.: CIS281A)

The course is intended to complement CIS281A by providing students with a full range of skills using a suitable tool such as Adobe Photoshop, Flash, and Adobe Illustrator to build and use a multimedia system. The course includes exercise and practical cases that suit the subjects covered in CIS281A.

CIS 288: SIMULATION TECHNIQUES   3 Hrs.   (Prereq.: CIS240)

The main objective of this course is to teach students the importance of simulation in information systems, with concentration on the techniques used to collect and analyze data. It covers a range of topics including: concepts of simulation, the use of simulation in information systems, simulation methodologies, elements of discrete simulation, gathering statistical observations in simulation, collection and analysis of results, simulation languages. The practical part for this course includes using a suitable programming tool such as SPSS or SIMSCRIPT and applying it to an information system.

CIS 318: BUILDING SYSTEMS USING 4GLs   3 Hrs.   (Prereq.: CIS260,Co-req.: CIS319)

The main objective of this course is to provide students with the characteristics of 4GL languages, and how to use them to build systems. It covers a range of topics including: High-level languages vs. 4GLs, software engineering and 4GLs life cycle, features of 4GLs (data dictionary, nonprocedural language interactive query facilities, report generator, screen formatter, data analysis and modeling tools, macros, reusable code, backup and recovery, security and privacy safeguards, links to other DBMS, links to HL languages, records and file maintenance, etc), system portability, application and program generators, examples of 4GLs and application case studies. This course is supplemented by a practical component covered in CIS319 (concurrently).

CIS 319: ORACLE LAB   1 Hr.   (Co-req.: CIS318)

The course is intended to complement CIS318 course by providing students with a range of skills in developing database systems using the recent ORACLE environment which includes PL*/SQL environment and writing programs using SQL language. The course includes exercises and practical cases that suit the subjects covered in CIS318.

CIS 341: WEBSITE DESIGN   3 Hrs.   (Prereq.: CIS240 or MIS 360)

This course is intended to provide students with the knowledge and skills necessary for building and evaluating web sites. It covers a range of topics including: basic concepts of the

Internet and internet browsers, fundamentals of Website design, Websites building tools and languages, basics of XHTML (text, fonts, colors, images, lists, tables, frames, forms), Scripting and Scripting Languages (VB Script, Java Script), Website publishing, Website evaluation and assessment, case studies. The practical part includes applications using web design tools (such as FrontPage) and languages (such as XHTML and SIMSCRIPT).

CIS 382: DEVELOPING WEB APPLICATIONS   3 Hrs.   (Prereq.: CIS341)

The main objective of this course is to provide students with basic knowledge and technical aspects and skills needed to build Web applications. It covers a range of topics including: quick review of the Internet and Internet programming concepts, Web Servers and Web application servers, design methodologies with concentration on object-oriented concepts, client-side programming, server-side programming, active server pages, database connectivity to Web applications, adding dynamic content to Web applications, programming common gateway interfaces, programming the user interface for the Web applications. The practical part for this course may use a programming tool such as CGI for developing Web applications.

CIS 411: CLIENT-SERVER PROGRAMMING   3 Hrs.   (Prereq.: CIS318, CS334)

The main objective of this course is to enhance students understanding of systems that are connected with a network with concentration on the role of both server and client in sending and receiving data. It covers a range of topics including: Client/Server Systems Architecture, System planning and Design, Middleware and Data Access Protocols, issues with Concurrent Access to shared data, Client/Server Technologies (Connection-Oriented, Connectionless, Interactive, etc), Workgroup Servers, Application Servers, Client-Side Programming, Server-Side Programming, Database Connectivity, CGI Programming, RPC, Security issues. The practical part of this course includes applying the concepts studied in this course using a programming tool such as ASP.NET

CIS 431: INTERNET SERVICES   3 Hrs   (Prereq.: CS334)

The main objective of this course is to expose students to advanced topics in Internet communication, especially those that relate to modern Internet technologies, techniques and protocols. It covers a range of topics including: modern Internet protocols, application layer services and networks, transport layer service support, supporting algorithms for delivery of multimedia content and communications, scalable World Wide Web services, Internet telephony, instant messaging, and other emerging technologies and services. The course will enable students to evaluate Internet services, applications, security considerations, and technologies in terms of their operations and management requirements. It will also enable them to design new Internet services in a manner that is scalable, robust and efficient. The practical part of this course involves exercises and practical applications in the lab.

CIS 440: OBJECT-ORIENTED ANALYSIS AND DESIGN   3 Hrs.   (Prereq.: CIS240, Co-req.: CIS445)

The main objective of this course is to provide students with basic concepts, knowledge, and necessary skills in analysis and design of object oriented systems with emphasis on the models offered by the Unified Modeling Language (UML) and the system life cycle using the Rational Unified Process (RUP). It covers a range of topics including: Object-oriented design concepts, foundations and elements of the object-oriented model, classes and objects,

relationships among classes, relationships among objects, approaches to identifying classes and objects, object-oriented design and modeling methodologies using UML (class and object diagrams, interaction diagrams, state transition diagrams, component diagrams, deployment diagrams, etc.), the object-oriented software development process (analysis, design and implementation as presented in the RUP), CASE tools. This course is supplemented by a practical component covered in CIS445 (concurrently).

CIS 442: SECURITY AND PRIVACY OF INFORMATION 3 Hrs. (Prereq.: CIS240, CIS260)

The main objective of this course is to expose students to the importance of security in exchanging information and the basic principles of security and intrusion prevention techniques. It covers a range of topics including: ethical uses of information and information systems, privacy considerations, policies and standards, security measures (protection, detection and reaction, attacks and threats, intrusion prevention, encryption and credentials identification and authentication, hacking security, access controls, identity management, etc.), security tricks and the human factor, disaster recovery, security risk analysis and assessment, security management. The practical part involves applying the techniques learned in this course, such as encoding, using a suitable language along with exercises and practical applications.

CIS 445: OBJECT-ORIENTED ANALYSIS AND DESIGN LAB   1 Hr. (Co-req.: CIS440)

The course is intended to complement CIS440 course by providing students with a range of skills in UML-based object-oriented design using a suitable software engineering CASE tool such as the Rational Rose. The course includes exercise and practical cases that suit the subjects covered in CIS440.

CIS 464: INFORMATION RETRIEVAL SYSTEMS   3 Hrs. (Prereq.: CIS256, CIS260)

The main objective of this course is to provide students with the basic concepts of information retrieval systems, their types and different techniques in storing, manipulating and retrieving data. It covers a range of topics including: Functional view of information retrieval, types of IRS, design issues of IRS (keyword-based retrieval, file structures, thesaurus construction, etc.), IR data structures and algorithms (lexical analysis, stemming, term weighting, associative indexing, Boolean operations, string searching and matching techniques, etc.), relevance feedback and query modification, applications and case studies. The practical part includes applications and exercises that suit the concepts and techniques covered in this course.

CIS 467: DATA MINING   3 Hrs.   (Prereq.: CIS260)

The main objective of this course is to provide students with the basic concepts, methods, and new techniques of extracting knowledge from data. It covers a range of topics including: Knowledge discovery fundamentals, data mining concepts and functions, data pre-processing, data reduction, mining association rules in large databases, classification and prediction techniques, cluster analysis algorithms, data visualization, mining complex types of data (text mining, multimedia mining, Web mining), data mining languages, data mining applications and new trends. The practical part includes applications and exercises using a data mining tool such as WEKA.

CIS 471: INTELLIGENT INFORMATION SYSTEMS   3 Hrs.   (Prereq.: CS376)

This course is intended to provide students with concepts, techniques, and methods that can be used to develop systems with special, non-traditional characteristics that simulate human intelligence. It covers a range of topics including: intelligence in natural and artificial systems, framework and theoretical foundations of Intelligent Information Systems, knowledge representation, design and architecture, goals and value judgments, system learning, planning of actions, programming for Intelligent Information Systems, applications and case studies.

CIS 480: DISTRIBUTED SYSTEMS APPLICATIONS   3 Hrs.   (Prereq.: CIS411)

The main objective of this course is to provide students with the basic concepts, knowledge, and skills of distributed systems, their types, how to program these systems and how to evaluate them. It covers a range of topics including: basic concepts of distributed systems, design and implementation issues of distributed applications, enterprise client-server architectures, distributed objects architecture, object request brokers (ORB), software performance engineering and its activities, design principles and techniques of distributed applications (workload, efficiency, locality, sharing, database, parallelism), distributed applications types (middleware and performance, architecture and design for high performance), performance tools, DBMS technology, data replication, data warehousing, transaction managers and monitors.

CIS 486: ELECTRONIC LEARNING   3 Hrs.   (Prereq.: CIS281A)

The main objective of this course is to provide students with the basic knowledge of e-learning and how to apply and evaluate it. It covers a range of topics including: introducing E-learning, learning theories and information interpretation, justifying E-Learning to top management, E-learning strategies, building and managing an E-learning infrastructure, content development, content delivery, tools needed to build an E-learning course, integrating E-learning and classroom learning, E-learning and distance learning, applications and case studies, future trends. The practical part of this course involves using a suitable e-learning tool such as Blackboard along with practical applications and study cases.

CIS 492: SPECIAL TOPICS   3 Hrs.   (Prereq.: CIS 440)

The main objective of this course is to provide students with the knowledge of a topic that is not covered in any of the courses listed above, with the approval of the department board.

CIS 499: GRADUATION PROJECT   3 Hrs.   (Prereq.: Pass 98 Credit Hrs)

The main objective of this course is to provide students with the ability to develop an information system and document it efficiently. The student is supposed to select a problem and apply the knowledge and skills learned from other courses so that the student can develop a complete system and write a report that documents the problem, the analysis method, the algorithms used in solving the problem, the designs used, the code, the execution, and how the system works.