



Faculty of Computer Science and Informatics

Computer Information Systems Department

**Study Plan of Bachelor's Degree in
Computer Information Systems
Academic Year: 2020/2021**



Department Vision

Distinction in preparing specialized graduates with competitive skills in the field of information systems and community service.

Department Mission

To prepare innovative and competitive students in the field of systems development, business projects and computing applications to meet needs of labor market locally and regionally, and improve the performance of organizations and local community in accordance with local and international quality assurance standards.

Department Objectives

1. Possess the necessary skills of theoretical and applied knowledge in the field of information systems.
2. Gain professional competencies and confidently practice their profession, and regional competitiveness with others.
3. Continue lifelong learning and professional development amid future technological changes.
4. Be active members of teamwork with professional and ethical responsibilities, and know the needs of the community.



Learning Outcomes

Graduates of the program will have an ability to:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Support the delivery, use, and management of information systems within an information systems environment. [IS]



Contents of the Study Plan

The bachelor's degree program in Computer Information Systems consists of 132 credit hours distributed as follows:

No	Requirement Type	Credited Hours	Percentage
First	University Requirements	27	%20.45
Second	College Requirements	23	%17.42
Third	Program Requirements	82	%62.12
Total		132	100%

University Coding System

4	0	2	—	Year	Term	—	—
College Code	Department Code		Knowledge Area	Course Level		Course Sequence	
Faculty of Computer Science and Informatics	01 Masters in Computer Science 02 Computer Information System 03 Software Engineering 04 Mobile Computing						



Knowledge Areas

No	Knowledge Area	Credit Hours in the Study Plan
01	Computer Science and Algorithms: Discrete Mathematics, Data Structures, Algorithms.	9
02	Programming: Object Oriented Programming, Visual Programming, Web Application Programming	12
03	Networks: Computer Networks, Network Security.	6
04	Applications and Information Science: Software Engineering, Database, Systems Analysis and Design.	9
05	Courses in Computer Information Systems: Database Systems Management, Data Warehouses, Data Mining, Information Retrieval, Information Security.	15
06	Supporting Knowledge Areas: Statistics, Numerical Analysis, Linear Algebra.	6
07	Elective Courses: Several courses within the sub-field of the program.	9
–	Field training: 0 hours after passing a minimum of 90 credit hours.	3
–	Graduation Project: 3 credit hours after passing 90 credit hours.	3



First: University Requirements: 27 Credit Hours

A. University Core: 15 Credit Hours

Code	Course Name	Credit Hours	Prerequisite
50511102	Arabic Language I	3	50511108
50511103	English Language I	3	50511109
50511108	Arabic Language Basics	0	
50511109	English Language Basics	0	
50511110	Computer Basics	0	
50511206	National Education	3	
50511308	Military Sciences	3	
50541103	Computer Skills	3	50511110
Total		15	

B. University Elective: choose 12 Credit Hours from the following courses

Code	Course Name	Credit Hours	Prerequisite
50511204	Life Skills	3	
50511306	Entrepreneurship and Innovation	3	
50521101	Arabic Language 2	3	50511102
50521102	English Language 2	3	50511103
50521203	Principles of Psychology	3	
50521204	Human Rights	3	
50531101	Islamic Culture	3	
50531205	Jerusalem and the Hashemite Guardianship	3	
50541203	Environment and Society	3	
50541206	Health and Society	3	
50541307	Communication and Internet	3	
50541308	Foreign Language	3	



Second: College Core Requirements: 23 Credit Hours

Code	Course Name	CH	Th	Lab	Prerequisite
40212101	Data Structures	3	3	0	40421203
40241101	Fundamentals of Information Technology	3	3	0	
40241202	Databases	3	3	0	40241101
40241203	Laboratory of Databases	1	0	1	40241202 (co)
40312101	Discrete Mathematics	3	3	0	50551105
40322101	Websites Design	3	3	0	40241101
40421108	Introduction to Programming	3	3	0	
40421109	Laboratory of Introduction to Programming	1	0	1	40421108 (co)
40264401	Communication and Writing Skills	3	3	0	
Total		23	21	2	

Third: Program Requirements: 82 Credit Hours

A. Program Core: 67 Credit Hours

Code	Course Name	CH	Th	Lab	Prerequisite
40251102	Fundamentals of Management Information Systems	3	3	0	
40253204	IS Enterprise Architecture	3	3	0	40252202
40421211	Object Oriented Programming	3	3	0	40421108
40421212	Laboratory of Object Oriented Programming	1	0	1	40421211 (co)
40213103	Algorithms Design and Analysis	3	3	0	40212101
40223101	Database Programming	3	3	0	40252201
40252202	IS Strategy, Management and Acquisition	3	3	0	40252201
40252201	Database Management Systems	3	3	0	40241202
40253102	Information Retrieval, Search, & Visualization	3	3	0	40252201
40253205	Information Systems Security	3	3	0	40322202
40253206	Data warehouses and business intelligence	3	3	0	40252201
40254107	Data Mining for Business Intelligence	3	3	0	40253206
40254208	Electronic Business and Commerce	3	3	0	40322202
40284101	Field Training on CIS	3	3	0	Complete 80 CH
40294105	Applied Graduation Project (1)	1	1	0	Complete 90 CH
40294206	Applied Graduation Project (2)	2	2	0	40294205
40322202	Programming of Internet Applications	3	3	0	40241202 + 40322101
40322203	Visual Programming	3	3	0	40421203
40342101	Systems Analysis and Design	3	3	0	40241202
40352201	Fundamentals of Software Engineering	3	3	0	40342101
40353103	Software Project Management	3	3	0	40352201



Code	Course Name	CH	Th	Lab	Prerequisite
40433201	Computer Networks	3	3	0	40241101
40543204	Network Management and Security	3	3	0	40433201
40212202	Operating Systems	3	3	0	40212101
Total		67	66	1	

B. Program Elective: 9 Credit Hours, choose from one of the following Tracks

Code	Course Name	CH	Th	Lab	Prerequisite
40253104	Geographic Information Systems (GIS)	3	3	0	40322202
40293201	Special Topics in CIS	3	3	0	Complete 60 CH
40254206	Emerging Topics in IT	3	3	0	40254208
40253207	Decision support systems	3	3	0	40253102
40253105	Entrepreneurship Systems	3	3	0	40253207
40254205	Multimedia Technologies For CIS	3	3	0	40322203

C. Support Courses: 6 Credit Hours

Code	Course Name	CH	Th	Lab	Prerequisite
50223121	Numerical Analysis	3	3	0	50551105
50551105	Principles of Mathematics and Statistics	3	3	0	
Total		6	6	0	



Advisory Plan

Year 1				
1 st Semester (Fall)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
50551105	Principles of Mathematics and Statistics	3		
40251102	Fundamentals of Management Information Systems	3		
40421108	Introduction to Programming	3		
40421109	Laboratory of Introduction to Programming	1		40421108
40241101	Fundamentals of Information Technology	3		
	University Core Requirement	3		
Total		16		

2 nd Semester (Spring)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
50223121	Numerical Analysis	3	50551105	
40421211	Object Oriented Programming	3	40421101	
40421212	Laboratory of Object Oriented Programming	1		40421211
40241202	Databases	3	40241101	
40241203	Laboratory of Databases	1		40241202
	University Elective Requirement	3		
Total		14		



Year 2				
1 st Semester (Fall)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40312101	Discrete Mathematics	3	50551105	
40212101	Data Structures	3	40421203	
40322101	Websites Design	3	40241101	
40252201	Database Management Systems	3	40241202	
40342101	Systems Analysis and Design	3	40241202	
	University Core Requirement	3		
Total		18		

2 nd Semester (Spring)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40212202	Operating Systems	3	40212101	
40322203	Visual Programming	3	40421203	
40352201	Fundamentals of Software Engineering	3	40342101	
40252202	IS Strategy, Management and Acquisition	3	40252201	
40322202	Programming of Internet Applications	3	40241202+ 40322101	
	University Core Requirement	3		
Total		18		



Year 3				
1 st Semester (Fall)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40213103	Algorithms Design and Analysis	3	40212101	
40353103	Software Project Management	3	40352201	
40223101	Database Programming	3	40252201	
40253102	Information Retrieval, Search, & Visualization	3	40252201	
	University Elective Requirement	3		
	Program Elective Requirement	3		
Total		18		

2 nd Semester (Spring)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40433201	Computer Networks	3	40241101	
40253206	Data warehouses and business intelligence	3	40252201	
40253204	IS Enterprise Architecture	3	40252202	
40253205	Information Systems Security	3	40322202	
	University Core Requirement	3		
	Program Elective Requirement	3		
Total		18		



Year 4				
1 st Semester (Fall)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40543204	Network Management and Security	3	40433201	
40254107	Data Mining for Business Intelligence	3	40253206	
40284101	Field Training on CIS	3	Complete 80 CH	
40294105	Applied Graduation Project (I)	1	Complete 90 CH	
	University Core Requirement	3		
	University Elective Requirement	3		
Total		16		

2 nd Semester (Spring)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40264401	Communication and Writing Skills	3		
40264206	Applied Graduation Project (2)	2	40294105	
40254208	Electronic Business and Commerce	3	40322202	
	University Elective Requirement	3		
	Program Elective Requirement	3		
Total		14		



Courses Description

40421108 Introduction to Programming

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -)

The fundamental concepts of programming using selected programming language such as C++. It covers basic structures of programming concepts such as variables, data types, control structures, arrays, functions, and pointers. A brief introduction to classes and objects is also given. Students will apply their gained knowledge in a series of assignments. Practical work for three hours weekly is included. The course includes complete a practical project or research by the students.

40421109 Laboratory of Introduction to Programming

(0 Credit Hours, Lecture: 0, Lab: 3, Corequisite: 40421108)

A practical laboratory in programming with selected programming language such as C ++, where it covers practical exercises in the basics of programming such as variables, data types, control statements, matrices, functions and indicators. In this course, students apply their knowledge through a series of practical assignments in the laboratory.

40241101 Fundamentals of Information Technology

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -)

Knowledge of the terminology, information systems environment, processes, and components associated with information technology, information Systems concepts, components, tools, and applications. It will provide an introductory understanding of computer hardware, numbering system and knowledge of how data is prepared for computer, instruction processed at a basic machine level, and software (operating systems, database, and web development and applications). It also introduces the networking, Internet, and the basics of the information security, web searching, in addition to algorithms and problem solving, the course includes complete a practical project or research by the students.

**40264401 Communication and Writing Skills****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -)**

Concepts of administrative communication and to develop some of the skills he needs in his private life and career, in addition to his definition of the basic concepts of communication as a core and vital in the life of business organizations. To achieve this, the course will deal with the following topics: the nature, importance and objectives of the communication process, trends, elements and channels of communication, obstacles to effective communication, the basis of successful correspondence writing. In addition to the recognition of listening skills and teamwork and the management of meetings and interviews, the course includes complete a practical project or research by the students.

40251102 Fundamentals of Management Information Systems**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -)**

Discussions and analysis of the role of information technology and management information systems within the recent global and dynamic business environment. The topics that will be covered in this course concerning the basic concepts of MIS, introduction to computer base information system, using IT and IS for competitive advantages, organization transformation, office automation and virtual organization, functional systems, system acquisition and development, executive information system, strategic information systems, decision support systems, knowledge base systems, managing data and computer security. The course includes complete a practical project or research by the students.

40253204 IS Enterprise Architecture**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40252202 IS Strategy, Management and Acquisition)**

The design, selection, implementation and management of enterprise IT solutions and the focus on applications, infrastructure, and their fit with the business. The topics that will be covered in this course concerning the frameworks and strategies for infrastructure management, system administration, data / information architecture, content management, distributed computing, middleware, legacy system integration, system consolidation, software selection, total cost of ownership calculation, IT investment analysis, and emerging technologies. The course includes complete a practical project or research by the students.



40421211 Object Oriented Programming
(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40421108 Introduction to Programming)

Object-oriented concepts (encapsulation, data abstraction, inheritance, and polymorphism) along with OO design using UML (unified modeling language). The OOP concepts covered using selected programming language such as java or C++. The course emphasizes on the concepts of classes, templates, friend classes, inheritance, abstract class and virtual functions, exceptions, and generic programming. Upon completion, students should be able to use an object-oriented language to develop rather complex programs, the course includes complete a practical project or research by the students.

40421212 Laboratory of Object Oriented Programming
(0 Credit Hours, Lecture: 0, Lab: 3, Corequisite: 40421211)

A practical laboratory in object-oriented programming, covering practical exercises in object-oriented programming (encapsulation, data abstraction, inheritance, polymorphism). The course is concerned with applying concepts of classes (classes and templates, friendly classes, inheritance, abstract layer and virtual functions, exceptions and general programming in a practical way). Students will apply their knowledge through a series of practical assignments in the laboratory.

40241202 Databases

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40241101 Fundamentals of Information Technology)

Basic concepts of databases and the main topics such as: database definition, database system; overview of database management, database system architecture, introduction to relational model, database algebra, database design, database integrity, an introduction to structured query language (SQL), mapping between ER- and EER-to-Relational, the course includes complete a practical project or research by the students.

**40241203 Laboratory of Databases****(1 Credit Hours, Lecture: 0, Lab: 3, Corequisite: 40241202)**

A practical laboratory in databases, covering practical exercises in database system and database management (relational database systems RDBMS, structured query language (SQL), and schema design techniques), the course includes complete a practical project or research by the students.

40312101 Discrete Mathematics**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 50551105 Principles of Mathematics and Statistics)**

Fundamental aspects of discrete mathematics used in computer science starting with propositions, logical operations, truth tables, set theory, relations and functions, and methods of proofs. The course also introduces the concepts of sequences, matrices, lattices, graph theory, and trees (rooted tree, subtree), the course includes complete a practical project or research by the students.

40212101 Data Structures**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40421211 Object Oriented Programming)**

Basic concepts of data structure and algorithm. The topics that will be covered in this course concerning Data type and structures; Abstract data types and encapsulation; Stacks; Queues; Recursion; Linked Lists; Binary trees; General trees; File organization: sequential and indexed files; Graphs: representation, traversing, shortest path; Sorting: exchange, insertion, quick sort, heap and others; Searching. At the end of this course, students will be able to select the proper data structure and algorithm to solve a specific software problem, the course includes complete a practical project or research by the students.

**40322101 Websites Design**

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40241101 Fundamentals of Information Technology)

Basic concepts of the World Wide Web, internet technology, current Web protocols, and client-server programming for desktop computers and smart phones. Students will learn standard Hypertext Markup Language (HTML) for create the web pages, basics of Cascading Style Sheets (CSS) for design and layout the web pages, as well as JavaScript, together with XML and JSON for data-interchange and Ajax technology for building rich internet applications for desktop computers and smart phones. Students will apply their gained knowledge in a series of practical assignments. At the end of this course, students will create and maintain a small web page project on a live web server for desktop computers and mobile devices.

40213103 Algorithms Design and Analysis

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40212101 Data Structures)

Basic concepts of designing and analyzing algorithms. Topics covered: review of abstract data types and data structures, definition of algorithms, classifying functions and computational complexities of algorithms, algorithms analysis & design techniques including: divide and conquer greedy methods, searching and sorting, trees, graphs, hashing, combinatorial algorithms and P/NP problems, the course includes complete a practical project or research by the students.

40223101 Database Programming

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40252201 Database Management Systems)

The use of DB Language (Oracle or SQL Server) to construct a database system. The students will learn how to use the various support tools for business applications (e.g., DDL and DML command, forms design, and trigger). At the end of this course, students will be able to install Oracle or SQL Server Database, Back up and recover data, Administer users and manage data, Transport data between databases, Understand the Oracle or SQL Server database architecture and how its components work and interact with one another, Use performance monitoring, database security, user management, and backup/recovery techniques. The course includes complete a practical project or research by the students.

**40252202 IS Strategy, Management and Acquisition****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40252201 Database Management Systems)**

Discussions of the management of information systems function in organizations and how the IS function enables / supports / integrates several types of the capabilities of organizations. Topics covered in this course include the acquisition, development and implementation of plans and policies to accomplish effective and efficient information systems. The course covers topics related to the definition of the high-level Information systems infrastructures and the systems that support the operational, administrative and strategic needs of the organization. At the end of this course, students will be able to work with methods related to the development of intellectual framework that will allow leaders of organizations to critically assess existing IS infrastructures and emerging technologies. The course includes complete a practical project or research by the students.

40252201 Database Management Systems**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40241202 Databases)**

The principles, design, implementation, architecture and applications of DBMS; Advanced Structured Query Language (SQL) such as: views, exit, with, create type, authorization, metadata, dynamic SQL, triggers, recursion; data dictionary; Normalization processes: 1NF, 2NF, 3NF and BCNF; DB Security; Modern DBMSs: Object-Oriented DBMSs; Physical Database design; Centralized and distributed Database systems. Advanced databases topics: Storage and File Structure, Indexing and Hashing, Transactions, Concurrency Control, and UML, the course includes complete a practical project or research by the students.

40253205 Information Systems Security**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40322202 Programming of Internet Applications)**

Information systems security and contemporary issues in information security and confidentiality problems, confidentiality models, methods to reduce risks and losses, information systems security within organizations, cryptography, information security control, information security programs, safe and reliable systems, user identification, network security case study. As you search on computer virus topics and methods of prevention, the course includes the implementation of an applied project or research by students.

**40253206 Data warehouses and business intelligence****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40252201 Database Management Systems)**

Introduction to IS environment, data warehouse design. Topics covered in this course are planning, requirements gathering for data warehousing, data warehouse architecture and design, dimensional model design for data warehousing, physical database design for data warehousing, extracting, transforming, and loading strategies. The role of data warehouse in supporting Decision Support Systems (DSS) is also reviewed. At the end of this course, students will be able to work with large datasets in a data warehouses environment and create visual analytics, dashboards, a leading BI tool, and OLAP (online analytical processing). The course includes complete a practical project or research by the students.

40254107 Data Mining for Business Intelligence**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40253206 Data warehouses and business intelligence)**

The understanding of the business intelligence concepts and the concepts and techniques for the discovery of patterns hidden in large data sets (focusing on issues relating to their feasibility, usefulness, effectiveness, and scalability). The development of new data mining methods, systems, and applications will be discussed. The students will know about recent developments in mining complex types of data, such as Types of data and their Pre-processing, Predictive Modeling, Classification, Decision Tree Induction, Descriptive Methods, Proximity, Association Analysis, Clustering, and Anomaly Detection and their applications. The course includes complete a practical project or research by the students.

**40254208 Electronic Business and Commerce****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40322202 Programming of Internet Applications)**

The fundamentals of e-business and e-commerce in terms of concept, elements, importance and functions, and its different models, both in the public sector, such as e-government or the private sector. It also includes the applications of government administration applications, challenges, opportunities, and determinants of application in the local environment, knowledge of e-business strategies, e-commerce e-marketing, e-learning and essential components of e-business management. In addition to the study of leading models in e-commerce and the privacy and security of electronic business, the course includes complete a practical project or research by the students.

40284101 Field Training on CIS**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: Complete 80 Credit Hours)**

Training is required for each student in one of the organizations for not less than six weeks, and 90 hours of training, the practice regulations are according to the training regulations issued and approved by the department, college and dean's council of the university, the course includes complete a practical project or research by the students.

40294105 Applied Graduation Project (1)**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: Complete 90 Credit Hours)**

Project includes theoretical and practical aspects related to the current problems and applications in CIS, applied research-oriented, technical report, and presentation.

This course requires students to gather in groups and decide on a project that needs to be carried out under the supervision of a faculty member. The “Graduation Project Guidelines” set by the department council regulates the steps and the time frame for starting and completing this course.

40294206 Applied Graduation Project (2)**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40294105 Applied Graduation Project (1))**

This course is a continuation of CIS 491 and is also subject to the regulations in the “Graduation Project Guidelines”.

**40322202 Programming of Internet Applications****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40322101 Websites Design + 40241202 Databases)**

The knowledge and the tools to design and implement internet web applications for desktop computers and smartphones using PHP language as a server-side language. Initially, the course will introduce HTML language and web applications. Students will learn about concepts of PHP, functionality of web server, install and configure Apache HTTP server or Microsoft IIS. This course goes over the syntax and usage of PHP language such as data types, operators, arrays, control statements, expressions, sessions, cookies, as well as create programs that interact with MySQL databases. At the end of this course, students will create and maintain a small web application project on a live web server for desktop computers and smartphones. The course includes complete a practical project or research by the students.

40322203 Visual Programming**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40421211 Object Oriented Programming)**

Fundamental concepts of visual programming (VP). Student will learn about VP concepts, event driven, and how to use VP to construct graphical user interface using Visual Basic.NET (VB.NET). This course covers an introduction to programming concepts and methods including the problem analysis and problem-solving techniques. Also, Data types, control structures, functions, syntax and semantics of the language, classes, class relationships, and exception handling will be covered. Connect to database could be covered, the course includes complete a practical project or research by the students.

40342101 Systems Analysis and Design**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40241202 Databases)**

Main concepts of the system development life cycle. Information gathering and reporting activities from the analysis phase through the maintenance and support phase will be covered. At the end of this course, students will be able to design, implement, and document the system development cycle. The main topics that will be covered are: introduction to systems development; development life cycle; system development feasibility; development of fact finding methods; context diagram; data flow diagram; decision tables and trees; data dictionary; installation; training; development tools: documentation, maintenance, conceptual design, DB design, reverse engineering, graphical user interface, systems life cycle, system conversion, system charts and flow of control. Case studies are used to emphasize the points covered, the course includes complete a practical project or research by the students.

**40352201 Fundamentals of Software Engineering**

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40342101 Systems Analysis and Design)

Knowledge of the Information Systems environment and develops strong foundation by covering topics including: Planning, requirements, analysis and specification, design; testing; debugging; maintenance; and documentation, the course includes complete a practical project or research by the students.

40353103 Software Project Management

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40352201 Fundamentals of Software Engineering)

Information systems project environment, project management phases, issues and techniques of project management, project evaluation and selection, scope of management, team building, stakeholder management, risk assessment, scheduling, quality, rework, negotiation, and conflict management. Professional issues including career planning, lifelong learning, software engineering ethics, and the licensing and certification of software project professionals, the course includes complete a practical project or research by the students.

40433201 Computer Networks

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40241101 Fundamentals of Information Technology)

Key Concepts of Computer Networks; Broad Range of Topics in Networking (e.g. Networks Applications, Network Classifications and Topologies, Network Layers, Channel Performance Measures, Transmission Media, Communication Network Protocols and Architecture); Data Link Layer (e.g. Framing, Error Detection and Correction, CSMA/CD, LAN IEEE Standards); Network Layer (e.g. IP service model, IP Addressing, Sub-netting, Host Configuration DHCP, ARP Protocol, ICMP protocol); Transport Layer (e.g. UDP Protocol, TCP Protocol, TCP Reliable Transfer and Sliding Window, TCP Flow and Congestion Control); Application Layer (e.g. DNS Protocol, NAT Protocol, HTTP Protocol, Persistent and Non-Persistent HTTP Connection) , the course includes complete a practical project or research by the students.

**40543204 Network Management and Security****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40433201 Computer Networks)**

Analytical and practical capabilities for computer networks' design, deployment, management, and security. Basic foundations of network management, the Simple Network Management Protocol in its different versions (SNMPv1, SNMPv2, and SNMPv3), Remote network Monitoring. Also, it focuses on Telecommunications Management Network, management tools and statistics measurement, management applications including configuration, performance, event correlation, security, reports, and service levels. The course includes complete a practical project or research by the students.

40212202 Operating Systems**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40212101 Data Structures)**

The definition and role of the operating systems. Topics spanned functionality and structuring methods of a typical operating system; Introduction to modern operating systems, including device control, interrupts, synchronization and inter-process communication, process scheduling, memory management and virtual memory, disk management, and security. The course includes complete a practical project or research by the students.

40253102 Information Retrieval, Search, & Visualization**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40252201 Database Management Systems)**

The environment of the information systems, theories, and methods for searching and retrieval of text and bibliographic information. Topics cover analysis of relevance and utility; Statistical and linguistic methods for automatic indexing and classification; Boolean and probabilistic approaches to indexing, query formulation, and output ranking; Filtering methods; Measures of retrieval effectiveness and retrieval experimentation methodology. At the end of this course, students will be able to work with systems and search engine, query transformation and interface design, Visualization literacy, Usability research, theories of visual perception and cognition, visualization models and visual analytics and data graphics. The course includes complete a practical project or research by the students

**40253104 Geographic Information Systems (GIS)****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40322202 Programming of Internet Applications)**

An introduction and overview of Geographic Information System (GIS), Concepts and Components, Geodesy and Map Projections, Data Entry and Editing, Global Navigation Satellite Systems, Aerial and Satellite Images, Tables and Relational Databases, Basic Spatial Analysis, Topics in Raster Analysis, Terrain Analysis, Interpolation and Spatial Estimation, Spatial Models. The course includes complete a practical project or research by the students.

40293201 Special Topics in CIS**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: Complete 60 CH)**

Special topics of current trends in CIS, the course includes complete a practical project or research by the students.

40254206 Emerging Topics in IT**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40254208 Electronic Business and Commerce)**

The emerging future technology issues and trends in CIS, the course includes complete a practical project or research by the students.

40253207 Decision support systems**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40253102 Information Retrieval, Search, & Visualization)**

The purpose of this course is to treat the essentials of discrete-event simulation methodology, and does so in the context of a popular Arena simulation environment. The course contains topics on the simulation modeling methodology and the underpinnings of discrete-event systems, as well as the relevant underlying probability, statistics, stochastic processes, input analysis, model validation and output analysis, and more detailed design for organizational operations and their analysis. All simulations-related concepts are illustrated in numerous Arena examples, encompassing production lines, manufacturing and inventory systems, and Health Information Systems Applications. An introduction into the application of Artificial Intelligence techniques in business will be given and the coverage will extend to include major characteristics of KBSs, the knowledge acquisition and representation, inference techniques, Expert System development tools and Case-Based reasoning.

**40253105 Entrepreneurship Systems**

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40253207 Decision support systems)

In this course, students will be introduced to the concept of Entrepreneurship system as a mean to improve their creativity and thinking skills beside their management skills. They will learn to be able to create their own vision, to lead with their vision, and to easily sell their own vision to be a real project.

40254205 Multimedia Technologies For CIS

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40322203 Visual Programming)

The theory and practice of multimedia information systems. The concepts and methods of the multimedia production cycle comprising the creation, description, retrieval, editing, management, distribution, and reuse of digital media will be presented. Current commercial and academic research systems for media production, editing, annotation, retrieval, and reuse. The design of next-generation multimedia information systems and prototypes.

50551105 Principles of Mathematics and Statistics

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -)

Introduction to functions, limits and continuity, derivatives and rules, techniques of differentiation. It also introduces also the science of statistics and statistical research methods, sampling and sample data collection and classification. It covers various topics in descriptive statistics, correlation and regression analysis, time series, index numbers, the course includes complete a practical project or research by the students.

50223121 Numerical Analysis

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 50551105 Principles of Mathematics and Statistics)

Introduction to the numerical analysis, and its primary objective is to develop the basic understanding of numerical algorithms and required skills to implement algorithms to solve mathematical problems, the course includes complete a practical project or research by the students.