جامعة الإسراء
ISRA UNIVERSITY

Faculty of Information Technology

Department of

Computer Science\Computer Multimedia Systems

Study Plan for the Bachelor Degree in Computer Science\Computer Multimedia Systems

2023 / 2024

Vision:

Leadership and distinction in computer Science according to international standards

Mission:

Preparing distinguished cadres in computer science capable of developing software according to the labor market and community service requirements.

Program Objectives:

1) Encouraging students to be creative and innovative in the fields of applications and development of computer programs
2) Promote the concepts of work ethics in the computer science environment
3) Development of qualified personnel to participate in software development through teamwork
4) Analyzing, applying, and evaluating issues related to computing systems and providing appropriate technical solutions.
5) Preparing qualified cadres in the field of networks/computer science/multimedia systems to serve the labor market locally and regionally
6) Activating students' role in the field of computerized e-learning and enabling them to acquire remote communication skills

1. Intended Learning Outcomes (ILOs):

a) Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.

b) Design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

c) Communicate effectively in a variety of professional contexts.

d) Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.

e) Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

f) Apply computer science theory and software development fundamentals to produce computing-based solutions. [CS].

2. **Framework for Computer Science\Computer Multimedia Systems Bachelor Degree (135 Cr. Hrs.)**

Classification	Credit Hours			Percentage
	Compulsory	Elective	Total	
University Requirements	12	12	24	18%
Faculty Requirements	21	-	21	16%
Program Requirements	72	9	81	60%
Support Courses	6	-	6	4%
Free Electives	3	-	3	2%
Total			135	100%

Course Coding:

0	6	0	2	year	semester	0-9	0-9
Faculty Code		Dept. Code		Course Level		Knowledge Field	Sequence

Knowledge Areas

Number	Knowledge Field	#Acr. Hrs in the Study Plan
0	**Computer and Algorithms Sciences** - Discrete Mathematics, Data Structure, Algorithms	**9**
1	**Programming** - Visual Programming, Object-Oriented Programming, Web Design (1), Web Design (2), Programming Methodology, Programming Fundamentals	**18**
2	**Computer Main Components** - Digital Logic Circuits, Operating Systems, Computer Organization and Design, Computer Architecture.	**12**
3	**Information Sciences and Applications** - Databases, Information Systems Analysis and Design, Database Systems Management.	**9**
4	**Networks** - Computer networks.	**3**
5	**Multimedia** - Virtual Vision, Visualization of Data, 2-D Animation, 3-D Animation, Sound and Picture Production, Computer Graphics, Multimedia Programming, Image Processing, Information Security, Information Retrieval Systems, Smartphone Programming, Multimedia systems	**33**
6	Computer Multimedia Systems Course - Games Systems	**3**
7	**Electives (**Minimum of 6 Credit Hours)	**27**

	- Human-Computer Interaction, Software Mathematics, E-Learning Systems, Digital Acoustics, Artificial intelligence, Multimedia In The Media, Selected Topics1, Selected Topics2	
8		
9	**Training / CMS (**3 Hrs of Training after completing at least 90 Hrs) **Graduation Project (**Graduation Project - 3 Hrs after completing at least 90 Hrs)	**6**

3. University Requirements: (24 Credit Hours)

3.1 Compulsory University Requirements: (12 Credit Hours)

Course No.	Course Title	Cr. Hr.	Prerequisite
01101111	Arabic Language/Remedial	0	-
01101112	English Language/ Remedial	0	-
01100051	Computer Skills/ Remedial	0	-
01101101	Military Sciences (Only for Jordanian *)	3	-
01101102	National Education (Only For Jordanian *)	3	-
01101111	Arabic Language	3	01100011
01101112	English Language	3	01100012
	Total	**12**	

3.2 Elective: 12 Credit Hours from the following courses.

Course No.	Course Title	Cr. Hr.	Prerequisite
01101103	Traffic Education	3	-
01101104	Leadership and creativity	3	-
01101121	Life skills	3	-
01101131	Islamic Culture	3	-
01101132	Jerusalem and the Hashemite Custodianship	3	-
01101141	Sport and Health	3	-
01101142	Environment and society	3	-
01101151	Computer Skills	3	01100051
01101152	Internet and Communication	3	-
01101161	Economic Systems and Concepts	3	-
01101171	Psychology and Society	3	-
01101213	Communication Skills in Arabic Language	3	01101111
01101214	Communication Skills in English Language	3	01101112
01101243	Public safety and first aid	3	-
01101281	Scientific Research Methods	3	-
01101282	Introduction to Astronomy	3	-
03011101	Law in our Life	3	-
03021201	Human Rights	3	-

4. Faculty Requirements: (21 Credit Hours)

4.1 Compulsory Faculty Requirements: (21 Credit Hours)

Course No.	Course Title	Cr. hr.	Theoretical	Practical	Prerequisite
11021101	General Physics (1)	3	3	-	-
11031101	Calculus (1)	3	3	-	-
06051110	Programming Methodology	3	3	-	-
06051200	Discrete Mathematics	3	3	-	-
06051220	Logic Design	3	2	2	11021101
06051211	Programming Fundamentals	3	2	2	06051110
06032102	Data Structures	3	2	2	06051211
	Total	**21**			

5. Department Requirements (81 Credit Hours)

5.1 Compulsory Department Requirements: (72. Credit Hours)

Course No.	Course Title	Cr. hr.	Theoretical	Practical	Prerequisite
06052232	Information systems analysis and design	3	3	-	06032112
06032112	Object Oriented Paradigm	3	2	2	06051211
06052201	Algorithms	3	3	-	06052102
06032122	Computer Architecture	3	3	-	06051220
06033113	Visual Programming	3	3	-	06032112
06053214	Web Design (1)	3	2	2	06032112
06014115	Web Design (2)	3	2	2	06013214
06053130	Databases	3	2	2	06012201
06053223	Operating System	3	3	-	06032122
06052221	Computer Organization and Design	3	3	-	06032122
06022173	Multimedia Systems	3	3	-	---
06022251	Sound And Picture Production	3	3	-	06022173
06022252	Two-dimensional animation	3	3	-	06022157
06024154	Virtual Vision	3	3	-	06023158
06023254	Data Visualization	3	3	-	06033113
06033274	Human Computer Interaction	3	3	-	06033113
06023256	Three-dimensional Animation	3	3	-	06022252
06052157	Computer Graphics	3	3	-	06051211
06024290	Practical Training	3	3	-	Pass. 90 Hrs
06024191	Multimedia Graduation Project	3	3	-	Pass. 90 Hrs
06013256	Smart Phone Programming	3	3	-	06033113
06023158	Multimedia Programming	3	3	-	06022252
06053259	Image Processing	3	3	-	06052253
06024160	Games Designing	3	3	-	06023256

Course No.	Course Title	Cr. hr.	Theoretical	Practical	Prerequisite
	Total	**72**			

5.2 Department Electives: (9 Credit Hours)

Course No.	Course Title	Cr. hr.	Theoretical	Practical	Prerequisite
06042150	Information Security	3	3	-	**11031141**
06013231	Database Systems Management	3	2	2	**06053130**
06014254	Information Retrieval Systems	3	3	-	06053130
06023173	E-learning Systems	3	3	-	06022173
06033172	Software Mathematics	3	3	-	06052112
06023274	Digital Acoustics	3	3	-	06022251
06013176	Artificial Intelligence	3	3	-	06052201
06052140	Computer Networks	3	3	-	06051220
06024277	Multimedia In The Media	3	3	-	06022173
06014171	Selected Topics (1)	3	3	-	Dept. Approval
06054272	Selected Topics (2)	3	3	-	Dept. Approval
	Total	**9**			

6. Support Courses (6 Credit Hours)

Course No.	Course Title	Cr. hr.	Theoretical	Practical	Prerequisite
11031141	Statistics and Probabilities	3	3	-	11031101
06052253	Numeric Analysis	3	3	-	11031101
	Total	**6**			

7. Free Electives: 3 Credit Hours

Study Plan Guide for the Bachelor Degree in Computer Sciences\Computer Multimedia Systems

First Year					
First Term					
Course No.	**Course Title**	**Cr. hrs.**	**Theoretical**	**Practical**	**Prerequisite**
01101111	Arabic Language	3	3	-	01100012
11021101	General Physics 1	3	3	-	-
06051110	Programming Methodology	3	3	-	-
11031101	Calculus (1)	3	3	-	-
01101112	English Language	3	3	-	01100011
	Total	**15**			

Second Term					
Course No.	**Course Title**	**Cr. hrs.**	**Theoretical**	**Practical**	**Prerequisite**
11031141	Statistics and Probabilities	3	3	-	11031101
06051211	Programing Fundamentals	3	2	2	06051110
06051220	Logic Design	3	2	2	11031101
06051200	Discrete Mathematics	3	3	-	-
01101102	National Education (Only For Jordanian *)	3	3	-	
	University Elective Req	3	3	-	
		18			

Second Year					
First Term					
Course No.	**Course Title**	**Cr. hrs.**	**Theoretical**	**Practical**	**Prerequisite**
06012273	Multimedia Systems	3	**3**	**-**	-
06032112	Object Oriented Paradigm	3	2	2	06051211
06052157	Computer Graphics	3	3	-	06051211
06032102	Data Structure	3	3		06051211
06032122	Computer Architecture	3	3	-	06051220
	University Elective Req	3	3	-	
	Total	**18**			
Second Term					
Course No.	**Course Title**	**Cr. hrs.**	**Theoretical**	**Practical**	**Prerequisite**
06022252	Two-dimensional animation	3	3	-	06052157
06052201	Algorithms	3	2	2	06032102
06052232	Information Systems Analysis and Design	3	3	-	06032112
06052221	Computer Organization and Design	3	3	-	06032122
06022251	Sound And Picture Production	3	3	-	06022173
	Free Course	3	3	-	
	Total	**18**			

Third Year					
First Term					
Course No.	**Course Title**	**Cr. hrs.**	**Theoretical**	**Practical**	**Prerequisite**
06023158	Visual Programming	3	3	-	06022252
06023158	Multimedia Programming	3	3	-	06022252
06053130	Database(1)	3	2	2	06052201
06052253	Numerical Analysis	3	3	-	11031101
06012201	Algorithms	3	3	-	06032102
	Specialization Elective 1	3	3	-	
	Total	**18**			
Second Term					
Course No.	**Course Title**	**Cr. hrs.**	**Theoretical**	**Practical**	**Prerequisite**
06053259	Image Processing	3	3	-	06052253
06023254	Data Visualization	3	3	-	06033113
06033274	Human Computer Interaction	3	3	-	06033113
06023256	Three-Dimensional Animation	3	3	-	06022252
06053214	Web Design (1)	3	2	2	06032112
06053223	Operating System	3	3	-	06032122
	Total	**18**			

Fourth Year					
First Term					
Course No.	**Course Title**	**Cr. hrs.**	**Theoretical**	**Practical**	**Prerequisite**
06024153	Virtual Vision	3	3	-	06023256
06024160	Games Designing	3	3	-	06023256
06014115	Web Design (2)	3	2	2	06053214
06024290	Practical Training for CMS	3	3	-	Pass 90 Cr.hr.
06013256	Smartphone Programming	3	3	-	06033113
	University Elective Req		**3**	**-**	
	Total	**18**			
Second Term					
Course No.	**Course Title**	**Cr. hrs.**	**Theoretical**	**Practical**	**Prerequisite**
-	Specialization Elective 2	3	3	-	
06024191	Multimedia-Graduation Project	3	3	-	Pass 90 Cr.hr.
01101101	Military Sciences (Only for Jordanian *)	3	3	-	-
	Specialization Elective 3	3	3	-	-
	Total	**12**			

Description of Courses offered by the Department of Computer Science\Computer Multimedia Systems.

11021101 **General Physics (1) (Prerequisite: - none)** **(3) Cr. Hrs**

Vectors, Basics of Mechanics Description of Motion in One Dimension, Motion in two Dimensions, Applications of Newton's Laws, Work-Energy Theorem, Collisions, and Rotational Motion

11031101 **Calculus (1) (Prerequisite:- none)** **(3) Cr. Hrs**

Functions and Limits, Continuous functions, derivative, differentiation rules, implicit differentiation, applications integrals, definite integrals, transcendental functions, inverse trigonometric functions.

06051110 **Programming Methodology (Prerequisite: - none)** **(3) Cr. Hrs**

Problem-solving concepts: constants and variables, data types, problem-solving steps, expressions, problem-solving tools, algorithms, flowcharts, pseudo-code, programming logic structures (sequential, decision, and loops), Arrays.

06051200 **Discrete Mathematics (Prerequisite: - none)** **(3) Cr. Hrs**

Introduces discrete structures and techniques for computing. Sets, graphs, and trees. Functions, relation properties, recursive definitions, solving recurrences, equivalence, partial order. Proof techniques, inductive proof counting techniques, and discrete probability

06051220 **Logic Design (Prerequisite: -** 11021101**)** **(3) Cr. Hrs**

- 2 Theoretical
- 2 Practical

Number systems, computer codes. Boolean algebra and logic gates. Simplification of Boolean functions, Karnaugh map, combinational logic implementation including PLAs, (adders, comparators, coders, decoders, code converters, multiplexers, de-multiplexers). Sequential circuits, flip flops, counters, shift registers, memories

06051211 **Programming Fundamentals (Prerequisite: -** 06051110**)** **(3) Cr. Hrs**

- 2 Theoretical
- 2 Practical

Fundamental concepts of programming using C++, C# or Java: classes and objects, modeling object (attributes and behaviors), algorithms, problem-solving flowcharts, pseudo-codes. Basic blocks of programming such as variable names, data types, control structures, functions, arrays.

06052201 **Algorithms (Prerequisite: -** 06032102**)** **(3) Cr. Hrs**

Introduction to the design and analysis of algorithms, mathematical algorithms. Greedy technique, manipulating data: sorting, searching, dynamic programming, space & time tradeoffs. The concept of algorithm efficiency, table, and information retrieval. Combinatorial problems, advancement in Java skills and techniques

06052232 Information Systems Analysis & Design (Prerequisite:-06032112**) (3) Cr. Hrs**

System Theory, information systems, and information systems types, system analysis and design methods object-oriented system analysis and design methods. Study cases.

06032112 Object Oriented Paradigm (Prerequisite: - 06051211**)** **(3) Cr. Hrs**

- 2 Theoretical
- 2 Practical

Introduction to OOP, models, objects, methods, links, message passing, polymorphism, dynamic binding, classes constructors and destructors, association, generalization and specialization, inheritance, overridden methods, aggregation. Students are required to perform some lab experiments using the latest JAVA language version and UML using Rational Rose software.

06032102 Data Structures (Prerequisite: - 06051211**)** **(3) Cr. Hrs**

- 2 Theoretical
- 2 Practical

Algorithmic problem solving, Data Structures (static & dynamic), lists, stacks, queues, graphs, trees, sets, and dictionaries). Recursion and iteration. Students are expected to do lab experiments using C#, C++, or Java.

06032122 Computer Architecture (Prerequisite: -06051220**)** **(3) Cr. Hrs**

Hardware components of a modern computer system, history, and performance, the instruction cycle, memory organization, cache memory, I/O organization, CPU, micro-programmed control, instruction formats, and modes

06033113 Visual Programming (Prerequisite: - 06032112**)** **(3) Cr. Hrs**

Basic Visual Programming, solid foundation of the syntax and semantics of a visual Programming language used to develop both windows-based and web-based applications. Coverage of Microsoft's. NET platform architecture.

06053214 **Web Design (1) (Prerequisite: -** 06032112**)** **(3) Cr. Hrs**

- 2 Theoretical
- 2 Practical

Basic concepts of the Internet and Internet browsers, Internet applications, web page creation tools and languages. Basic XHTML (frames, forms), cascading style sheets, scripting and scripting languages. Dynamic XHTML (object based programming and events). Students are required to do a Mini- project.

06014115 **Web Design (2) (Prerequisite: -**06013214**)** **(3) Cr. Hrs**

- 2 Theoretical
- 2 Practical

This unit introduces students to the design, development, and implementation of server-side applications, the use of multimedia, and human interaction on the browser side. Students gain practical experience creating dynamic web applications that interact with a database using client-side scripts, server-side scripts, and compiled server programs. Security, access right, financial transactions, and legal issues are also covered. This unit incorporates substantial practical experience in applying theoretical concepts. Students are required to submit a mini-project.

06053130 **Databases (Prerequisite: -** 06052201**)** **(3) Cr. Hrs**

- 2 Theoretical
- 2 Practical

An in-depth examination of relational databases, modern database technologies, conceptual design, and entity-relationship modeling, relational algebra and calculus, data definition and manipulation languages using SQL, schema and view management, query processing and optimization, transaction management, security, privacy, integrity, and management. Students are required to do project work.

06053223 **Operating System (Prerequisite: -** 06032122**)** **(3) Cr. Hrs**

Definition of operating system, review of hardware, software and firmware, process concepts, asynchronous concurrent processes, real storage, virtual storage, processor scheduling, distributed computing, disk performance optimization.

06052221 **Computer Organization and Design (Prerequisite: -** 06032122**)** **(3) Cr. Hrs**

Explores the levels of architecture and organization in digital computers: logic circuit design, integrated circuits, and assembly language coding.

06022173 **Multimedia Systems (Prerequisite: -** None**)** **(3) Cr. Hrs**

Introduction to the study and creation of multimedia, using various software programs. Students will learn both the aesthetic and technical aspects of multimedia design and production. Students will be introduced to Web production and the business process behind multimedia, working in teams to produce a Web-based product for real business clients. Students will use software programs such as Macromedia Dreamweaver, Flash, Director, and Adobe Photoshop.

06022251 Sound And Picture Production (Prerequisite: - 06022173**) (3) Cr. Hrs**

This course is concerned with assembling, adjusting, and operates various audio and video components, including cameras, microphones, lights, and sound mixers. Fundamentals of video shooting, sound, lighting, and editing, among other production issues will be covered. Students will know how to compose text, images, graphics, charts, audio, and videos to produce a short film.

06022252 Two-dimensional animation (Prerequisite: - 06052157**) (3) Cr. Hrs**

Creation of animation and dynamic interactive media for web and multimedia applications. Students will learn how to animate objects, create symbols, and assemble motion teens. However, this course focuses on the animation objects of 2-D images.

06024153 Virtual Vision (Prerequisite: - 06023158**) (3) Cr. Hrs**

Introduce the students to the new concepts, techniques and applications of virtual reality in multimedia and engineering. The major areas of study include an overview of virtual reality systems, both hardware and software, and computer graphics techniques used to simulate virtual environments. Problems relating to interacting with the virtual world, including depth perception, the selection of objects, and the movement of objects are studied. Also, problems relating to the interaction and collision of objects within the environment are studied.

06023254 Visualization of Data (Prerequisite: - 06033113**) (3) Cr. Hrs**

Define data visualization, and how to re-represent data in clear graphics. Design and create data scenarios using available and important data to be achieved. Explain data modeling and processing (eg aggregation and filtering), a visual coding, and data mapping of graphic features. How to evaluate the effectiveness of perception scenarios and criticism of design decisions (color selection and visual coding) will be illustrated. Practical part: Use data visualization tools (can be D3.js) to solve problems.

06033274 Human-Computer Interaction (Prerequisite: - 06033113**) (3) Cr. Hrs**

Tools and techniques for designing, implementing, deploying, and evaluating of user interfaces. Interactive systems; dialogue styles, theories of interaction and component integration, human-computer interaction frameworks.

06023256 Three-dimensional Animation (Prerequisite: - 06022252**) (3) Cr. Hrs**

Basic concepts of 3D modeling and animation using special software to produce three-dimensional computer animations and the different approaches to modeling in a 3D environment. Familiarization with both the interface and the production process of 3D animation. Texture mapping, lighting, and rendering of simple animations and environments.

06052157 **Computer Graphics (Prerequisite: -** 06051211**)** **(3) Cr. Hrs**

Introduction and fundamentals of computer graphics. Lines and circles algorithms. Geometrical transformation in two - dimensions and three - dimensions (Translation, Scaling, Rotation). Composing transformations, projection, methods for forming two- dimensional views using curves. Students are required to do lab Assignments.

06024290 **Practical Training for CMS (Prerequisite: -** Pass 90 Cr.hr.**)** **(3) Cr. Hrs**

Practical training in the public or private sector for at least 8 weeks

06013256 **Smartphone Programming (Prerequisite: - 06033113)** **(3) Cr. Hrs**

This course allows students to learn the fundamentals of programming for smartphones. It covers various concepts related to layouts, widgets event handling, processing JSON files, using MySQL database with PHP service. The course allows students to be familiar with the mainstream of today's technology.

06024190 **Multimedia - Graduation Project (Prerequisite: -**Pass 90 Cr.hr.**)** **(3) Cr. Hrs**

The student picks one of the projects posted by the department as part of the requirements of graduation.

06023158 **Multimedia Programming (Prerequisite: -** 06022252**)** **(3) Cr. Hrs**

The main objective of this course is to introduce the student to the basic programming tools of Multimedia systems. This course provides students with a comprehensive study of Multimedia Programming. The course stresses the object paradigm including classes, inheritance, virtual functions, and templates in the development of viewing images, playing videos & audio, and building a rich text environment. Lab exercises are required.

06053259 **Image Processing (Prerequisite: -** 06052253**)** **(3) Cr. Hrs**

This course provides the fundamentals of digital image processing. It emphasizes general principles of image processing, rather than specific applications. The covered topics are image acquisition and display, properties of the human visual system, color representations, sampling and quantization, point operations, linear

image filtering, and correlation, transforms and sub-band decompositions, and nonlinear filtering, image compression using various methods.

06024160 Games Designing (Prerequisite: - 06023256**) (3) Cr. Hrs**

Provide the students with knowledge of the game industry and also the experience in playing games and creating their own games. The Definition of a "Game", the Psychological Influence in Game Playing, The Difference between Good Games and Bad Games, Defining Good Game-play, Playability and Replay Value, Emotional Effects in Playing Games, Determining the Quality of a Game.

11031230 Statistics and Probabilities (Prerequisite: - 11031101**) (3) Cr. Hrs**

Definitions and basic elements of probability, Rules of probability, Random Variables: Discrete and continuous random variables and their probability distribution functions, the mathematical expectation. Some discrete and continues distributions: Binomal, Poisson, geometric, Hyper geometric and Normal Distributions. Point and interval estimation of the parameters of one and two populations. Tests of hypotheses concerning the above parameters, and Goodness of fit and independence tests. Simple linear Regression and inference concerning its parameters multiple linear regression: Description and estimate using matrices.

06052253 Numeric Analysis (Prerequisite: - 11031101**) (3) Cr. Hrs**

The error calculation, roots of nonlinear equations, use of numerical methods to solve systems of linear equations, approximation Functions, Find derivatives, find the values of numerical integrals by numerical methods, the use of numerical methods to solve differential equations

06042150 Information Security (Prerequisite: - 11031141**) (3) Cr. Hrs**

Information security basics, basic cryptography, modern symmetric ciphers, public-key cryptosystems, key management, message authentication, hash functions, digital signatures, IP and web security, firewalls and trusted systems, secured software design, application security software threats, social, legal, and ethical issues. Human security factors.

06013231 Database Management Systems (Prerequisite: - 06053130**) (3) Cr. Hrs**

- 2 Theoretical
- 2 Practical

Application development, integrated application, XML standards distributed database processing, and view support. Data protection problems, recovery, concurrency, security, and data integrity. Database administration and tuning, all practical applications shall be implemented in ORACLE.

06014254 Information Retrieval Systems (Prerequisite: - 06053130**) (3) Cr. Hrs**

Consideration of the basic principles and tools for analysis and retrieval of information in various information systems (textual and Database systems). Topics include differences between data retrieval and information retrieval, retrieval concepts, types of retrieval systems, web search architecture, tokenization, and query operations.

06023173 E-Learning Systems (Prerequisite: - 06022173**) (3) Cr. Hrs**

Fundamentals and techniques of e-Learning systems, e-learning theoretical background, models of e-learning modules, theories of learning convenient to e-learning modules, e-learning methodology, tutorial, drill & practice, problem-solving, e-exam, dialog, instructional simulation, instructional computer games, intelligent learning, e-learning strategies, Authoring e-learning systems, e-learning for handicapped students, Criteria of evaluating e-learning systems and instructional websites design.

06023274 Digital Acoustics (Prerequisite: - 06012273**) (3) Cr. Hrs**

Techniques for the creation of special effects of visual and audio objects on 2D and 3D graphics through digital compositing for film and video. Merging original 2D images such as photographs or other still images generated in Photoshop or Corel Painter with 3D models created in Alias' Maya program. Different output formats and uses for these compositing techniques in diverse industries.

06053176 Artificial intelligence (Prerequisite: -06052201**) (3) Cr. Hrs**

Introduction to Artificial Intelligence, symbolic reasoning and knowledge representation techniques, control strategies, heuristic search, and AI applications (expert systems, neural language processing, robotics…etc.). Introduction to neural networks, genetic algorithms, and machine learning.

06082140 Computer Networks (Prerequisite: - 06051220**) (3) Cr. Hrs**

Logical and physical of computer networks, architecture and transmission alternatives. OSI-reference model, ALOHA protocol, CSMA protocols, LAN, IEEE standards and protocols (token ring, token bus, and Ethernet), physical layer basics, data link layer, framing protocols, error detecting and correcting, routing algorithms, flow control, congestion control algorithms, personal computer networks.

06024277 Multimedia In The Media (Prerequisite: - 06022173**) (3) Cr. Hrs**

Provides the students with technical and practical skills in developing digital advertisements via the website and digital media using multimedia objects and effects (Text, audio, visual, images, and animation). Objective To expose students to the skills of applications and the techniques in the art of advertisement. Topics to be covered include Text and audio, image and video, the art of multimedia, multimedia over the network, advertisement on websites.

06014171 **Special Topics (1) (Prerequisite: -** Dept. Approval**)** **(3) Cr. Hrs**

To be set by the department.

06054272 **Special Topics (2) (Prerequisite: -** Dept. Approval **)** **(3) Cr. Hrs**

To be set by the department.

06033172 **Software Mathematics** **(Prerequisite:** -06032112**)** **(3) Cr. Hrs**

Introduction to MATLAB infrastructure. Working with linear algebra, arrays, and matrices. Graphics: plotting, images, and GUI. Use of symbolic Math toolbox: flow control, data structures, scripts, functions, and calculus. Solving equations.