الخطة الدراسية لقسم الحاسب الآلي

Curriculum Study Plan Table

* Prerequisite – list course code numbers that are required prior to taking this course.

Level	Course Code	Course Title	Required or Elective	* Pre-Requisite Courses	Credit Hours	University, College or Department
Prep Year Level 1	MS111	Mathematics I	**Required**		3 (2,2,0)	preparatory
	ENG125	English I	**Required**		3 (2,0,2)	preparatory
	IT130	Computer Skills	**Required**		3 (2,0,2)	preparatory
	ENG139	Computer Terminology	**Required**		2(2,0,0)	preparatory
	COM105	Communication and Study Skills	**Required**		3 (2,0,2)	preparatory
Prep Year Level 2	MS102	Mathematics II	**Required**	MS111	3 (2,2,0)	preparatory
	ENG126	English II	**Required**	ENG125	6(4,2,2)	preparatory
	CS202	Basic of Programming and algorithm	**Required**	IT130	3 (2,0,2)	preparatory
	IT304	Internet Technology	**Required**	IT130	3 (2,0,2)	preparatory
	PHS100	Physic	**Required**		3 (2,0,2)	preparatory
Level 3	ISLAM 101	Islamic Culture 1	Required	-	2 (2,0,0)	**University**
	MS 210	Principles of Probabilities & Statistics	**Required**	MS111	3 (2,2,0)	**College**
	IT 201	Introduction to Database Systems	**Required**	CS 101	3 (2,0,2)	**College**
	CS 211	Digital Logic Design	**Required**	MS111	3 (2,2,0)	**College**
	CS 212	Programming Language I	**Required**	CS202	3 (2,0,2)	**College**
	IT 202	Networks 1	**Required**	IT 101	3 (2,0,2)	**College**
Level 4	ISLAM 102	Islamic Culture 2	**Required**	-	2 (2,0,0)	**University**
	MS 207	Discrete Mathematics	**Required**	MS 111	3 (2,2,0)	**College**
	CS 213	Programming language II	**Required**	CS 212	3 (2,0,2)	**College**
	CS 215	Database Management Systems	**Required**	IT 201	3 (2,0,2)	**College**
	IS 221	System Analysis & Design	**Required**		3 (2,0,2)	**College**
	IT203	Computer architecture and organization	**Required**	CS211	3 (2,0,2)	
Level 5	IT 204	Web Programming	**Required**	IT304, CS 213	3 (2,0,2)	**College**
	CS 219	Data Structure	**Required**	CS 213	3 (2,0,2)	**College**
	CS 220	Introduction to Software Engineering	Required	CS215, IS 221	3 (2,0,2)	**College**
	CS 205	Operating Systems	**Required**	IT 203	3 (2,0,2)	**College**

	ISLAM 103	Islamic Culture 3	**Required**	-	2 (2,0,0)	**University**
	CS 208	Artificial Intelligence	**Required**	MS 207, CS215	3 (2,0,2)	**Department**
Level 6	ARAB 101	Arabic Language Skills	**Required**	-	2 (2,0,0)	**University**
	CS353	Computer Graphics	**Required**	CS 212 , CS 213	3 (2,0,2)	**Department**
	CS301	Microprocessor & Assembly Language	**Required**	IT203	3 (2,0,2)	**Department**
	IT305	Networks II	**Required**	IT202	3 (2,0,2)	**Department**
	IT410	Multimedia and Web Technologies	**Required**	IT402	3 (2,0,2)	**Department**
	IS322	Information Security	**Required**	CS205	3 (2,0,2)	**College**
Level 7	ARAB 103	Arabic Writing	**Required**	-	2 (2,0,0)	**University**
	CS410	Compilers	**Required**	CS 301	3 (2,0,2)	**Department**
	CS411	Design and Analysis of Algorithms	**Required**	MS 207, CS 219	3 (2,0,2)	**Department**
	CS412	Human-Computer Interaction	**Required**	IT204, IS221,CS220	3 (2,0,2)	**Department**
	CS432	Selected Studies in Computer Sciences I	**Elective**		3 (2,0,2)	
	CS488	Graduation Project (1)	**Required**		3 (3,0,0)	**Department**
	IS477	Training field	**Required**		2 (0,0,2)	**Department**
Level 8	CS420	Modelling And Simulation	**Required**	CS 207 , CS 213	3 (2,0,2)	**Department**
	CS421	Cryptography	**Required**	IS322	3 (2,0,2)	**Department**
	CS 423	Computer Ethics	**Required**	-	3 (2,0,2)	**College**
	CS499	Graduation Project (2)	**Required**	CS488	3 (2,0,2)	**Department**
	CS443	Selected Studies in Computer Sciences II	**Elective**		3 (2,0,2)	
	Include additional levels if needed (i.e. summer courses).					

Description of courses

MS111- Mathematics I

This course is designed to develop the topics of differential and integral calculus. Emphasis is placed on limits, continuity, derivatives and integrals of algebraic and transcendental functions of one variable. Upon completion, students should be able to select and use appropriate models and techniques for finding solutions to derivative related problems.

ENG125- English I

The course is intended to equip the students with reasonable skills necessary for successful communication in both oral and written forms of the language. At the end of the course, students are expected to acquire the sub-skills such as reading or listening for gist or specific information, and use vocabulary in a meaningful context.

IT130- Computer Skills

Overview of computer systems—hardware, operating systems, and microcomputer application software, including the Internet, word processing, spreadsheets, presentation graphics, and databases. Current issues such as the effect of computers on society, and the history and use of computers in business, educational, and other modern settings are also studied, keyboarding proficiency.

ENG139- Computer Terminology

This course is intended for computer science students in order to upgrade their knowledge of English in a professional context.

COM105- Communication and Study Skills

يتناول مقرر المهارات الحياتية والأكاديمية لطالبات المستوى الاول عدد من المهارات التي يحتاجها الطالب الجامعي مثل مهارات الاتصال والتواصل، وإدارة الوقت، التفكير العلمى والبحث، والاستذكار الجامعي والعمل التطوعي المجتمعي. ويقوم الطالب في هذا المقرر بالممارسة العملية لهذه المهارات من خلال منهجية التعلم لإثراء المخرجات التعليمية الأكاديمية وفي الوقت ذاته تعلُم مفهوم المسئولية المجتمعية والمساهمة في تقوية المجتمعات وبناء المهارات القيادية والمهنية لدى الطالب، وتعزيز مفهوم الاهتمام بالآخرين والتواصل الاجتماعي مع الاخرين .

MS102-Mathematics II

This course is designed to develop the topics of linear algebra, systems of linear equations, matrices, determinants, vector spaces, inner product spaces, eigenvalues and eigenvectors, and linear transformations.

ENG126 –English II

The course is intended to equip the students with reasonable skills necessary for successful communication in both oral and written forms of the language. At the end of the course, students are expected to acquire the sub-skills such as reading or listening for gist or specific information, and use vocabulary in a meaningful context.

CS202- Basic of Programming and algorithm

This course gives an introduction about algorithms and programming. The course gives an overview about what an Algorithm is, how it can be designed, approaches for solving computational problem and finally a first interaction of student with computer programming to solve the problems using JAVA.

IT304 –Internet Technology

This course presents the Internet from a dynamic workplace perspective. Reflects on how emerging technologies will empower society to do more with the Internet. Covers core Internet technologies, Web page design and authoring, computational thinking, networking fundamentals, and technology planning.

PHS100- Physic

General Physics I is the first of a two semester sequence in General Physics designed to present concepts and applications of the following topics: kinematics, dynamics, gravitation, energy, momentum and heat. There are three hours of lecture and two hours of laboratory each week.

ISLAM 101 Islamic Culture 1

يهدف هذا المقرر إلى ترسيخ العقيدة الإسلامية الصحيحة، ربط الأجيال المسلمة بمصادر الإسلام الأساسية، تحويل ما يأخذه المتعلم من معارف إلى واقع حي في سلوكه، تعريف الشباب بما يحيط بهم من المخاطر المعاصرة، إيجاد الحلول الإسلامية المناسبة للمشكلات من حولهم مع رد شبهاتها.

MS 210 Principles of Probabilities & Statistics

This course introduces fundamental concepts of probability and statistics. It provides the background for studying the uncertainty in computer problems. It introduces some methods for statistical inference. This course presents basic statistical principles and methods. It focuses on descriptive statistics, probability theory، Binomial, Poisson, z, t, and Chi-square distributions, central limit theorem, confidence intervals and hypothesis testing. One hr/wk is spent in the microcomputer laboratory exploring software applications of statistical concepts presented in the lecture. No previous computer experience is assumed.

CS 201 Introduction to Database

This course covers a wide array of topics such as characteristics and advantages of the database management systems (DBMS), concepts of database and its architecture, data models, database schemes and instances, database models, relational data model (ER-diagram) and SQL (Structured Query Language); including data definition, queries, update, statements, and views in SQL, database design; functional dependencies, normal forms, and relational algebra, relational model constraints; domains, keys, and integrity constraints.

CS 211- Digital Logic Design

This course presents the introductory concepts that are needed in order to design digital systems. Classical methods, including Number system, Boolean algebra, gate level design, combinational and sequential logic design methods. The lab experiments will involve the design and implementation of digital circuits. Emphasis is on the use computer aided tools in the design, simulation, and testing of digital circuits.

CS 212 Programming Language I

This course is an introductory course of JAVA programming and is one of the core courses for computer programming. Topics focus on the programming essentials using java, object oriented concepts of java, inheritance, polymorphism, encapsulation and abstraction etc, and problem solving by programming.

IT 202 Networks 1

This course presents an overview of the technology, architecture and software used by systems of network connected computers. The course will cover data transmission, local area network architecture, network protocols, inter-networking and distributed systems.

ISLAM 102 Islamic Culture 2

التعريف بنظامي المجتمع والأسرة في الإسلام، معرفة أسس بناء المجتمع المسلم، وسماته، وأسباب تقوية الروابط الاجتماعية بين أفراد المجتمع، معرفة أهم المشكلات الأسرية والاجتماعية، الإلمام بالخطبة وأحكامها العامة، التعرف على النكاح ومقاصده وآثاره المترتبة عليه، التعرف على أحكام فرق النكاح في الإسلام، إبراز حكم التشريع في عموم هذا المقرر.

MS 207- Discrete Mathematics

Introduction to Computer Applications is designed to familiarize students with computers and their applications. It will also emphasize the use of computers and technology throughout their high school, college, and future careers. Students will learn fundamental concepts of computer hardware.

CS 213- Programming language II

The goal of this course is to take students from core java(212 عال (to the advanced level of java programming .This course covers the advanced topics of java programming (Advanced Class Design ,JAVA Stream , File and I/O Fundamentals –,Generics and Collections – Multithreaded Programming, AWT and event handling, Swing and GUI, Applet and Java Beans etc.)

CS 215 Database Management Systems

This course include a wide array of topics, the main objective of this course is to expose the student to the various ideas of database design concept, storage and file structure, indexing and hashing techniques, query processing and optimization, transaction processing, concurrency control, and recovery system.

IS 221 System Analysis & Design

System analysis and design deal with planning the development of information systems through understanding and specifying in detail what a system should do and how the components of the system should be implemented and work together. System analysts solve business problems through analyzing the requirements of information systems and designing such systems by applying analysis and design techniques. This course deals with the concepts, skills, methodologies, techniques, tools, and perspectives essential for systems analysts. The practical components of this course are object oriented and use-case driven, requiring students to go through the steps of system analysis and design to solve a real-life business problem.

IT203 Computer architecture and organization

Main concepts of computer architecture; Hardware components of a computer; Instruction set: instruction formats, encoding of instructions, types; Execution unit: registers design, combinational shifters, ALU, division and multiplication algorithms; Control unit: register transfer language, hardwired and micro-programmed control unit; Memory unit: RAM, cache memory, associative memory, virtual memory; Input/output processors; Introduction to Assembly Language; Introduction multiprocessor systems and parallel processing.

IT 204 Web Programming

This course provides an introduction of web-development techniques that use HTML, CSS and JavaScript as a web development essentials including database connectivity (JDBC), Basics of PHP, Basics of Java for Web Development and Basics of Asp.Net as an advanced technique of web programming.

CS 219 Data Structure

The main objective of this course is to provide students with a basic of data structures. It is cover wide area of topic such as Array, Linked lists, Stacks, Queues, Recursion,

Graph and Tree structures. This course is also aims to provide students with an understanding of the basic searching and sorting algorithms, including, binary search and bubble sort, selection sort, and merge sort. The students will also provide with a conceptual understanding of the trade-offs among different abstract of data structures, hence enabling students to choose an optimal and appreciated data structure for a particular application.

CS 220 Introduction to Software Engineering

This course covers the fundamentals of software engineering, including understanding system requirements, finding appropriate engineering compromises, effective methods of design, coding, and testing, team software development, and the application of engineering tools. The course will combine a strong technical focus with a capstone project providing the opportunity to practice engineering knowledge, skills, and practices in a realistic development setting with a real client.

CS 205 Operating Systems

The course will start with a brief historical perspective of the evolution of operating systems over the last fifty years and then cover the major components of most operating systems. This discussion will cover the tradeoffs that can be made between performance and functionality during the design and implementation of an operating system. Particular emphasis will be given to three major OS subsystems: process management (processes, threads, CPU scheduling, synchronization, and deadlock), memory management (segmentation, paging, swapping), and file systems; and on operating system support for distributed systems.

ISLAM 103 Islamic Culture 3

الوقوف على مقاصد الشريعة الإسلامية والتي من أهمها المحافظة على الكليات الخمس، التعرف على خصائص ومميزات المنهج الاقتصادي الإسلامي، الوقوف على الأساليب الإسلامية في التنمية الاقتصادية، الوقوف على المشكلات الاقتصادية المتنوعة؛ ومعرفة الطرق المؤدية إلى علاجها، القدرة على التفرقة بين منهج الإسلام في الاقتصاد وبين الأنظمة الاقتصادية الوضعية ، معرفة الأحكام الشرعية المتعلقة بفقه المعاملات والنظام الاقتصادي في الإسلام، ولو على سبيل الإجمال، معرفة أهداف النظام الاقتصادي الاسلامي.

CS 208 Artificial Intelligence

This course is an introductory course to artificial intelligence. The purpose of this course is to provide an overview of this field. We will focus on problems in the field of AI and techniques and algorithms for solving those problems, therefore we will cover topics including: agents, search, planning, Uncertainty and learning. Students will not be expected to have any prior knowledge of AI, but they will be expected to have good programing skills and a grasp of basic theoretical techniques for analyzing computer algorithms.

ARAB 101 Arabic Language Skills

التعرف على طبيعة القراءة الصحيحة، التعرف على اهمية اللغة بوصفها وسيلة الاتصال الإنساني الأولى، تأليف الجملة الأساسية، إكساب الطالب مهارة البحث عن المفردات العربية، تمكين الطالب من كتابة الكلمات العربية صحيحة، استخدام محركات البحث، وقواعد المعلومات لجمع المعارف المتصلة بالمقرر، القدرة على ممارسة مهارات التواصل مع الآخرين، القدرة على العمل ضمن فريق جماعي لإنجاز مشروع بحثي، تنمية مهارة القدرة على قيادة فريق العمل، تنمية مهارات الطالب في استخدام علامات الترقيم والمعاجم العربية من خلال النصوص المختلفة والبحث في المعاجم وعقد المقارنة بين أنواعها.

CS353 Computer Graphics

This course is an amalgamation of the various basic concepts of Computer Graphics involving algorithms and practical sessions with Java (2D and 3D API's). A strong part for this course is the use of Blender (Open Source) to teach the concepts of graphics in details and making the students work on the system. Project design and conceptual ideas will be used in the system to enhance the capability of the course taker in graphical designing and animation effects. All programs depending on the topics can be created in C/Java and some additional Blender project must be taken in practical sessions.

CS301 Microprocessor & Assembly Language

In this course, we will cover topics such as Machine organization; assembly language: addressing, stacks, argument passing, arithmetic operations, decisions, modularization; Input/Output Operations and Interrupts; Memory Hierarchy and Cache memory; Pipeline Design Techniques; Super scalar architecture; Parallel Architectures.

IT305 Networks II

The course is the second in a series of courses on computer networking. It assumes familiarity with the basics of network architecture including the physical layer, the link layer, the network layer, and the transport layer. The course's topics include: an introduction the internet, the World Wide Web (WWW), and the Hypertext Transfer Protocol (HTTP), internet servers, high speed networks, optical networks, cellular networks, fixed infrastructure networks, multicast, intranet and internet routing protocols, comparison between distance vector and link state routing mechanisms, encryption, and resource reservation. Protocols for the above topics will be discussed along with their properties and ways to improve them the course's topics will be divided roughly into three sections: transport layer issues (inter-network routing, congestion control and avoidance).

IT410 Multimedia and Web Technologies

The goal of this course is to get students acquainted with the latest Multimedia and web application development Tools. The students will acquire advanced skills in web development along with the real hands on experience to build complex web applications. After having completed this course, students will have a thorough knowledge of all advanced web technologies. Topics include the Multimedia technologies, web development process, advanced layout and design features, advanced study of scripting languages, Adobe flash action scripting web application designing patterns, web services, Database concepts for web and the latest web development technologies introduced by Microsoft and Oracle.

IS322 Information Security

This course consists of Introduction to Information Security, Need for Security, Application Security, operating System Security, Web Security, Planning for Security, Security Technology: Firewalls, Intrusion Detection and Prevention Systems, Cryptography, Implementing Information Security, Student study the optimum protection strategies from harmful software from the internet and the protection techniques. Finally, complete Computer security for optimum security levels.

ARAB 103 Arabic Writing

توسيع ثقافة الطالب، ورفع قدراته التعبيرية، وزيادة ثروته اللغوية، ومساعدته على استخدام العبارة المناسبة بشكل دلالي واضح، تدريب الطالب على التحدث، وتنمية مهارة التفكير، وبناء الأفكار بمنطقية، وتنمية مهارة الحوار، وتداول الرأي، مع الحرص على التمسك باللغة العربية الفصحى ، رفع الأداء اللغوي لدى الطالب؛ بحيث يستطيع أداء عبارة سليمة من الأخطاء الإملائية والنحوية والصرفية والأسلوبية واللغوية ، تعليم الطالب أصول التحرير وأساسيات الكتابة بالعربية ، التعرف على أهمية اللغة بوصفها وسيلة الاتصال الإنساني الأولى، إكساب الطالب مهارة البحث عن المفردات العربية وكيفية كتابة المقالة والتفريق بين التلخيص والخلاصة ، استخدام محركات البحث، وقواعد المعلومات لجمع المعارف المتصلة   بالمقرر ، القدرة على ممارسة مهارات التواصل مع الآخرين.

CS410 Compilers

This module introduces topics include compiler design, lexical analysis, parsing, symbol tables, declaration and storage management, code generation, and optimization techniques. The aim of this module is to show how to apply the theory of language translation introduced in the prerequisite courses to build compilers and interpreters. It covers the building of translators both from scratch and using compiler generators. In the process, the module also identifies and explores the main issues of the design of translators. The construction of a compiler/interpreter for a small language is a necessary component of this module, so students can obtain the necessary skills.

CS411 Design and Analysis of Algorithms

This course introduces formal techniques to support the design and analysis of algorithms, focusing on both the underlying mathematical theory and practical considerations of efficiency. Topics include asymptotic complexity bounds, techniques of analysis, and algorithmic strategies such as Divide and Conquer, Greedy approach and etc.

CS412 Human-Computer Interaction

Human-computer interaction is an interdisciplinary field that integrates theories and methodologies from computer science, cognitive psychology, design, and many other areas. The course is intended to introduce the student to the basic concepts of human-computer interaction. It will cover the basic theory and methods that exist in the field. The course will unfold by examining design and evaluation. Case studies are used throughout the readings to exemplify the methods presented and to lend a context to the

issues discussed. The students will gain principles and skills for designing and evaluating interactive systems.

CS432 Selected Studies in Computer Sciences I

Mobile Application Development is a project oriented course which strongly emphasis on application development for the mobile operating systems. The theoretical part of the course covers all fundamental concepts of mobile development and the practical part teaches students how to build mobile's apps, for Android using Eclipse, Android Studio and for iPhones using X-code & iOS SDK. At the end of the course students are expected to complete a major project with the goal of releasing an app on mobile apps Market place.

CS488 Graduation Project1

The student proposes a project topic or idea according to his background of specialization with technical merit under supervision of academic members in the college. Towards the end of the semester, the GP should be well-defined by the student, submitting a report with the following sections: Background – Motivation of the project – Problem Statement- Scope of the Project – Computing Requirements and Expected Outcomes – Identified Tasks and a Tentative Work plan – Required Technical Tools. This early stage of GP is finally assessed by supervisors and GP committee members.

IS477 Training field

CS420 Modelling and Simulation

This subject provides students with 1. The basic system concept and definitions of system. 2. Techniques to model and to simulate various systems. 3. The ability to analyze a system and to make use of the information to improve the performance.

CS421 Cryptography

This course is an introduction to the basic theory and practice of cryptographic techniques used in computer security. We will cover topics such as encryption (secret-

key and public-key), message integrity, digital signatures, user authentication, key management, cryptographic hashing, Network security protocols (SSL, IPsec), public-key infrastructure, digital rights management, and a bit of zero-knowledge protocols.

CS 42 Computer Ethics

This course is an introduction to the content for a Computer Ethics Undergraduate Course to be taught at the Computer Science department. The course concentrates on theory and practice of computer ethics. The aim of the course is to study the basis for ethical decision making and the methodology for teaching ethical decisions concerning computing matters.

CS499 Graduation Project 2

Graduation project (2) will allow the students to use their acquired knowledge throughout the program to implement the design that proposed in graduation project (1). It will also assist students to perform testing, to apply appropriate error detection and corrections techniques, and help students to evaluate their system/software. Students will be able to work individually as well as in a team, students will be guided to maintain ethical issues, documentation formats, develop presentation and communication skills, use of references and checking plagiarism. Finally students will produce a runnable software/developed system in real time along with the final version of project report.

CS443 Selected Studies in Computer Sciences II

This course is the continuation of previous course ―Introduction to Mobile Application Development‖. The goal of this course is to provide a rich experience to the students for developing several types of mobiles Apps. These advanced topics give a much deeper understanding of the internals of mobile apps and explains more complex features of development. Topics include Background Services, Security Services, Internet Services, Location Based Services, Cloud Integration, Social Framework, Debugging & Testing, Using Bluetooth, Gaming, and Wireless Networking for Mobile Apps, and the latest frameworks to create advanced apps.