**Computer Information Systems Course Description**

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| **Course Name** | **Calculus-1** |
| **Course No.**  | **0301101** |
| This course illustrates functions, domain, operations on functions, graphs of functions, trigonometric functions, limits, meaning of limit, computational techniques, limits at infinity, infinite limits, continuity, limits and continuity of trigonometric functions, the derivative, techniques of differentiation, derivatives of trigonometric function, the mean value theorem, inverse functions, logarithmic and exponential functions, etc. |
| **Course Name** | **Principles of Statistics and Probability** |
| **Course No.**  | **0301131** |
| This course describes statistical data by tables, graphs and numerical measures, counting methods, combinations, permutations, elements of probability and random values, the binomial, the distributions sampling distributions, elements of testing hypotheses, statistical inferences about one and two populations parameters. |
| **Course Name** | **Discrete Mathematics** |
| **Course No.**  | **2222111** |
| The purpose of this course is to acquaint the student with several discrete mathematical structures and theories that bear relevance to Computer Science. These include sets, relations, functions, matrices, and graphs, groups, counting techniques, mathematical logic and Boolean algebra. This course provides a mathematical foundation for subsequent study in Computer Science, as well as developing the skills necessary to solve practical problems. |
| **Course Name** | **Introduction to Programming** |
| **Course No.**  | **2211211** |
| This course presents the fundamental concepts of programming using C++. It covers basic structures of programming tools such as variable names, data types, control structures, arrays, functions and pointers. An Introduction to classes and objects is also given. Practical work for three hours weekly is also included. |
| **Course Name** | **Object Oriented Programming** |
| **Course No.**  | **2211123** |
| The course will cover the following topics: Object-Oriented Programming (OOP) Environment; Input/Output; Loops; Decision; Methods; Arrays and Strings; Encapsulation; Object Oriented Programming; Useful OO features; Classes and objects; inheritance; Polymorphism; Applet  |
| **Course Name** | **Data Structure** |
| **Course No.**  | **2211211** |
| Presents fundamental techniques in the design and analysis of data structures that lie at the heart of computer science (e.g. data structures include: lists, stacks, queues, trees, priority queues, hashing, graphs, and search trees). Introduces algorithm design and analysis techniques such as recursion and formal methods for analyzing the time and space requirements of programs. Provide programming assignments that require students to apply the concepts introduced in classes in the development of rather large programs. Demonstrate awareness of current areas of research by locating and summarizing examples of recent progress. |
| **Course Name** | **Introduction to Database** |
| **Course No.**  | **2211261** |
| The course objectives are to provide students with an overview of database management system architecture and environment, an understanding of the basic database design and implementation techniques, and a practical experience of designing and building a relational database. Other objectives of this course are to make the student able to discuss and explain the importance of the data, the difference between file management and database. Furthermore, it enables applying conceptual design methodologies for databases and learning about the architecture and environments of the database management system (the Ansi-Sparc model). It also enables the student to design and evaluate suitable security and integrity levels for database schemas. This course requires a practical training which is assessed by producing small individual and group projects. |
| **Course Name** | **Introduction to Information Technology** |
| **Course No.**  | **2221111** |
| This course introduces the concepts of information technology (IT) and Information System (IS) regarding the business environment. It covers IT infrastructure: hardware, software, telecommunication, and network. Also covers IT applications including data, knowledge, decision support, Enterprise Systems, in business and e-commerce. Finally, it describes the software development and looks at software ethics, impacts and security |
| **Course Name** | **Computer Ethics and Communication Skills** |
| **Course No.**  | **2231101** |
| This course introduces students to documentation and scholarly writing. Topics include Various types of technical reports and documents such as articles, proposals, user guides, project reports, etc. through ethical and professional citation methods. Quote and plagiarism. Workplace Computing Ethics, Computer Misuse, Privacy, Confidentiality. Various Ethics and Guidelines for Professional Computing Users (ACM, IEEE, etc.) |
| **Course Name** | **Digital Logic Design** |
| **Course No.**  | **0405131** |
| This course concern of numbering systems, designing combinational and sequential digital logic circuits, Boolean algebra, simplification using Karnaugh maps, blocks (Decoder, Encoder, Multiplexors, and DeMux, Adders, Subtratctor, Multiplication and arithmetic logic circuits. |
| **Course Name** | **Fundamental of Computer Architecture for IT Students** |
| **Course No.**  | **0405231** |
| This course is intended as a second course in hardware for the students majoring in computer science. It covers components used in the design of digital computers and data representation, Design of digital computer subsystems, Flow of information and logical flow diagrams in timing and control signals, memory subsystems; I/O organization, the control unit of a digital computer, introduction to microprogramming and pipeline |
| **Course Name** | **Introduction to Programming Lab** |
| **Course No.**  | **2211122** |
| Object-oriented programming (OOP) is a programming paradigm that uses "objects" and their interactions to design applications and computer programs. This course is an introductory course to the Object-Oriented Design. It is based on several techniques, including Encapsulation, inheritance, polymorphism. The topics covered include objects and classes, constructors and destructors, operator overloading, virtual and inline functions, friend functions, this pointer, pointers and references to objects, templates and exception handling. |
| **Course Name** | **Object Oriented Programming Lab** |
| **Course No.**  | **2211122** |
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| **Course Name** | **Algorithms** |
| **Course No.**  | **2211212** |
| This course presents fundamental techniques for designing and analyzing computer algorithms. Students learn how to write efficient algorithms to solve various problems and how to estimate their running times before running them. The course covers general problem-solving techniques including divide-and-conquer, greedy, dynamic programming, and brute-force, branch-and-bound and backtracking. These techniques are applied to set of problems such as sorting, knapsack, graph problems, etc. The course also gives an introduction to the theory of NP-Completeness. |
| **Course Name** | **Algorithms Lab** |
| **Course No.**  | **2211214** |
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| **Course Name** | **Introduction to Database Lab** |
| **Course No.**  | **2211262** |
| Design and architecture of database systems, query formulation, data models, data structures to minimize access time, hierarchical, network, and relational data structures and database management system in microcomputers are the cornerstone of this course. Practical work for three hours weekly is also included. |
| **Course Name** | **Database Programming** |
| **Course No.**  | **2211263** |
| This course covers the design and architecture of database systems, query formulation, data models, data structures to minimize access time, hierarchical, network, and relational data structures and database management system in microcomputers are the cornerstone of this course. |
| **Course Name** | **Computer Network** |
| **Course No.**  | **2211351** |
| This course covers fundamental computer networking concepts and principles. It first introduces the OSI and TCP/IP network architecture models. It then studies the implementation principles and design issues at each layer of these models. It also deals with the major issues in the bottom three (Physical, Data Link and Network) layers of the OSI reference model. |
| **Course Name** | **Computer and Network Security** |
| **Course No.**  | **2212351** |
| This course describes a wide range of security concepts and terminologies. It starts by describing OSI security architecture, security services, type attacks, and mechanisms. Following, the course is divided into two parts: cryptography including (symmetric cipher, asymmetric cipher and hash functions) and network security attacks and solutions. Topics covered in cryptography include classical symmetric cipher methods including substitution and transposition techniques, block cipher methods (Data Encryption Standard (DES), Advanced Encryption Standard (AES)), Pseudorandom Number Generation and stream cipher. In asymmetric cipher Public-Key Cryptography and RSA are explained. The last part of this course provides details of recent network layer security attacks and solutions. |
| **Course Name** | **Computer and Network Security Lab** |
| **Course No.**  | **2212353** |
| This course provides a practical explanation and application in the laboratory of a set of experiments to provide the student with practical experience: router to switch and configure and configure VLANs, network design, implementation and construction and exploration of routing tables. The student designs a network using Packet Tracer Simulator. In addition to the course, the course provides practical explanation and application of network and wireless security, installing wireless adapters, building ad hoc wireless networks, configuring access points, configuring wireless bridges, basic wireless network security and advanced router. The student also tracks and evaluates the performance and efficiency of the network. Students will be required to solve practical programming tasks in each topic. |
| **Course Name** | **Computer Graphics** |
| **Course No.**  | **2211361** |
| This course includes an overview of Computer Graphics applications; Graphics Output Primitives and its attributes; 2D and 3D Geometric Transformations; 2D Viewing and Clipping; Graphical User Interface and its attributes; Introduction to OpenGL programming and its applications; Example applications will be developed in lectures using C++ and OpenGL to demonstrate the techniques being presented |
| **Course Name** | **Internet Programming** |
| **Course No.**  | **2221223** |
| In this course, the students will learn everything they need to know to start building websites from the ground up. All web content will be hand coded using a simple text editor with a strong emphasis on well-formed valid code. they will learn the three main standards covered in the course are HTML tags, Java Script and Easy PHP, able to design web pages that provide design editor; Using the programming language to create dynamic pages, web pages and associating it with the database in publishing the websites they create on the Internet to gain knowledge and skills in.The goal is to prepare students with skills for designing, creating, programming, publishing, and developing applications on the Web. Practical work for three hours weekly is also included.  |
| **Course Name** | **Visual Programming** |
| **Course No.**  | **2221321** |
| This course acquaints students with the design, development, testing and documentation of Visual BASIC .NET programming language. Visual BASIC’s object oriented event driven (OOED) interface is used to program sequential, conditional, and repetition structures. Multiple objects and control arrays are used to gather input. Sequential data files are created and accessed in Visual BASIC.NET programs. Visual Studio environment: Controls, components, wizard; Language constructs and structures: Variables, assignment, arithmetic, selection, repetition, arrays, functions; Advanced controls: Frames, Labels, Boxes and others; Strings: Operations and formatting. Graphics: Coordinate systems and drawing methods; Database (DML, quires, projects ,sqlserver |
| **Course Name** | **Introduction to Artificial Intelligence** |
| **Course No.**  | **2222261** |
| This is an introductory Undergraduate AI course. During the semester we will cover Data Science and AI introduction, general knowledge representation techniques and problem-solving strategies. Topics will include search, intelligent agents, game playing, rule-based systems, logic programming, frames (and semantic networks. Finally, Fuzzy Logic and control will be covered as well. |
| **Course Name** | **Artificial Intelligence Lab** |
| **Course No.**  | **2222362** |
| This course provides a practical explanation and application in the laboratory on gaining broad experience in basic concepts in artificial intelligence. An introduction to the basic principles, techniques, and applications of artificial intelligence. Coverage includes knowledge representation, reasoning, inference, problem solving, research algorithms, game theory, perception, learning, planning, and agent design. Students will test programming in AI language tools. Potential areas for further exploration include expert systems, neural networks, fuzzy logic, robotics, natural language processing, and computer vision. Students will be required to solve practical programming tasks in each topic. |
| **Course Name** | **Operating System** |
| **Course No.**  | **2211431** |
| An introduction to computer operating systems, evaluation of operating systems services, process management, process state, cooperating processes, process synchronization and threads are dealt with. Operating system structure, the layered approach, the virtual machine concept, processor scheduling, context switching, semaphores are also covered. System management, memory management, process loading, resource allocation and deadlock, communication with peripherals, file systems, interactive computation. Practical work for two hours weekly is also included. |
| **Course Name** | **Distributed Database** |
| **Course No.**  | **2221363** |
| This course covers the principles of distributed databases and how they differ from centralized databases. It focuses on understanding the concepts of designing and managing distributed databases. Furthermore, the course introduces the problems of distributed data management, especially in the case of heterogeneous databases. The course will cover the most broadly adopted systems and techniques in the field of data integration for distributed environments, such as data warehousing, Big data management and NoSQL alternatives. Case studies in the field of healthcare information systems and e-commerce information systems are given as examples for data integration issues. The course will provide a cohesive overview regarding the importance of data management and data analytics in the era we are living. |
| **Course Name** | **Management Information System** |
| **Course No.**  | **2202242** |
| This course introduces students to the use of Information System (IS) and management information systems (MIS) within today’s fast-paced, dynamic, and global business environment. In addition, enable students to gain knowledge and skills on how the information technology and information management system can support organizations to complete effectively in a fast-paced dynamic business environment. |
| **Course Name** | **System Analysis and Design** |
| **Course No.**  | **2221241** |
| This course includes the following: 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 in Clinical Information Systems. |
| **Course Name** | **Software Project Management** |
| **Course No.**  | **2221362** |
| This course aims to introduce students to the concepts of Project Management for Information Systems. It provides students with the required skills to identify and select projects, planning, performing, and controlling the project. It gives students an understanding of the different possibilities in developing the schedule, resource utilization, determining costs, managing risk and closing a project. The course Introduces students to Project Management responsibilities and skills needed. The topics that are covered each week are demonstrated using the case study to show how the project management process activities are deployed in. |
| **Course Name** | **Human Computer Interaction** |
| **Course No.**  | **2221371** |
| This course includes the following: introduction to Human Computer Interaction; design, implementation, and evaluation of interactive computing system for human use; Ergonomics; Components of an interactive system; Human; Computer; Interaction Design; Interaction Design Activities; Data gathering; Prototyping; Evaluation paradigms and techniques; Agents and natural language processing. The course gives students an understanding of interaction design process, the content of the course enables the students to deploy interaction design principles into health-related application (healthcare and patient management), students are required to show the interaction design activities, prototyping, Evaluation paradigms and techniques, and Universal design principles in the project. |
| **Course Name** | **Database Management System** |
| **Course No.**  | **2221441** |
| This course covers the following topics: the technical approach to database design: Database Models (Hierarchical, Network, Object-Oriented, and Relational), Database Modeling (Entities and Relationships, Normalization), Database Manipulation (SQL), The application of database technology to the business environment (through many business-related examples, particularly in Marketing), The management issues raised by deployment of database technology (Security, Concurrency, Back-up and Recovery), Emerging database technology (Data Warehousing and Data Mining with business examples).  |
| **Course Name** | **Database Warehouse** |
| **Course No.**  | **2221442** |
| This course covers basic topics related to data warehousing. These include building the data warehouse team, developing the business model, tools for data warehouse creation, maintenance, and delivery. The course focuses on fundamentals of object analysis for business model creation and using the business model as a foundation for multi-dimensional analysis. The students will learn about the importance of metadata as well as schema designs and its variants. Also, data sources for the warehouse (such as legacy systems, operational systems, and others), multi-level architecture for integrating heterogeneous data and understanding and managing summary data. Finally, students will learn strategies for data validation and production issues for warehouse delivery. |
| **Course Name** | **Information System Retrieval** |
| **Course No.**  | **2221461** |
| This course on information storage and retrieval focuses on the theory and concepts of information retrieval system, introduces the basic principles of information storage, processing, and retrieval in terms of the information retrieval system analysis and design. The topics in this course include query structure and its characteristics, the representation of documents and other objects within an information system, internal matching mechanisms, document analysis, user’s perspective, retrieval effectiveness measure, alternative retrieval techniques, output presentation, data file structures, visualization for information, the Internet search engine, and discussion of current research trends in the field. The aim of this course is to prepare students as information retrieval system analysts and designers. |
| **Course Name** | **Fundamental of Software Engineering** |
| **Course No.**  | **2231261** |
| This course provides a general introduction to software engineering. It introduces concepts such as software processes and agile methods, and essential software development activities, from initial specification through to system maintenance. Project management and professional software engineering practice will also be covered. The course introduces the following concepts: software engineering, software process, software process models; software life cycle; software project management; requirements and specification (types of requirements, requirement engineering, requirement analysis, prototyping, formal and algebraic specification); software design and modeling; reliability; maintenance; portability; documentation, re-engineering and reverse engineering. The main goal of this course is to equip students with knowledge about software engineering concepts and software development process models, as well as the skills required to collect system requirements and design system models. |
| **Course Name** | **Practical Training** |
| **Course No.**  | **2221381** |
| The student must be trained in an institution (public or private sector) for eight continuous weeks inside Jordan or outside it, with (40) working hours per week The training will be under the supervision of the faculty member. Its purpose is to collect students' knowledge and experiences and skills offered during the academic part of the program in a practical environment. The student must provide a report from the institution that shows the efficiency of the training. accreditation of the training venue requires approval section. Students are allowed to register for the field training course after completing the study of no less than (90) hours. A student may not combine training and study of theoretical subjects during any of the first and second semesters, except in special cases it is decided by the College Board, with no more than (3) credit hours if that leads to his graduation and is not permitted for the student in the summer semester only to register field training only.  |
| **Course Name** | **Graduation Project-1** |
| **Course No.**  | **2221491** |
| In this course students must present the first phase of their capstone project which includes the project proposal, analysis, and project design process. A report must be submitted at the end of each stage to the management and supervisor |
| **Course Name** | **Graduation Project-2** |
| **Course No.**  | **2221492** |
| This course includes developing an application system for the proposal that was presented in the subject of Project-1 in the field of computer equipment and computer confrontation with external equipment or in scientific fields such as simulation, computer graphics, artificial intelligence, or others. The student uses the programming languages ​​that he learned during his studies or other suitable languages. At the end of the semester, the student or project team makes a presentation of the project during a discussion session in front of a committee of department council members in addition to the project supervisor. |
| **Course Name** | **Numerical Analysis-1** |
| **Course No.**  | **0301323** |
| The course is basic course in numerical methods. It introduces students to: Error analysis; Finding roots of a function: bracketing and iterative methods; Roots: direct and indirect solution of systems of linear equations; Solution of nonlinear systems; Approximation and interpolation; Numerical integration and differentiation. |
| **Course Name** | **Digital Logic Design** |
| **Course No.**  | **0405131** |
| This course concern of numbering systems, designing combinational and sequential digital logic circuits, Boolean algebra, simplification using Karnaugh maps, blocks (Decoder, Encoder, Multiplexors, and DeMux, Adders, Subtratctor, Multiplication and arithmetic logic circuits. |
| **Course Name** | **Fundamental of Computer Architecture IT Students** |
| **Course No.**  | **0405231** |
| This course is intended as a second course in hardware for the students majoring in computer science. It covers: components used in the design of digital computers and data representation, Design of digital computer subsystems, Flow of information and logical flow diagrams in timing and control signals, memory subsystems; I/O organization, the control unit of a digital computer, introduction to microprogramming and pipeline |
| **Course Name** | **Programming Using Java** |
| **Course No.**  | **2221221** |
| This course enables students without a background in software development to become proficient programmers who are prepared for a follow-on course in data structures. The Java language will be used to introduce foundations of structured, procedural, and object-oriented programming. Topics include input/output, data types, operators, program control flow structures, arrays, strings, and methods. Students will also be introduced to classes, objects, inheritance, polymorphism, exception handling, processing streams and files, collections, wrappers, and generics, and graphical user interfaces. Students will complete several programming assignments and projects to develop their problem-solving skills and to gain experience in detecting and correcting software errors. |
| **Course Name** | **Programming using Java Lab** |
| **Course No.**  | **2221222** |
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| **Course Name** | **Multimedia Programming** |
| **Course No.**  | **2221322** |
| This course is mainly designed to introduce the theoretical concepts of digital media including images, audio, animation, and video. The difference between analog and digital media is discussed. Different types of digital media are outlined, and their digital storage process is explained in detail. In addition, different types of digital media compression techniques are introduced. The most popular file formats are outlined for each media type. Finally, the Multimedia related hardware, software, and web-related issues are discussed where necessary. |
| **Course Name** | **Advanced Internet Programming** |
| **Course No.**  | **2221323** |
| Web programming is the practice of writing applications that run on a web server and can be used by many different people. Web programming allows you to turn a simple, static HTML page into a dynamic masterpiece. It allows others to interact with your web site and use the application on any computer with Internet access. It is often easier than programming applications that will run directly on the computer. It allows you to make or edit anything dynamic on your website, such as a forum, a guestbook, or even a form submission. This course will help you understand, what web programming is and why you might want to do it. It is part of the five courses related to Web Application Development. |
| **Course Name** | **Computer Animation** |
| **Course No.**  | **2221324** |
| This course develops theoretical and practical training on the basics of drawing in addition to animating objects and characters digitally. Animation is commonly used for illustration, animation, architecture, and engineering. This course also gives knowledge for students to animate objects, cameras, and characters in the 3D world to make the animation performance believable and ready for games or movies.  |
| **Course Name** | **Geographic Information System** |
| **Course No.**  | **2221342** |
| This course provides an introduction about Geographical Information Systems (GIS) and information age; Geographic data in the computer; What does GIS do: Spatial data; Raster and Vector Data; Topology and spatial relationships; Data entry and data acquisition.Database and inventory operations; Basic analysis (overall map algebra); Advanced analysis (proximity and terrain analysis); Site suitability and models; Data issues and problems; GIS software systems; Applications. |
| **Course Name** | **Network Management** |
| **Course No.**  | **2221351** |
| This course introduces the network management protocols that specify the monitoring, configuring, and controlling of network devices. Topics include introduction to network management and the functions of network management, data modeling languages for the definition of data sent over network management protocols (e.g., SMI and YANG), the organization and operation of network management protocols (e.g., SNMP, RESTCONF, and NETCONF), and encoding of the actual data inside the messages of the network management protocols.  |
| **Course Name** | **Natural Language Processing** |
| **Course No.**  | **2222243** |
| This course introduces various methods to represent human languages as computational systems. Methods of exploiting these representations are also investigated in order to write programs utilizing text and speech data, such as translation, summarization, extracting information, question answering, natural interfaces to databases, and conversational agents. This course includes some ideas central to Machine Learning (discrete classification, probability models) and to Linguistics (morphology, syntax, semantics). Also covers computational treatments of words, sounds, sentences, meanings, and conversations.  |
| **Course Name** | **Machine Learning** |
| **Course No.**  | **2221411** |
| This course provides a broad introduction to machine learning, data mining, and statistical pattern recognition. Topics include: (i) Supervised learning (parametric/non-parametric algorithms, support vector machines, kernels, neural networks). (ii) Unsupervised learning (clustering, dimensionality reduction, recommender systems, deep learning). (iii) Best practices in machine learning (bias/variance theory; innovation process in machine learning and AI). The course will also draw from numerous case studies and applications, so that you'll also learn how to apply learning algorithms to building smart robots (perception, control), text understanding (web search, anti-spam), computer vision, medical informatics, audio, database mining, and other areas. In addition to design and create data visualizations based on data available and tasks to be achieved. Students will learn to evaluate the effectiveness of visualization designs, and think critically about each design decision, such as choice of color and choice of visual encoding |
| **Course Name** | **Computer Vision** |
| **Course No.**  | **2221412** |
| This course introduces computer vision, including fundamentals of image formation, camera imaging geometry, feature detection and matching, stereo, motion estimation and tracking, image classification, scene understanding, and deep learning with neural networks. Develop basic methods for applications that include finding known models in images, depth recovery from stereo, camera calibration, image stabilization, automated alignment, tracking, boundary detection, and recognition. Develop the intuitions and mathematics of the methods and learn about the difference between theory and practice in projects using different programming languages. |
| **Course Name** | **Data Mining** |
| **Course No.**  | **2222441** |
| This course provides the students with an introduction to data mining, that is knowledge discovery from data (KDD). This course explores the concepts and techniques of knowledge discovery and data mining. The course will focus on issues relating to the feasibility, usefulness, effectiveness, and scalability of techniques for the discovery of patterns hidden in large data sets. The students will learn the basic concepts of data pre-processing, frequent pattern mining, classification, and clustering​ |
| **Course Name** | **Game Design and Programming** |
| **Course No.**  | **2221463** |
| This course aims at teaching students the core software component of a computer video game and interactive application with real-time graphics. This course aims to teach the student the fundamental techniques and algorithms that drive most computer and video games, students will learn the theory and study the implementation details of Game architecture, Design patterns, AI Techniques, Scripting, network programming and Engine Programming.  |
| **Course Name** | **Parallel and Distributed Systems** |
| **Course No.**  | **2221462** |
| This course introduces the students to parallel and distributed systems. It includes concepts and principles of parallel and distributed systems, models of parallel and distributed systems, design and performance issues of parallel and distributed systems, communication and synchronization operations, performance and scalability of parallel systems, parallel computers architectures, and recent trends in parallel/distributed computing together with their impact on individuals and societies. |
| **Course Name** | **Special Topics in CIS** |
| **Course No.**  | **2221493** |
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