Form: Study Plan- Bachelors		
	Form Number	EXC-01-03-02A
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	Number of Pages	08

1.	School	**King Abdullah II School for Information Technology**
2.	Department	**Computer Information Systems**
3.	Program title (Arabic)	**أنظمة المعلومات الحاسوبية**
4.	Program title (English)	**Computer Information Systems**

5. Components of Curriculum:

The curriculum for the bachelor's degree in **Computer Information Systems** consists of **(132)** credit hours distributed as follows:

Number	**Type of requirement**	**credit hours**
First	University Requirements - Compulsory Requirements	**18**
Second	University Requirements - Electives	**9**
Third	Faculty Requirements	**24**
Fourth	Specialization Requirements	**81**
Total		**132**

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6. Numbering System:

A- Department number

Department	Number
Computer Science (CS)	1
Computer Information Systems (CIS)	2
Business Information Systems (BIS)	3
Information Technology (IT)	4
Artificial Intelligence (AI)	5

B- Course number

Domain title	Domain number	Domain title	Domain number
General	0	Applications	5
Programming Languages	1	Distributed Systems and Communications	6
Information Systems and Management	2	Systems Development	7
Hardware Components and Basic Constructs	3	Specialized Topics	8
Computational Sciences and Algorithms	4	Special Topics and Project	9

C- Course number consists of 7 digits

School		Department		Level	Serial number	
1	9	0	2	X	X	X

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First: Obligatory University Requirements

Compulsory Requirements (18 Credit Hours)					
No.	**Course Title**	**Course No.**	**Credit Hours**	**Prerequisites**	**Notes**
1	MILITARY SCIENCES	2220100	3		
2		3202003	3	3202002	
3	NATIONAL CULTURE	3400100	3		
4		3420100	3		
5		3420101	3		
6		3420102	3		

Preparation Program Requirements

All students admitted to the university must apply for a degree examination in Arabic and English and the computer is prepared or approved by the university to determine their level. Based on the results of the examinations, either the student will study one or more of the requirements of the preparatory program

(15 Credit Hours)

No.	**Course Title**	**Course No.**	**Credit Hours**	**Prerequisites**	**Notes**
1	Community Service	0300150			
2	Computer Skills Placement Test	1902098			
3	Basics Of Computing	1932099	3	1902098	
		3201001	3		
		3202002	3	3201001	
	English Language(Level1)	3202001	3		
		3202002	3	3202001	
4	Arabic Placement Test	3211098			

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5	English Placement Test	3212098			

Elective University Requirements

(9 Credit Hours)

Elective courses: (9) credit hours to be chosen from the first, second and third groups mentioned below. The student has to choose one course from each of the groups.

(First Group)

No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Environmental Culture And Development	0310102	3		
2	Islamic Culture	0400102	3		
3	Health Culture	0720100	3		
4	Legal Culture	1000102	3		
5	Physical Fitness Culture	1100100	3		
6		2603100	3		
7	Introduction To Philosofy And Critical Thinking	3400103	3	1932099,3410100	

(Second Group)

No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1	Islam And Contemporary Issues	0400101	3		
2	Social Media	1900101	3		
3	Appreciation Of Arts	2000100	3		
4	Foreign Language	2200103	3		
5	Arab-Islamic Civilization	2300101	3		
6	Jordan: History And Civilization	2300102	3		
7	Special Subject	3400106	3		

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8	Great Books	3400107	3		
9	Jerusalem	3400108	3		
(Third Group)					
No.	Course Title	Course No.	Credit Hours	Prerequisites	Notes
1		1900104	3	1941102	

Second: School courses: distributed as follows:

A. Obligatory school courses: (**24**) credit hours

B. Elective school courses: (**0**) credit hours

A. Obligatory school courses: (**24**) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
1901101	Discrete Mathematics	3	-	3	-
1941102	Introduction to Programming	3	-	3	Pass Qualification Exam or 1932099
1904101	Fundamentals of Information Technology	3	-	3	-
1904120	Web Applications Development	3	-	3	1941102
1902110	Object Oriented Programming	3	-	3	1941102
1901242	Data Structures	3	-	3	1902110
1902224	Database Management Systems	3	-	3	1902110
1915101	Linear Algebra for Computational Sciences	3	-	3	0301101
1902390	Seminar-Road to Software Industry	2	-	0	Pass 45 Hours

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B. Elective school courses: (0) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		

Third: Specialty courses: (81) credit hours distributed as follows:

B. Obligatory specialty courses: (72) credit hours
C. Elective specialty courses: (9) credit hours

A. Obligatory specialty courses: (72) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
0301101	Calculus-1	3	-	3	-
0301131	Principles of Statistics	3	-	3	-
1902203	Computing Ethics and Documentation	3	-	3	1904101
1902214	Advanced Java Programming	3	-	3	1902110
1902225	Information Systems and Applications	3	-	3	1904101
1902226	Health Information Management	3	-	3	1902224 and 1902225
1901341	Theory of Algorithms	3	-	3	1901242
1902325	Health Informatics	3	-	3	1902226 and 0301131
1902384	Health Information Security and Privacy	3	-	3	1902226 and 1901363
1903320	Artificial Intelligence	3	-	3	1901242

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1902353	Human Computer Interaction	3	-	3	1904120
1902372	Software Engineering	3	-	3	1902224
1902328	Healthcare Database Administration	3	-	3	1902226 and 1902224
1902310	Mobile Development Frameworks	3	-	3	1904120 and 1902214
1901363	Computer Networks	3	-	3	1901242
1902329	Emerging Trends and Technologies in Health Informatics	3	-	3	1902226
1902459	Geographical Information Systems	3	-	3	1902214 and 1902225
1902454	Digital Image Processing	3	-	3	1902214
1902472	Advanced Software Engineering	3	-	3	1902372
1902478	Project Management	3	-	3	1902372
1902474	Systems Analysis and Design	3	-	3	1902372
1901473	Operating Systems	3	-	3	1901242
1902490	Employment Readiness 1 (Project-Based)	-	-	0	Pass 90 Hours
1902491	Employment Readiness 2 (Project-Based)	-	-	3	1902490
1902492	Employment Readiness 3 (Skills-Based)	-	-	3	1902490
1902493	Internship and Professional Certification	6 Weeks		0	1902490

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B. Elective specialty courses: (9) credit hours:

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
1902351	Multimedia	3	-	3	1901242 and 1915101
1902355	Computer Assisted Learning	3	-	3	1904120
1901359	Computer Graphics	3	-	3	1901242
1902369	Healthcare Cloud Computing	3	-	3	1902226 and 1901363
1905222	Data Mining	3	-	3	1902224 and 1915101
1905310	Advanced AI Programming	3	-	3	1902214
1905380	Natural Language Processing	3	-	3	1905320
1915370	Machine Learning and Neural Networks	3	-	3	1905222
1902458	Certified Software	3	-	3	1902214
1904253	Web Server Programming	3	-	3	1904120
1902383	Information Technology Entrepreneurship and Innovation	3	-	3	1902224
1902324	Database Technologies and Applications	3	-	3	1902224
1902380	User Interface/Experience Design	3	-	3	1902353
1902381	Business Process Re-engineering	3	-	3	1902225
1902326	Information and Knowledge Management	3	-	3	1902225
1914351	Security of Web Applications	3	-	3	1902224 and 1904120

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1902327	Intelligent Information Systems	3	-	3	1902225 and 1905320
1902382	Development and Operations (DevOps)	3	-	3	1902372
1902479	Information Systems Audit and Quality Assurance	3	-	3	1902372 and 0301131
1902494	Special Topics	3	-	3	1902225
1902481	Game Development	3	-	3	1902214
1905453	Virtual Reality	3	-	3	1902454
1905430	Internet of things IoT	3	-	3	1905320 and 1901363
1904487	e-Payment Systems	3	-	3	1902384
1905382	Digital Speech Processing	3	-	3	1905320

Fourth: Courses offered by other faculties/schools and departments (**Math, Computer Science, Information Technology, Artificial Intelligence**)

Course Number	Course Title	Contact Hours		Credit Hours	Pre-requisite
		Theoretical	Practical		
1901101	Discrete Mathematics	3	-	3	-
1941102	Introduction to Programming	3	-	3	Pass Qualification Exam or 1932099
1904101	Fundamentals of Information Technology	3	-	3	-
1904120	Web Applications Development	3	-	3	1941102
1901242	Data Structures	3	-	3	1902110
1915101	Linear Algebra for Computational Sciences	3	-	3	0301101
0301101	Calculus-1	3	-	3	-
0301231	Principles of Statistics	3	-	3	-

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1901341	Theory of Algorithms	3	-	3	1901242
1901359	Computer Graphics	3	-	3	1901242
1905320	Artificial Intelligence	3	-	3	1901242
1901363	Computer Networks	3	-	3	1901242
1901473	Operating Systems	3	-	3	1901242
1905222	Data Mining	3	-	3	1902224 and 1915101
1905310	Advanced AI Programming	3	-	3	1902214
1905380	Natural Language Processing	3	-	3	1905320
1915370	Machine Learning and Neural Networks	3	-	3	1905222
1904253	Web Server Programming	3	-	3	1904120
1911351	Security of Web Applications	3	-	3	1902224 and 1904120
1905453	Virtual Reality	3	-	3	1902454
1905430	Internet of things IoT	3	-	3	1905320 and 1901363
1904487	e-Payment Systems	3	-	3	1902384
1905382	Digital Speech Processing	3	-	3	1905320

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Fifth: Advisory Study Plan

Year (1)

(First) Semester			(Second) Semester		
Course Number	**Course Title**	**Credit Hours**	**Course Number**	**Course Title**	**Credit Hours**
0301101	Calculus -1	3	1904120	Web Application Development	3
1901101	Discrete Mathematics	3	1902110	Object Oriented Programming	3
1901102	Introduction to Programming	3	1915101	Linear Algebra for Computational Sciences	3
1904101	Fundamentals of Information Technology	3	0301131	Principles of Statistics	3
	University Requirement	3		University Requirement	3
	University Requirement	3		University Requirement	3
Total		**18**	**Total**		**18**

Year (2)

(First) Semester			(Second) Semester		
Course Number	**Course Title**	**Credit Hours**	**Course Number**	**Course Title**	**Credit Hours**
1901242	Data Structures	3	1902214	Advanced Java Programming	3
1902224	Database Management Systems	3	1902226	Health Information Management	3
1902225	Information Systems and Applications	3	1901341	Theory of Algorithms	3
1902203	Computing Ethics and Documentation	3	1901363	Computer Networks	3
	University Requirement	3		University Requirement	3
	University Requirement	3		University Requirement	3
Total		**18**	**Total**		**18**

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Year (3)

(First) Semester			(Second) Semester		
Course Number	**Course Title**	**Credit Hours**	**Course Number**	**Course Title**	**Credit Hours**
1902310	Mobile Development Frameworks	3	1905320	Artificial Intelligence	3
1902325	Health Informatics	3	1902328	Healthcare Database Administration	3
1902353	Human Computer Interaction	3	1902384	Health Information Security and Privacy	3
1902372	Software Engineering	3	1902329	Emerging Trends and Technologies in Health Informatics	3
1901473	Operating Systems	3		Elective Specialization Requirement	3
1902390	Seminar-Road to Software Industry	0		Elective Specialization Requirement	3
Total		**15**	**Total**		**18**

Year (4)

(First) Semester			(Second) Semester		
Course Number	**Course Title**	**Credit Hours**	**Course Number**	**Course Title**	**Credit Hours**
1902454	Digital Image Processing	3	1902491	Employment Readiness 2 (Project-based)	3
1902472	Advanced Software Engineering	3	1902492	Employment Readiness 3 (Skills-based)	3
1902474	Systems Analysis and Design	3	1902493	Internship and Professional Certification	0
1902490	Employment Readiness 1 (Project-based)	0	1902478	Project Management	3
1902459	Geographical Information Systems	3		University Requirement (online course)	3
	Elective Specialization Requirement	3			
		15	**Total**		**12**

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Note: The second semester of the 4th year is designated as the exit semester of the program and is a closed semester. This means that the courses during this semester will be offered with a fixed timetable by the registration office. If a student has more than 6 credit hours remaining to complete their program, they must enroll in the Project Management course (if 9 credit hours remain) and a university requirement or other online course (if 12 credit hours remain) to meet the minimum credit hours required per semester. If a student has only 6 credit hours remaining, the exit semester will consist of Employment Readiness 2 (Project-based), Employment Readiness 3 (Skills-based), and Internship and Professional Certification. These courses cannot be taken outside of the exit semester. In cases where a student wishes to graduate earlier than the standard 4-year timeline, the exit semester can be offered in the first semester of the 4th year.

The exit semester begins with a competency-based exam conducted during the add/drop period of the exit semester, categorizing students into levels such as Exceptional, Proficient, Competent, Developing, and Needs Improvement. This exam assesses key areas critical to their field, including programming, problem-solving, analysis and design, and database management.

Based on the results, students receive intensive and customized training to address specific weaknesses and enhance their strengths. The program also includes a second chance for students who need to retake the exam after additional preparation. Passing this exam is mandatory for graduation, ensuring that all graduates meet a high standard of competency. The results are included in the students' transcripts, providing a clear indication of their skill levels to potential employers and enhancing their job prospects.

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Sixth: Course Description

Course Number: 1901101	Course Title: Discrete Mathematics	Credit Hours: 3
Prerequisite: (None)		
Course Description This course studies the mathematical elements of computer science and their applications. Topics include propositional logic; predicate logic; mathematical reasoning; techniques of proof; mathematical induction; set theory; number theory; matrices; sequences and summations; functions, relations and their properties, elementary graph theory, and tree (graph theory). In each subject, its characteristics, forms, ways of representing it, the operations used in it, and ways of linking these subjects together are studied. Homework will be assigned.		

Course Number: 1941102	Course Title: Introduction to Programming	Credit Hours: 3
Prerequisite: (Pass Qualification Exam or 1932099)		
Course Description This course provides a comprehensive introduction to programming, focusing on fundamental concepts and problem-solving techniques. While the primary language of instruction is C++, the course also introduces structural programming principles applicable across various languages. Students will explore essential programming constructs, including variables, data types, control flow, and modular design with functions. The course also covers strings, multi-dimensional arrays, and basic file handling techniques. Delivered in a lab environment, the course emphasizes hands-on exercises that simulate real-world programming challenges. Active learning methodologies foster both individual problem-solving and collaborative project work, laying a strong foundation for future learning in different programming paradigms. Assessment is based on practical coding tasks, a mid-term exam, and a final exam.		

Course Number: 1904101	Course Title: Fundamentals of Information Technology	Credit Hours: 3
Prerequisite: (None)		
Course Description This course will introduce the fundamental knowledge of information technologies, and it works as an introductory course for computer-related courses. It is a combination between a theoretical and a practical course. In particular, the course provides students with a grounding knowledge on several areas of information technologies including cutting edge technologies, careers in IT, basic concepts of cloud computing and web technologies, and a general perceptive of project management. Students are also going to be introduced practically to hardware maintenance, software diagnostics and technical support. In addition, critical thinking methodologies and techniques will be discussed, including numbering systems, flowcharts and related case studies. Operating systems such as LINUX/UNIX with, memory allocation, and an introduction to networks and security, and block chain concepts. The final part is concerned with technical applications needed such as excel, advanced excel, technical writing, report generating and type writing. Technical sections will be taught on lab sessions and group works. Active learning methodologies will be applied through role playing, presentations and problem-solving exercises.		

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Course Number: 1904120	Course Title: Web Applications Development	Credit Hours: 3
Prerequisite: (1941102)		

Course Description

This course aims to improve students' ability in Front-End Web applications development using client-side programming such as HTML 5, Cascading Style Sheet (CSS3), JavaScript. In addition, the students will learn the fundamental concepts of front-end web development frameworks such as Bootstrap and React front-end frameworks. The course will cover the Bootstrap framework, which is the most popular CSS framework for creating responsive mobile-first websites. This course will teach you how to create pages of a website using the Bootstrap v5 framework. In addition, the course also covers the basic concepts of the React framework such as Communicating with Props, Class-Based Components, State in React Components, Lifecycle Methods, Handling User Input with Forms and Events, Making API Requests with React, and Single Page Application Development. This course uses active teaching methodologies, such as weekly lab applied sessions, group work and technical projects.

Course Number: 1902110	Course Title: Object Oriented Programming	Credit Hours: 3
Prerequisite: (1941102)		

Course Description

The course aims to cover the fundamental concepts of OOP, such as Encapsulation and Information-Hiding, Inheritance, Polymorphism, and Abstraction. The course uses Java Programming language starting from the basic Java syntax based on Eclipse IDE. It focuses on the understanding and practical mastery of OOP principles and Java components, such as classes, objects, input/output, scanner objects (to read either from the keyboard or a file), loops, decision-making, array and multidimensional array, data abstraction, methods, method overloading, objects garbage-collector, an introduction to exception-handling, etc. Finally, it presents an introduction to JavaFX and its hierarchy based on Java inheritance OOP concepts, for developing rich client applications. Lectures will be given in the lab for practical application. This course is assessed through exams, practical tests and assignments.

Course Number: 1901242	Course Title: Data Structures	Credit Hours: 3
Prerequisite: (1902110)		

Course Description

This Course introduces the students to the concepts of data structures. Topics includes: Pointers, and pointer operations. Array implementation of lists, stacks, and queues. Dynamic implementation of lists (singly, doubly, circular), stack operations and queue operations (and their implementation as linked lists). STL, like: vectors, pairs, maps, sets, lists, stacks, queue. Recursion. Tree dynamic, like binary search trees, segment, red-black, AVL trees. Hash Table and Collision resolution. Weekly lab assignments will be given to the students and to be discussed throughg active teaching methodologies, in addition to problem solving tasks.

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Course Number: 1902224	Course Title: Database Management Systems	Credit Hours: 3
Prerequisite: (1902110)		

Course Description

The course aims 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 relational databases. Furthermore, it enables applying conceptual design methodologies for databases and learning about the architecture and environments of the database management system. Students will practice using database tools to create and manage database schemas systems and formulate DDL, DML commands and run SQL queries. Advanced SQL topics such as creating database functions, database Stored Procedures and database Triggers will be covered. Also, students will learn how to manage database privileges and design suitable security and integrity constraints for database schemas. Furthermore, the course will provide the students with practice project to connect a relational DB using a programming language, in addition to practice using basic Oracle Forms and Oracle Reports. This course will use a combination of traditional lectures, active teaching methodologies, and hands-on lab lectures.

Course Number: 1915101	Course Title: Linear Algebra for Computational Sciences	Credit Hours: 3
Prerequisite: (0301101)		

Course Description

The course uses linear algebra as one of the most important tools in applied mathematics, data science, and artificial intelligence to help students learn how to handle vectors and matrices, solve matrix-vector equations, perform Eigen value and Eigen vector and diagonalization analyses and use principal component analysis to do dimension reduction on real-world datasets. It covers topics such as: solving systems of linear equations; matrices and matrix operations; homogeneous and non-homogeneous systems; Gaussian elimination; elementary matrices and a method for finding A−1; determinants; Euclidean vector spaces; linear transformations from Rn to Rm and their properties; general vector spaces; subspaces; basis; dimension; row space; column space; null space of a matrix; rank and nullity; and inner product spaces. All analysis will be performed in python or any similar popular programming language. Lectures will be given in the lab for practical application. This course is assessed through exams, practical tests and assignments.

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Course Number: 1902390	Course Title: Seminar-Road to Software Industry	Credit Hours: 0
Prerequisite: (Passing 45 Hours)		

Course Description

IT students increasingly demand and require coverage of emerging technologies to prepare themselves for subsequent employment and research. Industry and professional bodies are also concerned that IT education does not always prepare students adequately for the world of work. This professional practice seminar course aims to contribute to solving these two issues by providing real-world experiences, inspiring students to choose their career path, and exposing them to the trends, methods, and techniques that are of current interest in software industry through a weekly seminar series. Professionals from software companies are invited to present different aspects of their companies and to share their first-hand experience with students. This course can enhance IT education and motivate students by covering leading-edge technologies and practices. After each seminar, students will submit a personal evaluation and short reports relevant to the seminar's presentation. Attendance and participation in 8 seminars, including the evaluation of each seminar and the short reports are the minimum requirements to pass the course.

Course Number 0301101	Course Title Calculus-1	Credit Hours 3
Prerequisite: (None)		

Course Description

Functions: domain, operations on functions, graphs of functions; trigonometric functions; limits: meaning of a limit, computational techniques, limits at infinity, infinite limits; continuity; limits and continuity of trigonometric functions; the derivative: techniques of differentiation, derivatives of trigonometric functions; the chain rule; implicit differentiation; differentials; Roll's Theorem; the mean value theorem; the extended mean value theorem; L'Hopital's rule; increasing and decreasing functions; concavity; maximum and minimum values of a function; graphs of functions including rational functions (asymptotes) and functions with vertical tangents (cusps); antiderivatives; the indefinite integral; the definite integral; the fundamental theorem of calculus ; the area under a curve; the area between two curves; transcendental functions: inverse functions, logarithmic and exponential functions; derivatives and integrals; limits (the indeterminate forms); hyperbolic functions and their inverses; inverse trigonometric functions.

Course Number: 0301131	Course Title: Principles of Statistics	Credit Hours: 3
Prerequisite: (None)		

Course Description

Describing statistical data by tables, graphs and numerical measures, Chebychev's inequality and the empirical rule, counting methods, combinations, permutations, elements of probability and random variables, the binomials, the Poisson, and the normal distributions, sampling distributions, elements of testing hypotheses, statistical inference about one and two populations' parameters.

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Course Number: 1902203	Course Title: Computing Ethics and Documentation	Credit Hours: 3
Prerequisite: (1904101)		

Course Description

This course aims to equip students with the necessary computing ethics and technical writing skills. It introduces computing ethics by adhering to the most well-known world standard code of ethics from national and international professional societies; organizations, and governmental bodies (CEI, ACM, IEEE, BCS, and E-crime, E-Transaction laws in Jordan and code of conduct in the University of Jordan). Topics covered include: Ethics in IT profession, programming ethics, AI ethics, ethical computing responsibility from the professional, philosophical and social perspectives, AI risks and the possibility of AGI and technological singularity, electronic crimes, computer abuse, cyberbullying and stalking, privacy, confidentiality, anonymity, ethics in social media and freedom of expression through the cyber space. In addition, it introduces different types of technical reports (books, articles, proposals, user manual, progress reports, graduation project, and memorandums) and how to write them professionally and ethically with proper data representation, citation, and referencing. This course covers ethical writing through many practical skills including referencing styles, citation (i.e., Endnote, Mendeley, RefWorks, and Zotero), quotation, and also through the awareness of the good document requirements, plagiarism forms, copy rights, fair use, creative commons, and intellectual property rights. This course will use a combination of lectures, group discussions, reading and writing assignments, case studies analysis, and hands-on work.

Course Number: 1902214	Course Title: Advanced Java Programming	Credit Hours: 3
Prerequisite: (1902110)		

Course Description

This course aims to introduce advanced programming skills based on core concepts of Object-Oriented Programming (OOP) and Design using Java programming language. It builds on the OOP course to finalize a Java full-stack application. This course starts with using some Java classes such as String, StringBuffer and StringBuilder, and StringtTokenizer for string-processing. It also focuses on I/O operations using files and streams, and JavaFX for developing rich client applications. In addition to, GUI components, event-handling, Generics, exception-handling, multithreading, and JavaFX Event-Handler using Inner Class, Anonymous Class, and Lambda Expression. Finally, it introduces databases connectivity using JDBC. The JDBC case study is based on MySQL Database and Eclipse IDE. Lectures will be given in the lab for practical application. This course is assessed through project, exams, practical tests and assignments.

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Course Number: 1902225	Course Title: Information Systems and Applications	Credit Hours: 3
Prerequisite: (1904101)		

Course Description

This course aims to help students understand the role of information systems (IS) in the enterprise and how these systems are created, utilized, and maintained. The course will focus on enterprise information architecture including the components of enterprise strategy, business, application, information, and infrastructure layers. Topics include: enterprise systems and integration, gaining competitive advantage with IS, business process reengineering and change management, structured approaches to the creation of IS, managing information systems; information systems for commerce and collaboration; business intelligence and enterprise information systems, decisions support systems, enterprise resource planning, supply chain management, customer relationship management, information security and privacy, and the implications of IS for people, enterprises and society. Healthcare environment is used throughout this course to explain the concepts and course contents. This course will use a combination of lecture, active teaching methodologies, self-reading assignments, case studies, and hands-on work.

Course Number: 1902226	Course Title: Health Information Management	Credit Hours: 3
Prerequisite: (1902224 and 1902225)		

Course Description

This course provides an in-depth understanding of managing health information in healthcare environments, focusing on the operational, legal, and technical aspects of health data governance. Students will learn how to manage electronic health records (EHRs), ensure data quality, apply health data standards (e.g., ICD, CPT), and oversee health information exchanges (HIE). The course covers the essential principles of health data collection, storage, retrieval, and sharing while maintaining compliance with legal and regulatory requirements, such as HIPAA and other privacy and security laws. Special attention is given to health information coding, the role of HIM professionals in maintaining the accuracy and security of health records, and the day-to-day processes involved in managing health information systems. The course equips students with the knowledge to handle the documentation, auditing, and governance of health information, ensuring the integrity and privacy of patient data. By the end of the course, students will be proficient in managing the lifecycle of health information, understanding how to apply data standards and regulatory compliance within healthcare settings, and supporting clinical and administrative decision-making through effective information management. The assessment of this course is through exams, quizzes, and assignments.

Course Number 1901341	Course Title Theory of Algorithms	Credit Hours 3
Prerequisite: (1901242)		

Course Description

The main goal of this course is to introduce complexity analysis of algorithms with an emphasis on efficient design techniques for solving various computational problems. Topics include complexity analysis including big O, big omega, and big theta notations. Recurrence equations and recursive algorithms. Algorithm design techniques include sequential, divide-and-conquer, greedy, and dynamic programming. Sorting algorithms include insertion sort, merge sort, heap sort, and quicksort. Searching algorithms include breadth-first search and depth-first search. Graph-based algorithms including Kruskal's algorithm. Optimization problems include minimum spanning tree and multistage graph problems. The assessment of this course is through exams, quizzes, and assignments.

Course Number: 1902325	Course Title: Health Informatics	Credit Hours: 3
Prerequisite: (1902226 and 0301131)		

Course Description

This course is designed to familiarize students with the fundamental principles, concepts, and technological elements of health informatics, focusing on the challenges and issues that health sector managers face in the planning, implementation, and evaluation of information systems. The course introduces students to the strategic application of information technology and data analytics in healthcare, focusing on how health informatics systems can improve patient care, streamline operations, and support data-driven decision-making. Students will explore the design, implementation, and evaluation of health information systems, including electronic health records (EHRs), health information exchanges (HIE), telemedicine, and mobile health technologies, with an emphasis on their role in improving healthcare quality and efficiency. The course provides a strong foundation in healthcare data analytics, teaching students how to apply quantitative analysis and predictive modeling to clinical and operational data for enhancing healthcare outcomes and optimizing resource management. In addition, students will learn how informatics tools are used to manage population health, enable personalized medicine, and monitor public health trends. The course also covers the ethical, privacy, and security considerations inherent in implementing and managing health informatics systems, ensuring compliance with regulations. Case studies and a term project will allow students to develop real-world informatics solutions, with a focus on data-driven innovations and the application of technology to solve healthcare challenges. Guest speakers with extensive experience in health IT may provide additional practical insights into current industry trends. The assessment of this course is through exams, case study analyses, practical projects, and presentations.

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Course Number: 1902384	Course Title: Health Information Security and Privacy	Credit Hours: 3
Prerequisite: (1902226 and 1901363)		

Course Description

This course offers a comprehensive overview of the security and privacy challenges specific to health information systems. It covers cryptographic techniques such as encryption, digital signatures, and public key infrastructures (PKIs), as well as network security concepts like firewalls, TLS, IPSec, and wireless security. Students will also explore authentication, authorization, and web security as applied to systems like electronic health records (EHRs) and health information exchanges (HIEs). In addition to technical safeguards, the course addresses risk assessment, ethical considerations, and regulatory compliance, including HIPAA and other privacy laws. Practical exercises and case studies provide students with hands-on experience in securing health data and managing privacy, preparing them to effectively protect healthcare systems. By the end of the course, students will be able to develop and implement security measures to protect sensitive health information, ensuring compliance with industry standards. Assessment includes projects, exams, and case study analyses.

Course Number: 1905320	Course Title: Artificial Intelligence	Credit Hours: 3
Prerequisite: (1901242)		

Course Description

The aim of the course is to enable students to solve problems using explicit knowledge and reasoning techniques and to develop expert systems for simple problems. Students will be able (1) to express knowledge of a simple domain in propositional and/or first-order predicate calculus, (2) to design and develop expert solutions to simple problems where AI techniques can be employed, and (3) to write simple programs in Prolog that reason about the available knowledge to achieve their goals. Furthermore, students will learn some simple blind and heuristic search algorithms such as depth-first, breadth-first, best-first, hill climbing, and simulated annealing and techniques on how to control search using production systems. They will also have the ability to decide the appropriate search techniques (blind or heuristic) for some problems. The students will also be given some grounding in the principal techniques of data mining and be introduced to some applications of data mining. Students will be introduced to some learning techniques to help obtain a clear picture of the concepts of machine learning. This course will use a combination of lectures, class discussions, reading and writing assignments, case studies analysis, and hands-on work.

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Course Number: 1902353	Course Title: Human Computer Interaction	Credit Hours: 3
Prerequisite: (1904120)		

Course Description

This course aims to introduce various Human Computer Interaction related topics. This course explains the components and steps of designing, developing, and evaluating interactive computer systems for human use. It also addresses the importance of Ergonomics, interaction design and its activities, data gathering and analysis, prototyping, evaluation paradigms and techniques universal design principles, and Non-traditional interfaces of all kinds. It also highlights the steps of designing graphical user interfaces to achieve usability and user experience in interactive systems. The course also presents the need to adopt ideas that serve users with special needs and impairments. The content of the course enables students to deploy interaction design principles into health-related applications (healthcare and patient management), where students are required to show the interaction design activities, prototyping, evaluation paradigms and techniques, and universal design principles in the project, which is considered one of the most important outcomes of the course where students apply everything they have learned in this course.

Course Number: 1902372	Course Title: Software Engineering	Credit Hours: 3
Prerequisite: (1902224)		

Course Description

This course aims is to present software engineering as a body of knowledge. The course is designed to present software engineering concepts and principles in parallel with the Software Development Life Cycle (SDLC). The course will begin with an introduction to software engineering, giving students a definition of this body of knowledge, as well as a discussion of the main methodologies of software engineering including agile methods i.e., XP. Students will then learn about the five major phases of the SDLC: requirements gathering and analysis, design, coding/implementation, validation, and evolution. This includes software modelling using Unified Modelling Language (UML), a standardized general-purpose modelling language used to create visual models of object-oriented software, for requirements gathering and analysis, and design. Students will also learn about project management and quality management for the purpose of delivering high-quality software that satisfies customer needs and is within budget and schedule. Delivery will be by in-class lectures, recorded lectures, practical sessions in the lab, case studies from different domains (i.e., healthcare domain), and assignments. Assignments will include a term project illustrative of professional practice in developing computer information systems. One or two guest speakers with many years of experience in software engineering will be invited to share their first-hand experience with students.

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Course Number: 1902328	Course Title: Healthcare Database Administration	Credit Hours: 3
Prerequisite: (1902226 and 1902224)		

Course Description

This course provides an in-depth exploration of advanced tools and techniques for database administration within the healthcare sector. Students will gain a solid understanding of fundamental principles and cutting-edge practices in database management systems, with a focus on the specific needs of health information systems. Key topics include advanced database design, implementation, and maintenance; data integrity and security; regulatory compliance (such as HIPAA); and the management of electronic health records (EHRs). The course emphasizes the use of contemporary technologies and methodologies to address real-world challenges in healthcare data management. Through practical exercises and case studies, students will gain hands-on experience with the latest tools and techniques, preparing them to effectively manage and safeguard healthcare data while ensuring accessibility and confidentiality. By the end of the course, students will be proficient in deploying and maintaining database systems tailored to the evolving needs of the healthcare industry.

Course Number: 1902310	Course Title: Mobile Development Frameworks	Credit Hours: 3
Prerequisite: (1904120 and 1902214)		

Course Description

This course aims to provide students with a foundational understanding of the technologies, methods, and skills required to design and develop applications for current and emerging mobile computing devices. In this course, students learn to develop mobile applications to solve business problems. Topics covered include different software platforms, tools for native and cross-platform app development (i.e., React Native, Flutter, Xamarin, Sencha), user interface, and database handling for mobile applications. Students are required to consider the impact of user characteristics, device capabilities, networking infrastructure, and deployment environment, to develop mobile applications that can meet the requirements of stakeholders. During the weekly practical tutorials, students use different frameworks, with a focus on the React Native and Flutter, in learning how to design and develop a range of mobile applications. At the end of this course, students will be able to independently make a mobile app for android and iOS that makes use of database, user authentication, app notifications, design principles, and user experience. The course hosts several experts in the field of development and IT operations from the local market to cover the practical side of the course and to share their first-hand experience with students.

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Course Number 1901363	Course Title Computer Networks	Credit Hours 3
Prerequisite: (1901242)		

Course Description

This course explores key concepts and essential technologies of computer networks and broad range of topics in networking. It includes general overview, networks applications, network classifications and topologies, network layers, channel performance measures, transmission media, communication network protocols and architecture; Data link layer: framing, error detection and correction, CSMA/CD, LAN IEEE standards; Network layer: IP service model, IP addressing, subnetting, host configuration DHCP, ARP Protocol, ICMP protocol; Transport layer: UDP protocol, TCP protocol, TCP reliable transfer and sliding window, TCP flow and congestion control; Application layer: DNS protocol, NAT protocol, HTTP protocol, persistent and non-persistent HTTP connection. Weekly practice in the lab through active teaching methodologies.

Course Number: 1902329	Course Title: Emerging Trends and Technologies in Health Informatics	Credit Hours: 3
Prerequisite: (1902226)		

Course Description

This Course explores cutting-edge advancements reshaping the field of health informatics. This course covers innovative technologies such as artificial intelligence, blockchain, telehealth, and the Internet of Medical Things (IoMT), focusing on their applications, benefits, and challenges in healthcare. Students will examine how these technologies enhance diagnostics, data management, and patient care, while also addressing regulatory, ethical, and implementation issues. The course prepares students to understand and leverage these emerging technologies to improve healthcare delivery, operational efficiency, and patient outcomes.

Course Number: 1902459	Course Title: Geographical Information Systems	Credit Hours: 3
Prerequisite: (1902214 and 1902225)		

Course Description

This course aims to introduce Geographic Information Systems (GIS) and their applications. Topics include: introduction to GIS, GIS components, vector and raster models, scale, resolution, map projection, coordinate systems, georeferencing, Global Positioning Systems (GPS) and remote sensing, uncertainty, GIS modelling and spatial analyses. Hands-on exposure to spatial analysis and modelling with GIS through the use of computers is provided during the laboratory practical demonstrations on using the state-of-the art GIS software package ESRI's ArcGIS.

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Course Number: 1902454	Course Title: Digital Image Processing	Credit Hours: 3
Prerequisite: (1902214)		

Course Description

This course aims to introduce the basic concepts, techniques, and algorithms of digital image processing. It explains the fundamental techniques of the following: acquisition of the digital images (equipment, sampling, quantization, and color representation), enhancement of digital images in spatial and in frequency domains (smoothing, sharpening, edge detection, thresholding, histogram equalization, morphological operations, etc.), conversion the digital image into Fourier and other transforms, feature identification, image compression, application to models of human and machine vision. In addition, students will be able to apply the image processing techniques to solve real-world problems in any domain. Specifically, students are required to work through a case study in the healthcare domain and show how to deploy the image processing techniques to perform enhancement, segmentation, analysis, diagnosis, etc. into the medical images. This course is given in the lab because it requires practical demonstrations on using the state-of-the-art Matlab-Image processing software package.

Course Number: 1902472	Course Title: Advanced Software Engineering	Credit Hours: 3
Prerequisite: (1902372)		

Course Description

This course aims to present advanced topics of software engineering including development approaches, process improvement, requirements analysis, software architecture design, architectural patterns, distributed system architecture, and service-oriented architecture (SOA). It presents software testing including: verification and validation, inspections, automated testing, and testing strategies. It also presents software maintenance, evolution, software reengineering, and software reuse. This course also covers dependable systems and software formal specification. It also discusses the emerging new technologies to application development, and application of engineering tools such as UML design tools and automated testing tools. Assignments involve a term project illustrative of professional practice in developing computer information systems.

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Course Number: 1902478	Course Title: Project Management	Credit Hours: 3
Prerequisite: (1902372)		

Course Description

This course aims to provide students with the required skills to plan and control information technology projects. It gives students an understanding of the different possibilities in developing projects' schedules, utilizing resources, determining costs, managing risks, and closing projects. The course covers the project management life cycle, the roles and responsibilities of a project manager, and the effective project management tools and techniques that drive successful project outcomes. It also examines project management methods in an agile environment. This course guides students through practical, hands-on approach through case studies and exercises. An information systems' project management case study in the healthcare domain constitutes a major part of this course. The topics that are covered each week are demonstrated using the case study to show how the project management process activities are deployed in healthcare systems. Students are required to work in teams to manage a real project and show how to break down the project's tasks into WBS and perform scheduling, estimation, risk analysis, etc. Progress reports should be submitted on a weekly basis.

Course Number: 1902474	Course Title: Systems Analysis and Design	Credit Hours: 3
Prerequisite: (1902372)		

Course Description

This course aims to provide students with a solid background in information systems analysis and design techniques, with a specific emphasis on healthcare applications. Through a combination of theory and practice, students will develop the skills necessary for the analysis and design of information systems tailored to the healthcare domain. Students will apply these skills in a step-by-step manner, from recognizing a problem to implementing a solution in a healthcare-related case study. The course is divided into four major parts: Systems Analysis Fundamentals (Part I), Information Requirements Analysis (Part II), The Analysis Process (Part III), and The Essentials of Design (Part IV). Instruction will combine traditional lectures with active teaching methodologies such as group discussions, problem-solving, case analysis, debates, and healthcare-specific case studies. Assignments will include a term project that reflects professional practices in healthcare information systems analysis and design, providing hands-on experience in creating solutions for real-world healthcare challenges. By the end of the course, students will be well-equipped to address the complex needs of the healthcare industry through effective system analysis and design techniques.

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Course Number 1901473	Course Title Operating Systems	Credit Hours 3
Prerequisite: (1901242)		

Course Description

This course introduces students to management of computer resources. It includes: definition and role of the operating systems, history of operating systems and development; functionality and structuring methods of a typical operating system; concepts of process versus thread, scheduling, dispatching and context switching, concurrent execution: the "mutual exclusion" problem and some solutions; deadlocks: causes, conditions, and methods for resolution; memory management; virtual memory management; mass-storage structure. The course will involve regular assignments and instructions on Linux Operating System to map different theoretical parts with Linux. Students will get introduced to using a Linux machine, will learn key important Linux configurations, and will perform Linux performance evaluations for different system resources. The lectures taught in the lab through active teaching methodologies individually or within groups.

Course Number: 1902490	Course Title: Employment Readiness 1 (Project-based)	Credit Hours: 0
Prerequisite: (Passing 90 Hours)		

Course Description

This course represents the first stage of the graduation project, focusing on foundational aspects that prepare students for the comprehensive employment readiness activities in their final exit semester. Students will work in teams to define and analyze current IT-related problems, develop a project proposal, and gather and analyze the necessary requirements. This course serves as a critical stepping stone towards the advanced project work and professional skills developed in the exit semester. Students must submit comprehensive project documentation and present their findings to a predetermined committee within the department. The course includes weekly meetings with supervisors to ensure continuous progress and guidance.

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Course Number: 1902491	Course Title: Employment Readiness 2 (Project-based)	Credit Hours: 3
Prerequisite: (1902490)		

Course Description

This course represents the culmination of the students' academic journey and the second stage of their graduation project, focusing on the advanced stages of software development while integrating critical employment readiness skills. Building upon the foundation laid in earlier courses and the practical experience gained during internships, students will complete the design, implementation, testing, and evaluation of their capstone projects. The course begins with an intensive phase of lectures and hands-on sessions that guide students through the complexities of real-world software development practices, including advanced implementation techniques, integration testing, and quality assurance. Students will also refine their technical documentation, preparing it for final submission. A key component of this course is the focus on employment readiness. Through targeted workshops and assessments, students will develop and enhance their professional portfolios, engage in mock interviews, and prepare for entry into the job market. The course also includes exit interviews and a final exam to assess students' readiness to transition into the workforce. Throughout the course, students will participate in collaborative review sessions, receive peer and instructor feedback, and integrate insights from their internships into their projects. The course culminates in a formal project defense, where students present their work to a faculty panel, showcasing their ability to manage complex software development projects from conception to completion.

Course Number: 1902492	Course Title: Employment Readiness 3 (Skills-based)	Credit Hours: 3
Prerequisite: (1902490)		

Course Description

This course is a critical component of the exit semester, designed to equip students with the specialized skills and knowledge necessary for immediate employment in the field of Computer Information Systems. The course combines intensive lectures, hands-on activities, and practical assessments tailored to the unique demands of the CIS program within KASIT. Students will engage in a series of targeted sessions that cover both technical and soft skills relevant to the industry, such as advanced problem-solving and critical thinking, DevOps and continuous integration/continuous deployment (CI/CD), web and mobile Application development: Frontend Development (React.js, or Angular for modern web interfaces), API development and integration, data management and analytics, UI/UX, enterprise systems integration, Test automation, Emotional intelligence, effective communication, and professional development. The course emphasizes real-world applications, preparing students for the job market by honing the specific competencies that employers seek in the information systems industry. Practical exercises simulate workplace scenarios, ensuring that students are not only knowledgeable but also job-ready. By the end of this course, students will have refined their professional portfolios, improved their interview skills, and be fully prepared to enter the workforce with confidence. Assessment includes a final exam to evaluate mastery of specialized content and an exit interview to assess overall readiness for employment, including the ability to articulate skills and experiences effectively.

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Course Number: 1902493	Course Title: Internship and Professional Certification	Credit Hours: 0
Prerequisite: (1902490)		

Course Description

This course is designed to provide students with valuable real-world experience through an internship in a relevant industry or organization. During the internship, students will apply their academic knowledge to practical situations, enhancing their professional skills and building a network in their chosen field. The internship allows students to demonstrate their ability to handle work pressure, solve problems in a real-world environment, and meet the expectations of a professional workplace. In addition to the internship, students are required to complete a recognized professional certification program relevant to their field of study. The certification must be approved by the department and can include options such as PMP or AWS Certified Solutions Architect. Completion of the certification is mandatory for passing the course and provides students with specialized, up-to-date knowledge and skills that enhance their resumes and give them a competitive edge in the job market. Assessment in this course includes dual evaluation by both an industry mentor and an academic supervisor, regular feedback sessions, and the submission of a portfolio and a final presentation reflecting on the internship experience and the skills gained through the certification process.

Course Number: 1902351	Course Title: Multimedia	Credit Hours: 3
Prerequisite: (1901242 And 1915101)		

Course Description

This course provides a comprehensive introduction to the theoretical concepts and practical applications of digital media, covering images, audio, animation, and video. Students will explore the differences between analog and digital media, focusing on how digital media is stored, encoded, and decoded. The course delves into various digital storage processes, including standards like GIF and file organization techniques. Students will also gain an understanding of digital media compression, learning both lossless and lossy techniques such as JPEG, MPEG, and H.26x video compression standards. The main algorithms used in these compression techniques are outlined, and students will examine performance considerations related to hardware, software, Internet-based broadcasting, and the differences between analog and digital formats. Lectures are conducted in a lab setting to facilitate practical application, allowing students to directly engage with the concepts being taught. Assessment is based on exams, practical tests, and assignments, ensuring a well-rounded understanding of both the theory and practice of digital media.

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Course Number: 1902355	Course Title: Computer Assisted Learning	Credit Hours: 3
Prerequisite: (1904120)		

Course Description

This course aims to introduce students to a variety of learning technologies and multimedia authoring tools to use for designing and developing effective eLearning. It discusses the essential concepts of designing engaging eLearning content for various learners who bring different needs, styles, and wants. Topics include Introduction to eLearning, Key Learning Theories, eLearning Development Methods, Dynamic Instructional Design Model, eLearning storyboarding with text, animation, and scenarios, Academic Software, Administrative Software, Virtual Reality, Augmented Reality, eLearning Authoring tools, and Learning Management Systems (LMS). Weakly practice in the lab. Students are required to work through a real project and create a mini-interactive e-Course using eLearning authoring tools.

Course Number: 1901359	Course Title: Computer Graphics	Credit Hours: 3
Prerequisite: (1901242)		

Course Description

This an introductory course to graphics systems and overview of computer graphics applications. Topics includes: graphics output primitives and its attributes; geometric transformations; three-dimensional object representations; graphical user interface and its attributes; introduction to OpenGL programming in C++ and its applications. Overview of well-known computer graphics software through a course project that covers 3D computer graphics. The lectures taught in the lab through active teaching methodologies individually or within groups.

Course Number 1902369	Course Title **Healthcare Cloud Computing**	Credit Hours 3
Prerequisite: (1902226 and 1901363)		

Course Description

This course explores the application of cloud computing technologies within the healthcare sector, focusing on how cloud solutions can enhance the management, scalability, and integration of health IT systems. Students will examine the benefits and challenges of cloud computing in healthcare, including data storage, security, and regulatory compliance. The course covers key topics such as cloud infrastructure, data management, and the integration of cloud-based applications like electronic health records (EHRs) and telemedicine platforms. Through practical examples and case studies, students will gain insights into deploying and managing cloud technologies to improve healthcare delivery and operational efficiency.

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Course Number: 1905222	Course Title: Data Mining	Credit Hours: 3
Prerequisite: (1902224 and 1915101)		

Course Description

This course provides the students with an introduction to data mining and knowledge discovery (KDD). 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 and association rules, sequential patterns, and sub-graph patterns; and explore their applications, Classification methods, such as decision trees, k-nearest neighbour, and Naïve Bayes, ensemble learning methods such as random forest …etc., outlier detection methods, such as Simple Statistical Methods and local outlier factor (LOF), cluster analysis techniques, such as k-means, hierarchical methods, and density based methods. Lectures will be given in the lab for practical application. Active learning methodologies will be applied through role playing, presentations and problem-solving exercises.

Course Number: 1905310	Course Title: Advanced AI Programming	Credit Hours: 3
Prerequisite: (1902214)		

Course Description

This course will focus on understanding of how to perform Machine Learning with Python. In this course, student will learn to understand and format problems to be solved using ML techniques. They will also gain knowledge representation skills for preparing data to be used in prediction tasks and they will acquire expertise in creating models by combing the data with algorithms in that can predict the future. Students will learn how to use Python and libraries such as it scikit-learn to create Machine Learning solutions. This course will cover an introduction to ML and applications, setting up a Python development environment correctly, complete machine learning tool sets, the various regression, classification and other ML algorithms performance metrics such as R-squared, MSE, accuracy, confusion matrix, precision, recall, etc., unsupervised Machine Learning (ML) algorithms such as Hierarchical clustering, k-means clustering etc., Jupyter (IPython) notebook, Spyder and various IDE, Communicating visually and effectively with Matplotlib and Seaborn, using of train/test, K-fold and Stratified K-fold cross validation to select correct model and predict model perform with unseen data, and much more.

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Course Number: 1905380	Course Title: Natural Language Processing	Credit Hours: 3
Prerequisite: (1905320)		

Course Description

The aim of the course is to introduce students to the concepts of Natural Language Processing and its applications. It discusses linguistic theories and computational techniques. The course covers the topics of Origins of Natural Language Processing (NLP); Language structure representation; The role of knowledge; Knowledge representation; Parsing techniques; Finite-state techniques; Recursive and augmented transition networks; Language ambiguity; Well-Formed constructs; Features and the lexicon; Language semantics; and Applications. Examples of NLP applications that are covered by this course include; machine translation, information retrieval, text summarization, reference resolution, question answering, parsing, sense disambiguation, morphological analysis, speech analysis and synthesis. Active learning methodologies will be applied through role playing, presentations and problem-solving exercises. Moreover, hands-on practice on using NLTK (Natural Language Toolkit) is weekly practiced in the lab. In addition, guest speakers belonging to the Jordan's ICT will demonstrate state-of-the-art practices and application of NLP.

Course Number: 1915370	Course Title: Machine Learning and Neural Networks	Credit Hours: 3
Prerequisite: (1905222)		

Course Description

This course will help students to develop basic understanding of principles of learning theory, theoretical and mathematical foundations of the machine learning and derive practical solutions using predictive analytics. In addition, it explains what machine learning is and how it is related to statistics and data analysis. The class will cover topics in regression, classification, mixture models, neural networks, basic deep learning, ensemble methods and reinforcement learning, hidden Markov models, and Bayesian networks, generative/discriminative learning, parametric/non-parametric learning, support vector machines, unsupervised learning, expectation maximization, dimensionality reduction, and kernel methods. The course will also discuss recent applications of machine learning, autonomous navigation, bioinformatics, speech recognition, and text and web data processing. Delivery will combine traditional lectures with other active teaching methodologies, such as group discussions, group solving problems, analysis of cases and debates, case study from different domains, and assignments.

Course Number: 1902458	Course Title: Certified Software	Credit Hours: 3
Prerequisite: (1902214)		

Course Description

This course offers a variety of intensive certificate programs, which help the student to be prepared to apply for a certificate according to the offered training. The course will be taught by qualified and certified instructors in different fields. The offered programs include: Advanced oracle PL/SQL program, Practices in Web Design program, Web data and APIs program, Java Developer program, .Net Developer program, Cisco Certified Network Professional Wireless, Oracle Certified Java Programmer, AWS Certified DevOps Engineer, Certified Data Management Professional (CDMP), and Certified Cloud Security. The course contains weekly practice in the lab.

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Course Number: 1904253	Course Title: Web Server Programming	Credit Hours: 3
Prerequisite: (1904120)		

Course Description

This course is intended to teach students the skills and techniques required to create fully functioning websites. Students will learn how to configure Internet services, design and publish dynamic and interactive web pages, implement both client and server-side scripting, and use data access technologies to manipulate databases. Specifically, students are introduced to the Visual Web Developer, and how to use it to design, build, configure server-side websites built using ASP.Net. In addition, the VWD is used to introduce building DB-based web applications and introduce the concepts of client state management and web services. This course uses active teaching methodologies, such as weekly lab applied sessions, group work and technical projects. In addition, speakers from the industry will be invited to discuss case studies and show the latest trends on the industry.

Course Number: 1902383	Course Title: Information Technology Entrepreneurship and Innovation	Credit Hours: 3
Prerequisite: (1902224)		

Course Description

This course is to introduce students to new and innovative technologies and examine how these powerful systems have fundamentally reshaped modern organizations. These new information technologies are being used to change how organizations operate, produce products and services, and communicate both internally and as well as with external partners. Using online collaborative technologies that were developed in the context of social networking and online communities and data-driven and Artificial Intelligence technologies, corporations are reengineering both internal business processes and those related to customers, suppliers, and business partners. Developing innovative ways to communicate and collaborate can lead to new business opportunities and new efficiencies. This course investigates the technologies, methods, and practices of developing new innovations such as online communities, data revolution, and the Artificial Intelligence paradigms to reengineer business processes and develop innovative, value-adding, and sustainable business activities within existing corporations and new start-ups. The students will learn how to translate innovative, data-driven, and AI ideas into concrete project requirements, develop technological solutions, launch a business venture, and assess its effectiveness. Delivery will combine traditional lectures with other active teaching methodologies. A case study of innovative Healthcare Information Systems (HCIS) is selected for discussion throughout the course to highlight basic concepts of innovative HCIS project development. Students are advised to develop innovative solutions for simple problems in HCIS.

Course Number: 1902324	Course Title: Database Technologies and Applications	Credit Hours: 3
Prerequisite: (1902224)		

Course Description

This course aims to introduce the students to emerging topics in database systems. The course is specially designed with an emphasis on advanced and emerging concepts in database systems such as Big data management, data management with cloud platforms, NoSQL databases, and Graph databases. The course will allow students to focus on topics that are state-of-the-art research and recent technologies in the field of database and information systems. The course contains weekly practice in the lab.

Course Number: 1902380	Course Title: User Interface/Experience Design	Credit Hours: 3
Prerequisite: (1902353)		

Course Description

This course aims to teach students the knowledge and skills required to design and create cohesive and consistent user experiences and functional interface design with a focus on maximizing productivity and user satisfaction. Students will learn both the theory and practice behind the design thinking process. Ultimately, the course will use design thinking to take students through the design of the User Experience (UX) and User-Interface (UI) of a product or service of their creation. Students will learn about interface elements that anticipate what users might need to do and use them to facilitate actions that help with task completion, efficiency, and satisfaction. Students will also learn how to design, develop, and validate the designs created with user testing. Some example tools and methods to be covered include personas, scenarios, storyboards, focus groups, wireframing, prototyping, InVision, Axure, Balsamiq, etc. Delivery will combine traditional lectures with other active teaching methodologies, such as group discussions, group solving problems, analysis of cases and debates, and assignments. Students will participate in a final group project designing for a real context where a local industry client will define their needs and requirements, with the end goal that the students' design will be incorporated into the client's real product.

Course Number: 1902381	Course Title: Business Process Re-engineering	Credit Hours: 3
Prerequisite: (1902225)		

Course Description

This course aims to focus on the application of industry 'best practice' strategies, tools, and techniques in business process management to re-engineer organizations' business processes. Students will learn about key business process management concepts, and how to apply a proven five (5) phase methodology to re-engineer business processes in 'real world' organizational situations. Students will also learn how to implement process reengineering solutions effectively though prescribed syllabus as well as through ISO standards. We will combine traditional lectures with other active teaching methodologies, such as group discussions, group solving problems, analysis of cases and debates. Delivery will combine traditional lectures with other active

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teaching methodologies, such as group discussions, group solving problems, analysis of cases and debates. Class participation is a fundamental aspect of this course. Upon successful completion of this course, students would be equipped to carry out BPR initiatives within their future organizations, to produce better performing business processes.

Course Number: 1902326	Course Title: Information and Knowledge Management	Credit Hours: 3
Prerequisite: (1902225)		

Course Description

The course aims to provide students with different theoretical and practical premises build capabilities to manage information and knowledge within and across organizational boundaries. An emphasis is paid into information and knowledge management (IKM) from organizational perspective. This course provides an overview of the epistemology of information and knowledge, their practical implications in the organizational context and how to develop and create knowledge from information by making use of different methods and models of knowledge creation and management. Topics covered include: information management (IM) cycle, IM versus knowledge management (KM), KM cycle, KM models, KM tools and technologies, issues in building KM systems, KM strategy, the value of KM, KM team, and future of KM. The course adopts an active learning approach. Students are required to complete all required readings, attend all class lectures, complete graded activities and assignments, and participate in all class activities and their group final presentation.

Course Number: 1911351	Course Title: Security of Web Applications	Credit Hours: 3
Prerequisite: (1902224 And 1904120)		

Course Description

This course introduces students to a foundation in the theories and practice relating to web application security. Topics covered: web applications vulnerabilities and attacks, building secure web applications, concepts associated with deploying and securing a typical HTTP environment as well as defensive techniques that can be employed. Teaching of this course will be based on active learning methodology such that students will work in groups to discuss and analyze the vulnerability in web applications.

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Course Number: 1902327	Course Title: Intelligent Information Systems	Credit Hours: 3
Prerequisite: (1902225 and 1905320)		

Course Description

This course aims to help students understand how intelligent techniques can be used in the construction of information systems to support management decision making, and to acquaint students to the fundamental concepts and state-of-the-art intelligent information systems (IIS). In this course, students will determine which of the information system's individual components can be equipped with "intelligence" using artificial intelligence techniques for knowledge representation, information processing, fusion, and decision making. This course will highlight foundation knowledge of unimodality, bimodality, and multimodality intelligent systems using single or combined human physiological and behavioural biometrics such as voice, fingerprint, iris, handwritten signature, gait, and others. Topics covered include knowledge representation, knowledge acquisition, agent-based models for developing intelligent autonomous systems (i.e., Belief–desire–intention models, Markov Decision Process), handling inconsistency in knowledge, information fusion under uncertainty approaches, and real-world application scenarios (i.e., recommender systems using dimensionality reduction and machine learning). This course will combine traditional lectures with other active teaching methodologies, such as group discussions, group solving problems, analysis of cases and debates, case studies, and assignments. At the end of the course, students are required to develop an "intelligent" application that could be integrated with a traditional information system.

Course Number: 1902382	Course Title: Development and Operations (DevOps)	Credit Hours: 3
Prerequisite: (1902372)		

Course Description

DevOps is a collaboration between Development and Operations to make software production and deployment in an automated and repeatable manner. This course aims to provide the knowledge and skills to design and implement DevOps processes and practices. Students will learn how to plan for DevOps, use source control, scale Git for an enterprise, consolidate artifacts, design a dependency management strategy, manage secrets, implement continuous integration, implement a container build strategy, design a release strategy, set up a release management workflow, implement a deployment pattern, and optimize feedback mechanisms. Topics include: introduction to DevOps, DevOps on Cloud, GIT – a version controlling tool, Jenkins, Docker, Kubernetes, and Ansible. The course will host a number of experts in the field of development and IT operations from the local market to cover the practical side of the course and share their first-hand experience with students.

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Course Number: 1902479	Course Title: Information Systems Audit and Quality Assurance	Credit Hours: 3
Prerequisite: (1902372 and 0301131)		

Course Description

This course aims to help students understand the concepts and methods of IS auditing, as well as the techniques and processes for assuring that the developed software is of the highest quality possible. Topics covered in this course include: IS audit procedures and how they are applied during the IS development, the need for software quality assurance (SQA), SQA scope and roles, project quality management, inspections, audits, metrics and building the QA team. In addition, the course gives students an understanding of information controls, types of controls and their impact on organizations and how to manage and audit them. After successful completion of the course, students are expected to be able to create and apply SQA plans, create and manage a SQA team, conduct inspections, reviews and audits, create a control structure with goals and objectives, audit an information technology infrastructure, establish a systematic remediation procedure for any inadequacies, create and maintain appropriate metrics to measure quality, and apply SQA methods in an agile environment. Delivery will combine traditional lectures with other active teaching methodologies and assignments.

Course Number: 1902494	Course Title: Special Topics	Credit Hours: 3
Prerequisite: (1902225)		

Course Description

This course is designed to cover emerging issues or specialized content not represented in the main curriculum. It covers topics in advanced areas of Computer Information Systems (CIS). The course content changes from one semester to another. There will be writing reports on recent topics in the field of CIS which are covered in the course and practical application according to the nature of the topics.

Course Number: 1902481	Course Title: Game Development	Credit Hours: 3
Prerequisite: (1902214)		

Course Description

This course aims to teach the core software component of a computer game engines design, video games and interactive application with real-time graphics. The course provides the underlying technologies to simplify development and to enable the game to run on multiple platforms. The students will be able to learn the core functionalities that are typically provided by a game engine including a rendering engine for 2D or 3D graphics, a physics engine or collision detection (and collision response), sound, scripting, animation, artificial intelligence, and a scene graph. In addition, students are introduced to Gamification, which refers to the use of design principles and features from games in the design of information systems, processes, and services to afford similar experiences and motivations as games do, and consequently, attempting to affect user behaviour. Therefore, students will apply theories, methods, and gamification techniques for complex problems, and learn types of gamification, deconstructing games, game elements, game design thinking, behavioural psychology, gamified system design, gamification platforms, and gamification applications. The course covers theory and practical aspects in the lab.

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Course Number: 1905453	Course Title: Virtual Reality	Credit Hours: 3
Prerequisite: (1902454)		

Course Description

This course introduces the basic principles of Virtual Reality and its applications. The necessary hardware and software components of interactive 3D systems as well as human factors are discussed. The material is reinforced by practical assignments and projects. The topics will be as follows: applications, human sensory/motor system & capabilities. History of VR and AR, differences between VR/AR and normal experience. Virtual Reality Technology (VR): VR input devices, filtering & tracking, VR output devices, Augmented Reality (AR) hardware, spatial audio, and haptic. This course aims to make students know the basic concept and framework of virtual reality, teach students the principles and multidisciplinary features of virtual reality, teach students the technology for multimodal user interaction and perception in VR, in particular the visual, audial and haptic interface and behaviour, and provide students with an introduction to the VR system framework and development tools. Active learning methodologies will be applied through role playing, presentations and problem-solving exercises. Moreover, hands-on practice on virtual reality applications will be weekly practiced in the lab.

Course Number: 1905430	Course Title: Internet of Things	Credit Hours: 3
Prerequisite: (1905320 and 1901363)		

Course Description

This course aims at preparing students to the IoT market, given the increasing demand for professionals on this hot emerging area. The course presents the latest IoT applications, devices, technologies, architecture, communication protocols and trends. IoT middleware/streaming applications used in IoT will be reviewed. IoT challenges including cybersecurity challenges, skills needed, and best practices will also be covered. Part of the course will deal with developing real-world IoT applications/mobile application prototypes from the sensor design to the end-user applications to solve existing problems in society. Moreover, the course utilizes artificial Intelligence algorithms to build models and large-scale systems to solve problems such as telco management, intelligent transportation, urban planning, real-time crowd management, retail intelligence, and industry 4.0 using telco and other data sources. It also introduces typical application scenarios in which IoT provides innovative new services to enhance productivity and save costs. Active learning methodologies will be applied through role playing, presentations and problem-solving exercises. Moreover, hands-on practice on developing real-world IoT applications will be weekly practiced in the lab. In addition, guest speakers belonging to the Jordan's ICT will demonstrate state-of-the-art practices and application of IoT.

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Course Number: 1904487	Course Title: e-Payment Systems	Credit Hours: 3
Prerequisite: (1902384)		

Course Description

Financial technologies are drastically changing the financial services industries. This course introduces major techniques used in e-payment services such blockchain and cryptocurrencies, Bitcoin, Ethereum, smart contracts, decentralized applications, smart contracts, alternative and P2P lending and crowdfunding, and robo-advising. Students are expected to develop a broad understanding of the recent FinTech development and its impact in the financial industries. Students will also have hands-on and problem-solving experiences that can be useful in e-payment applications. This course uses active teaching methodologies, such as weekly lab applied sessions, group work and technical projects. In addition, speakers from the industry will be invited to discuss case studies and show the latest trends on the industry.

Course Number: 1905382	Course Title: Digital Speech Processing	Credit Hours: 3
Prerequisite: (1905320)		

Course Description

This course aims to provide students with the foundation knowledge on speech production and perception along with processing of speech signal in digital domain. It helps students to design, develop, and evaluate intelligent systems that are based on human speech biometric. Various applications will be taught in this course including Automatic Speech Recognition, Automatic Speech Synthesis, Automatic Speaker Recognition, Automatic Dialect Recognition, Automatic Emotions Recognition, Automatic Speech to Speech Translation, Conversational Agents, and many others. The state-of-the-art digital speech processing tools and algorithms and written and spoken language resources will be covered in this course. Active learning methodologies will be applied through role playing, presentations and problem-solving exercises. Moreover, hands-on practice on developing automatic speech processing applications will be weekly practiced in the lab.

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