Hashemite University
Faculty of Prince Hussein bin Abdullah II for information technology
Department of Computer Science and Applications

2015 plan
2014/12/08

Requirements for obtaining a bachelor's degree:-

- **The minimum credit hours for a bachelor's degree in computer science is (132) in accordance with instructions of the plan.**

- **The distribution of credit hours required for a bachelor's degree in computer science as follows:-**

Number of credit Hours		
1- **University Requirement**		27
A. Mandatory	12	
B. Optional	15	
2- **Faculty Requirement**		22
A. Mandatory	22	
B. Optional	---	
3- **Specialization Requirement**		80
A. Mandatory	68	
B. Optional	12	
4- **Selective Courses**		3
Total	132	

Meaning the status of Second digit of Courses numbers

Subjects of specialization title	Field Code
Introduction	0
Programming Language	1
Devices and networks	2
Software Systems	3
Basic math of computers	4
Algorithems	5
Artificial Intelligence	6
Computer systems applications	7
Practical Training	8
Special topics, project	9

Example:

Introduction In programming						151001100	
15	1	0	0	1	1	0	0
Plan Year	Faculty		Department		Levels	Field	Sequence

First: University Requirements: (27) twenty-seven credit hours distributed as follows:

Mandatory University Requirements (12) twelve credit hours:

Pre-Request	Credits hours	Week Hours		Course Name	Course Number
		Practical	Theoretical		
–	3	0	3	Military science	111404117
–	3	0	3	National education	111404118
Level exam in Arabic or 121601099	3	0	3	Arabic Language	121601101
Level exam in English or 121602099	3	0	3	English Language	121602101

2. University Requirements Optional (15) fifteen credit hours the student's choice of material contained in the following list, provided that the student is considering a minimum one article from each group and a maximum of two articles of each group, and the following groups include areas, namely: -
1. humanities.
2. the social sciences and economic.
3. field of science and technology, agriculture and health.

A. From (3-6) three to six credit hours chosen from the fields of the humanities:

Credits hours	Week Hours		Course Name	Course Number
	Practical	Theoretical		
3	0	3	Islam and Contemporary Issues	111404110
3	0	3	Islamic Thought	111404111
3	0	3	Jerusalem history	111404112
3	0	3	The principles of art and beauty in literature	111404113
3	0	3	Jordan's history and civilization	111404114
3	0	3	Arabic language application	121601105
3	0	3	Applied English Language	121602102
3	0	3	Technical translation	121602103

B. From (3-6) three to six credit hours from the fields of social and economic sciences:

Credit Hours	Week Hours		Course Name	Course Number
	Practical	Theoretical		
3	0	3	The student and the university	111404101
3	0	3	Introduction to Psychology	111404102
3	0	3	Life Skills	111404103
3	0	3	Family and Child Education	111404104
3	0	3	Sociology	111404115
3	0	3	Archeology and tourism	111404116
3	0	3	Economics and management	111404120
3	0	3	Law in our lives	111404121
3	0	3	Principles of Sign Language	111404122

C. From (3-6) three to six credit hours chosen from the fields of science and technology, agriculture and health:

Credit Hours	Week Hours		Course Name	Course Number
	Practical	Theoretical		
3	0	3	Energy and resources	110108104
3	0	3	Biotechnology and Society	110108113
3	0	3	Basics of car mechanics	110108114
3	0	3	Computer Ethics	110108115
3	0	3	Health promotion and nutrition	110108130
3	0	3	Health education and first aid	110108131
3	0	3	Sport and Health	110108132
3	0	3	Environmental awareness	110108133

Second: Faculty Requirements: (22) Twenty-two credit hours, include the following Courses

Pre-Request	Practical	Theoretical	Credit Hours	Course Name	Course Number
--	0	3	3	Calculus 1	110108101
--	0	3	3	Principles of Statistics	110108103
	0	3	3	Introduction to Programming	151001100
In Parallel with 151001100	2	0	1	Labatory Introduction to Programming	151001101
110101152	0	3	3	Digital Logic Design	151001123
--	0	3	3	Discrete Mathematics	110101152
151001111	0	3	3	Data Structures	151001250
151001110	0	3	3	Basics of Software Engineering	151003260

Third: Specialization requirements: - (80) Eighty credit hours distributed as follows:
Mandatory specialization requirements (68) Sixty-eight credit hours, namely: -

Pre-Request	Week Hours		Credit Hours	Course Name	Course Number
	Practical	Theoretical			
110108101	0	3	3	Calculus 2	110101102
--	0	3	3	Linear 1	110101241
151001250	0	3	3	Design and organization of computer	150408343
110408240	0	3	3	Basics of Computer Architecture	150408240
151001101	0	3	3	Object oriented programming 1	151001110
In Parallel 1510011100	3	0	1	Object oriented programming lab 1	151001111
151001110	0	3	3	Object oriented programming 2	151001212
In parallel with 151001212	3	0	1	Object oriented programming lab 2	151001213
151001110	0	3	3	Visual programming	151001214
In parallel with 151001214	2	0	1	Visual programming lab	151001215
110101152	0	3	3	Theory	151001240
110408240	0	3	3	Computer Networks	151001320
151001214	0	3	3	Multimedia	151001330
110101241 And 151001110	0	3	3	Numerical Methods	110101408
151001250	0	3	3	Algorithms	151001351
151002240 or 151001212	0	3	3	Web Programming	151001370
In parallel with 151001370	2	0	1	Web Programming lab	151001371
151001320	0	3	3	Wireless Networks	151001421
151001320	0	3	3	Network Security	151001422
110408240	0	3	3	Operating Systems	151001431
151001250	0	3	3	Artificial Intelligence	151001460
Complete 80 Hours	0	-	0	Practical Training	151001480
Complete 80 Hours	0	1	1	Graduation Project 1	151001490
151001490	4	-	2	Graduation project 2	151001491
151003260	0	3	3	Project management	151003436
110408213 OR 151001250	0	3	3	Introduction to Database	151002240
In Parallel With 151002240	2	0	1	Introduction to Database lab	151002241
151002240	0	3	3	System Analysis and design	151002470

B-optional requirements and allocated (12) Twelve credits from the following Courses:

Pre-Request	Week Hours		Credit Hours	Course Name	Course Number
	Practical	Theoretical			
110101408	0	3	3	Operations Research	151001341
151001351	0	3	3	Bioinformatics	151001372
151001250	0	3	3	Simulation methods	151001373
151001212	0	3	3	Computer vision	151001375
151001370	0	3	3	The design of programming languages	151001416
151001250 or 151001240	0	3	3	Building compilers	151001432
151001250	0	3	3	Computer graphic	151001374
Complete 80 Hours	0	3	3	Special Topics in computer science	151001492
151001351	0	3	3	Data mining	151002351
151001212	0	3	3	Design and implementation of the user interface	151003437
151002240	0	3	3	IT systems	151002377
151002240	0	3	3	Information Systems Management	151002374
151001320	0	3	3	Internet protocols	151001423

Fourth: Selective Courses: three (3) credit hours.
The student's choice of Courses offered by the university colleges.

Fifth: training
A student has to finish 8 weeks of traning inside or outside Jordan, he has to work 40 hours a week. Before the student starts his training, he has to get a confermation from his departoment. Student can't do his training without finishing an 80 cridet hours.

Courses offered by the Computer Science and Applications Department

Pre-Request	Week Hours		Credit Hours	Course Name	Course Number
	Practical	Theoretical			
--	0	3	3	Introduction to programming	151001100
In parallel with 151001100	2	0	1	Introduction to programming lab	151001101
151001101	0	3	3	Object oriented programming 1	151001110
In parallel with 151001110	3	0	1	Object oriented programming lab 1	151001111
151001111	0	3	3	Data Structures	151001250
151001110	0	3	3	Object oriented programming 2	151001212
In parallel with 15 1001212	3	0	1	Object oriented programming lab 2	151001213
151001110	0	3	3	Visual Programming	151001214
in parallel with 151001214	2	0	1	Visual Programming lab	151001215
150101152	0	3	3	Theory	151001240
151001214	0	3	3	Multimedia	151001330
151001250	0	3	3	Algorithms	151001351
151002240 OR 151001212	0	3	3	Web Programming	151001370
151001370	2	0	1	Web Programming lab	151001371
151001250	0	3	3	Artificial Intelligence	151001460
110408240	0	3	3	Computer Networks	151001320
151001351	0	3	3	Bioinformatics	151001372
151001250	0	3	3	Simulation methods	151001373
110101408	0	3	3	Operation Research	151001341
Complete study of 80 Hours	0	1	1	Graduation Project 1	151001490
151001490	4	0	2	Graduation Project 2	151001491
110408240	0	3	3	Operating Systems	151001431
151001320	0	3	3	Wireless Networks	151001421
151001320	0	3	3	Network Security	151001422
Complete study of 80 Hours	-	-	0	Practical Training	151001480
151001250 OR 151001240	0	3	3	Compilers	151001432
151001370		3	3	The design of programming languages	151001416
Complete study of 80 Hours	0	3	3	Special Topics in Computer Science	151001492
151001250	0	3	3	Computer graphic	151001472
151001212	0	3	3	Computer vision	151001375
110101152	0	3	3	Digital Logic Design	151001123

Course Description for 2015

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001100	Introduction to Programming	3	3	0	-

Course Description
Introduce to the student the programming concepts using the C++ language. The course covers the fundamental concepts for analyzing problem statements, designing computer solutions, as well as an introduction into the syntax and semantics of the C++ language. It also focuses on Data types, variables, constant, Operators and expressions, Control flows, Functions, Arrays, and classes.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001101	Introduction to Programming Lab	1	0	2	With 151001100

Course Description
The course provides students with basic understanding of C++ programming language. It shows students the ideal way to create programs by c++ language. It introduces the history of computer programming languages, and in more details covers the C++ programming languages by study the syntaxes and rules of C++ languages.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001110	Object Oriented 1	3	3	0	151001101

Course Description
This course provides students with a comprehensive study of the Java Programming Language. The course stresses the object paradigm including classes, inheritance, virtual functions, and templates in the development of Java programs. Lab exercises reinforce the lectures.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001111	Object Oriented 1 lab	1	0	3	With 151001110

Course Description
The objectives of the course are to have students identify and practice the object-oriented programming concepts and techniques, practice the use of Java classes and class libraries, modify existing Java classes, develop Java classes for simple applications, and practice the concepts of Object-Oriented Analysis and Design (OOA/OOD) and design patterns and frameworks by developing a Java based project.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001212	Object Oriented 2	3	3	0	151001110

Course Description
This course teaches the fundamental ideas behind the object-oriented approach to programming; through the widely-used Java programming language. Concentrating on aspects of Java that best demonstrate object-oriented principles and good practice, students will gain a solid basis for further study of the Java language, and of object-oriented software development.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001213	Object Oriented 2 Lab	1	0	3	With 151001212

Course Description
This course presents a conceptual and practical introduction to imperative and object oriented programming, exemplified by Java. As well as providing a grounding in the use of Java, the course will cover general principles of programming in imperative and object oriented frameworks. The course should enable you to develop programs that support experimentation, simulation and exploration in other parts of the Informatics curriculum (e.g. the capacity to implement, test and observe a particular algorithm).

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001214	Visual Programming	3	3	0	151001110

Course Description

Introduction to the principles of programming for Windows in Visual Basic. Event driven programming. Control structures. Data types and structures. Properties, events, and methods of forms controlling. Modular programming.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001215	Visual Programming Lab	1	0	2	With 151001214

Course Description

Visual programming environment, Hands on practicing using one of the visual programming languages such as VB.Net. Developing programs using object oriented programming, Building user interface forms, connecting to Database.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001370	Programming of internet applications	3	3	0	151001212 او 151002240

Course Description

Quick review of the Internet and Internet programming concepts, Web Servers and Web Application Servers, Design Methodologies with concentration on Object- Oriented concepts, Client-Side Programming, Server-Side Programming, Active Server Pages, Database Connectivity to web applications, Adding Dynamic content to web applications, Programming Common Gateway Interfaces, Programming the User Interface for the web applications.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001371	Programming of internet applications lab	1	0	2	With 151001370

Course Description

Design static web pages using HTML, Designing and developing dynamic pages using one of the modern technologies and frameworks such as ASP.net, Accessing databases using ADO.net. This course should include a design of web application.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001375	Computer Vision	3	3	0	151001212

Course Description

Introduction to the basic concepts in computer vision. First, an introduction to low-level image analysis methods, including image formation, edge detection, feature detection, and image segmentation. Image transformations (e.g., warping, morphing, and mosaics) for image synthesis. Methods for reconstructing three-dimensional scene information using techniques such as depth from stereo, structure from motion, and shape from shading. Motion and video analysis. Three-dimensional object recognition.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001240	Theory of Computation	3	3	0	110101152

Course Description

Language theory includes: regular expressions, regular languages, finite automata (deterministic and non-deterministic), Context-Free Languages, Pushdown automata, and language grammars, simple introduction to Turing machines.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001250	Data structures	3	3	0	151001111

Course Description

Present fundamental techniques in the design and analysis of data structures using Java Programming Language. Fundamental 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.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001123	Digital logic design	3	3	0	110101152

Course Description

A modern introduction to logic design and the basic building blocks used in digital systems, methods for designing digital circuits, implementation of systems computer systems, control systems and other applications which demand digital hardware. Topics include: Numbering systems, conversion methods, binary and complement arithmetic, Boolean algebra, circuit minimization techniques, Combinational circuits: Adders, Decoders, Encoders, Code Converters, Sequential Circuits: flip-flops, counters, registers, synchronous sequential circuits.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001330	Multimedia Programming	3	3	0	151001214

Course Description

Various elements of multimedia developmental environment: hardware and software such as: text, sound, images, animation, video, multimedia authoring techniques, multimedia approaches on Web including digitizing of audio and video multiple types of audio, images, video and animation, broadcasting techniques. Planning and producing multimedia projects, testing and deliver, compression algorithms and digital audio conversion.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001351	Algorithms	3	3	0	151001250

Course Description:

The design and analysis of computer algorithms, growth of functions, recurrences, sorting, divide-and-conquer, binary search tree, red black tree , dynamic programming, greedy algorithms, graph searching and graph algorithms, flow networks, bipartite matching, NP-completeness.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001460	Artificial Intelligence	3	3	0	151001250

Course Description

Rapidly-developing fields of artificial intelligence (AI): general knowledge representation techniques and problem solving strategies, classical and heuristic search techniques, rule-based systems, production system, stochastic system, prepositional and first order logic, fact representation in logic and logic programming (Prolog). Natural language processing, machine learning, expert systems, reasoning, neural network.

Number	Name	Hours	Theoretical	Practical	Prerequisite
110408240	Computer Organization	3	3	0	151001250

Course Description

Understand how computer systems get into action, computer components, computer arithmetic's, processor structure and function, instruction sets, internal memory, I/Os and external memory.

Number	Name	Hours	Theoretical	Practical	Prerequisite
110408343	Computer Architecture	3	3	0	110408240

Course Description

Understand the behavior of computer systems in various applications, computer evaluation and performance, computer unit operation, micro-programmed control, reduced instruction set computers, instruction-level parallelism and superscalar processors, and parallel processing.

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Number	Name	Hours	Theoretical	Practical	Prerequisite
151001320	Computer Networks	3	3	0	110408240

Course Description

Principles, design, implementation, and performance of computer networks, ,Internet protocols and routing, local area networks, wireless communications and networking, performance analysis, congestion control, TCP, network address translation, multimedia over IP, switching and routing, mobile IP, peer-to-peer networking, network security.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001422	Network Security	3	3	0	151001320

Course Description

Theory and practice of computer security, focusing in particular on the security aspects of the web and Internet. Cryptographic tools used to provide security, such as shared key encryption (DES, 3DES, RC-4/5/6, etc.); public key encryption, key exchange, and digital signature (Diffie-Hellmann, RSA, DSS, etc.). Utilizing these concepts in the internet protocols and applications such as SSL/TLS, IPSEC, Kerberos, PGP, S/MIME, SET, and others (including wireless). System security issues, such as viruses, intrusion, and firewalls, will also be covered.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001431	Operating Systems	3	3	0	110408240

Course Description

Concepts and principles of operating systems, structure and services, processor scheduling, thread, virtual machine, processing synchronization, deadlocks, concurrent processes, memory management, virtual memory, input/output, secondary storage management, and file systems.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001421	Wireless networking	3	3	0	151001320

Course Description

The design and implementation of wireless networks and mobile systems, the science and technology behind wireless networks, comprehensive view of the electromagnetic spectrum, mobile computing concepts and applications, the concepts of frequency and wavelength, radio propagation and attenuation, telecommunications via wireless, technology offerings, frequency allocations, and types of wireless technologies and their appropriate application, Wireless LAN technology, TCP/IP suite and subnetting, and IEEE 802.11 wireless LAN standard.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001372	Bioinformatics	3	3	0	151001351

Course Description

Sequence comparison algorithms and the software program FASTA as well as related programs, Sequence database searching with BLAST, PSI-BLAST, and HMMER, Functional database searches with GO and PFAM for gene identification and functional assignment, Biology database design using SQL/ my SQL, Programming to solve text processing another bioinformatics task with Perl, and learning how to use the bioperl database to search for the available programs.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001373	Simulation	3	3	0	151001250

Course Description

System modeling and simulation, Discrete and Continuous Markov Chains, Queuing Theory, Discrete Event Simulation, Large Sample Estimation, Output Statistics, Test of Randomness, Monté Carlo Simulation, sequence of assignments using some simulation tools such as ARENA..

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001341	Operation research	3	3	0	110101408

Course description

The Linear programming models, Simplex & revised simplex algorithms, Duality and sensitivity analysis in LP , Transportation and assignment problems, Decision Trees , Integer programming models , and the applications of the operations research.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001432	Compilers	3	3	0	151001250 أو 151001240

Course Description

Compiling topics, lexical analysis, symbol tables, parsing, syntax-directed translation, phases of the compiler, functions of the compiler phases, type-checking, run-time organization, intermediate code generation, code optimization.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001416	Programming languages Design	3	3	0	151001370

Course Description

Fundamental concepts and general principles underlying current programming languages and models, control and data abstractions, language processing and static and dynamic binding, indeterminacy and delayed evaluation, and languages and models for parallel and distributed processing. A variety of computational paradigms such as: functional programming, logic programming, object-oriented programming and data flow programming.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001474	Computer Graphics	3	3	0	151001250

Course Description

Hardware and software principles of interactive raster graphics. Introduction to the basic concepts, 2-D and 3-D modeling and transformations, viewing transformations, projections, rendering techniques, graphical software packages and graphics systems. Students will use a standard computer graphics API to reinforce concepts and study fundamental computer graphics algorithms.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001490	Graduation Project (1)	1	1	0	Complete 80 Hours

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001491	Graduation Project (2)	2	0	4	151001490

Course Description

There are no formal lectures for this course but the student holds discussion at least 3 hours a week with the supervisor. The student will be given assigned a practical project where he/she is expected to analyses, design and implement it and finally to write a report of very high quality.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001492	Special Topics In computer science	3	3	0	Complete 80 Hours

Course Description

Covers topics of interest in computer science at the senior undergraduate level. Content varies from semester to semester. Prerequisites: Consent of instructor.

Number	Name	Hours	Theoretical	Practical	Prerequisite
151001480	Practical Training	0	0	0	Complete 80 Hours

Course Description

A student has to finish 8 weeks of traning inside or outside Jordan, he has to work 40 hours a week. Before the student starts his training, he has to get a confermation from his departoment. Student can't do his training without finishing an 80 cridet hours.