جامعة عمان العربية
AMMAN ARAB UNIVERSITY

College of Information Technology

Computer Science Department

B.A Study Plan

Computer Science

Academic Year 2025/2026

Study Plan Credit hours (132)   Type of Program: **Blended/ Online**

Major Type: ☐Humanities ■ Scientific/Technical ☐Science Medical

Teaching Type	Percentage of study plan hours/number	Actual Ratio
Complete Online E-Learning	20% - 10% Maximum	20%
Blended learning (for scientific majors)	50% - 30% Maximum	%49
Face-to-face learning (for scientific majors)	30% Minimum	%31

Note: The learning types of the courses are disseminated at all academic levels in the program

Department Vision

Excellence in teaching, learning, scientific research, and community service in computer science at the local and regional levels, and international levels.

Department Mission

Preparing qualified and competitive student competencies in computer science who possess the knowledge, applied, and research skills to meet the labor market requirements and local community institutions' needs by regional and international quality standards.

Program Mission

Preparing graduates with deep knowledge in computer science by providing an appropriate environment to achieve excellence in teaching and learning, who have a local, regional, and international presence, and who have the motivation for continuous learning and the ability to keep up with developments.

Educational Program Objectives

1. Acquire the necessary theoretical and applied skills and knowledge in computer science.
2. Equip themselves with professional competencies and practice their profession with confidence and the ability to compete locally and regionally.
3. Continue learning and professional development amidst technological changes.
4. Work effectively within work teams while assuming ethical and professional responsibilities and understanding society's needs.

Educational Program Outcomes

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

1.1 (Knowledge): Define principles of computing and other relevant disciplines to identify solutions

1.2 (Skill): Analyze complex computing problems and apply principles of computing and other relevant disciplines to identify solutions.

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

(3) (Skill) Communicate effectively in various professional contexts.

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

4.1 (Knowledge): State professional responsibilities, ethical theories, legal and social issues.

4.2 (Skill): Employ computing practices based on legal and ethical principles.

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

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

6.1 (Knowledge): Define software development and computer-based solutions lifecycles to satisfy stakeholders' needs and requirements.

6.2 (Skill): Evaluate techniques and tools for computing-based solutions to problems.

6.3 (Competency): Apply theory, techniques, and tools for software development and computer-based solutions.

Plan Contents

The study plan for a bachelor's degree consists of a major in Computer Science of (132) credit hours disseminated as follows:

Sequence	Classification	Credit Hours	Percent %
1st	University Requirements	27	20%
2nd	College Requirements	18	14%
3rd	Program Requirements	87	66%
4th	Free subjects	-	-
Total		132	100%

Coding System Approved by the University

College Code	Major Code	Knowledge domain	Course Level	Sequence
4	07		year / Semester	
Faculty of Information Technology	**07** Computer Science			

Knowledge Domain

Domain Code	Knowledge Domain	Credited Hours of Study Plan
01	**Computer Science and Algorithms:** Discrete mathematics, Data structures, Algorithms Design and Analysis.	9
02	**Programming:** Introduction to Programming, Object-oriented programming, Visual programming, Web Application Programming	12
03	**Main Computer Components:** Digital Logic Design, Computer Organization and Architecture, Operating Systems.	9
04	**Computer Science courses**: Computer Networks, Information Security, Fundamentals of Software Engineering, Systems Analysis and Design, Databases, Theory of Computation	18
05	**Supporting Knowledge Areas:** Calculus (1), Linear Algebra ,Numerical Analysis, Principles of statistics and probability.	12
06	**Elective courses:** Minimum 9 credit hours.	9
07	**Field training:** 3 hours after passing a minimum of 80 credit hours.	3
08	**Graduation Project 1:** 1credit hours after passing 90 credit hours. **Graduation Project 2:** 2 credit hours after passing Graduation Project 1	4

First: University Requirements: (27) Credit Hours

A. **Compulsory Requirements:** (18)Credit Hours

Teaching type			Course Number	Course Title	Credited Hours	Pre-Requisite
Online E-Learning	Blended	Face-to-Face				
√			50511111	Remedial Course in Arabic	0	-
√			50511112	Remedial Course in English	0	-
√			50511113	Remedial Course in Computer Science	0	-
√			50511104	Communication Skills -Arabic Language (1)	3	50511111
√			50511105	Communication Skills English Language (1)	3	50511112
√			50511206	National Education	3	-
√			50511308	Military Sciences	3	-
√			50511305	Innovation and Entrepreneurship	3	-
√			50511205	Life Skills and Community Responsibility	3	-
√			50541209	Volunteer Work and Community Development	0	-
			Total		18	

B. **Elective Requirements**: (9) Credit Hours **from the following list:**

Teaching type			Course Number	Course Title	Credited Hours	Pre-Requisite
Online E-Learning	Blended	Face-to-Face				
√			50541103	Computer Skills	3	50511113
√			50541309	Digital Culture	3	50511113
√			50521106	Communication Skills -Arabic Language (2)	3	50511104
√			50521107	Communication Skills English Language (2)	3	50511105
√			50521203	Principles of Psychology	3	–
√			50521204	Human Rights	3	–
√			50531101	Islamic Culture	3	–

√			50531205	History of Quds and Hashemite Guardianship	3	–
√			50541204	Environment and development	3	–
√			50541206	Health and Community	3	–
√			50541308	Foreign Language	3	–
√			50541211	Introduction to Artificial Intelligence	3	-
√			50541208	Introduction to Sustainable Development	3	-
			Total		9	

C. **Remedial course:** (9) Credit Hours

Teaching type			Course Number	Course Title	Credited Hours	Pre-Requisite
Online E-Learning	Blended	Face-to-Face				
√			50511111	Remedial Course in Arabic	3	-
√			50511112	Remedial Course in English	3	-
√			50511113	Remedial Course in Computer Science	3	-
			Total		9	

Second: College Compulsory Requirements: (18) Credit Hours

Teaching type			Course Number	Course Title	Credited Hours*	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
	√		40741101	Fundamentals of Information Technology	3	3	0	–
	√		40722101	Websites Design	3	3	0	40741101
		√	40711201	Discrete Mathematics	3	3	0	40742202 (co
	√		50221101	Calculus (I)	3	3	0	
	√		40733203	Operating Systems	3	3	0	40712102
		√	40713104	Algorithms Design and Analysis	3	3	0	40712102
			Total		18	18	0	

*** Credit Hours**

Third: Program Requirements (87) Credit Hours

A. Compulsory Requirements: (72) Credit Hours

Teaching type			Course Number	Course Title	Credited Hours*	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
		√	40721101	Introduction to Programming	3	3	0	
		√	40721102	Laboratory of Introduction to Programming	1	0	2	40721101 (co)
		√	40712102	Data Structures	3	3	0	40712102
		√	40712103	Laboratory of Data Structures	1	0	2	40712102 (co)
		√	40742202	Databases	3	3	0	40712102
		√	40742203	Laboratory of Databases	1	0	2	40742202 (co
	√		40742210	English Language for Information Technology	1	1	0	
		√	40721203	Object Oriented Programming	3	3	0	40721101
		√	40721204	Laboratory of Object Oriented Programming	1	0	2	40721203 (co)
	√		40744208	Information Security	3	3	0	40742202
	√		40743107	Systems Analysis and Design	3	2	2	40352201
	√		40732101	Digital Logic Design	3	3	0	40711201
	√		40732202	Computer Organization and Architecture	3	3	0	40732101
		√	40352201	Fundamentals of Software Engineering	3	3	0	40721203
	√		40722106	Visual Programming	3	2	2	40742202
		√	40722204	Advanced Programming	3	3	0	40721203
		√	40722205	Programming of Internet Applications	3	3	0	40722101 + 40742202 (co)
		√	40743204	Computer Networks	3	3	0	40741101
	√		50551101	General Physics (1)	3	3	0	

		√	50551102	Laboratory of General Physics (1)	1	0	2	50551101 (co)
	√		50223111	Numerical Analysis (1)	3	3	0	50221101
		√	40743101	Theory of Computation	3	3	0	40711201
	√		40632201	Fundamentals of Artificial Intelligence	3	3	0	40713104
		√	40743201	Compiler Design	3	3	0	40743101
	√		40742105	Computer Ethics	2	2	0	40741101
	√		40744202	Parallel and Distributed Computer Systems	3	2	2	40733203
	√		40774101	Field Training of Computer Science	3	0	3	Complete 80 CH
	√		40784100	Applied Graduation Project (1)	2	0	2	Complete 90 CH
	√		40784201	Applied Graduation Project (2)	2	0	2	40784100
			Total		72	60	17	

*** Credit Hours**

B. Elective Requirements: (9) Credit Hours

Teaching type			Course Number	Course Title	Credited Hours*	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
	√		40763201	Special Topics	3	3	0	Complete 60 CH
	√		40764102	Mobile applications design and development	3	3	0	40722106
	√		40764202	Fundamentals of multimedia	3	3	0	40721203
	√		40764203	Network programming	3	3	0	40743204
	√		40764204	Digital image processing	3	2	2	40721203
	√		40764206	Network Security	3	3	0	40743204
	√		40764207	Database Management Systems	3	3	0	40742202
	√		40763202	Emerging Topics	3	3	0	Complete 60 CH
			Total		9	9	0	

*** Credit Hours**

C. **Ancillary Courses** (6) Credit Hours:

Teaching type	Course	Course Title	Credited	Theoretical	Practical	Pre-

Online E-Learning	Blended	Face-to-Face	Number		Hours*			Requisite
	√		50531100	Principle of Statistics and Probability	3	3	0	
	√		50212104	Linear Algebra (1)	3	3	0	50221101
			Total		**6**	**6**	**0**	

*** Credit Hours**

Guidance plan

First Year

First Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40741101	Fundamentals of Information Technology	Blended	3		
50551101	General Physics (1)	Blended	3		
50551102	Laboratory of General Physics (1)	Face-to-Face	1		50551101
40721101	Introduction to Programming	Face-to-Face	3		
40721102	Laboratory of Introduction to Programming	Face-to-Face	1		40721101
50221101	Calculus (1)	Blended	3		
	University Core Requirement	Online E-Learning	3		
Total			17		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40711201	Discrete Mathematics	Face-to-Face	3	50221101	
40721203	Object Oriented Programming	Face-to-Face	3	40721101	
40721204	Laboratory of Object Oriented Programming	Face-to-Face	1		40721203
40722101	Websites Design	Blended	3	40741101	
40743204	Computer Networks	Face-to-Face	3	40741101	

	University Elective Requirement	Online E-Learning	3		
Total			16		

*** Credit Hours**

Second Year

First Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40712102	Data Structures	Face-to-Face	3	40721203	
40712103	Laboratory of Data Structures	Face-to-Face	1		40712102
40732101	Digital Logic Design	Blended	3	40711201	
40742105	Computer Ethics	Blended	2	40741101	
40352201	Fundamentals of Software Engineering	Face-to-Face	3	40721203	
	University Core Requirement	Online E-Learning	3		
Total			15		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40732202	Computer Organization and Architecture	Blended	3	40732101	
40742202	Databases	Face-to-Face	3	40712102	
40742203	Laboratory of Databases	Face-to-Face	1		40742202
40722205	Programming of Internet Applications	Face-to-Face	3	40722101	40742202
40743107	Systems Analysis and Design	Blended	3	40352201	
40742210	English Language for Information Technology	Blended	1		
50531100	Principle of Statistics and Probability	Blended	3		
Total			17		

*** Credit Hours**

Third Year

First Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40713104	Algorithms Design and Analysis	Face-to-Face	3	40712102	
40743101	Theory of Computation	Face-to-Face	3	40711201	
50212104	Linear Algebra (1)	Blended	3	50221101	
40722204	Advanced Programming	Face-to-Face	3	40721203	
40722106	Visual Programming	Blended	3	40742202	
	University Elective Requirement	Online E-Learning	3		
Total			18		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40632201	Fundamentals of Artificial Intelligence	Blended	3	40713104	
40733203	Operating Systems	Blended	3	40712102	
40743201	Compiler Design	Face-to-Face	3	40743101	
50223111	Numerical Analysis	Blended	3	50221101	
	University Core Requirement	Online E-Learning	3		
	University Core Requirement	Online E-Learning	3		
Total			18		

*** Credit Hours**

Fourth Year

First Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40744208	Information Security	Blended	3	40742202	
40774101	Field Training of Computer Science	Blended	3	Complete 80 CH	
40784100	Applied Graduation Project (1)	Blended	2	Complete 90 CH	
	University Core Requirement	Online E-Learning	3		
	University Elective Requirement	Online E-Learning	3		
	Program Elective Requirement	Blended	3		
Total			17		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40744202	Parallel and Distributed Computer Systems	Blended	3	40733203	
40784201	Applied Graduation Project (2)	Blended	2	40784100	
	Program Elective Requirement	Blended	3		
	Program Elective Requirement	Blended	3		
	University Core Requirement	Online E-Learning	3		
Total			14		

*** Credit Hours**

Courses Tree

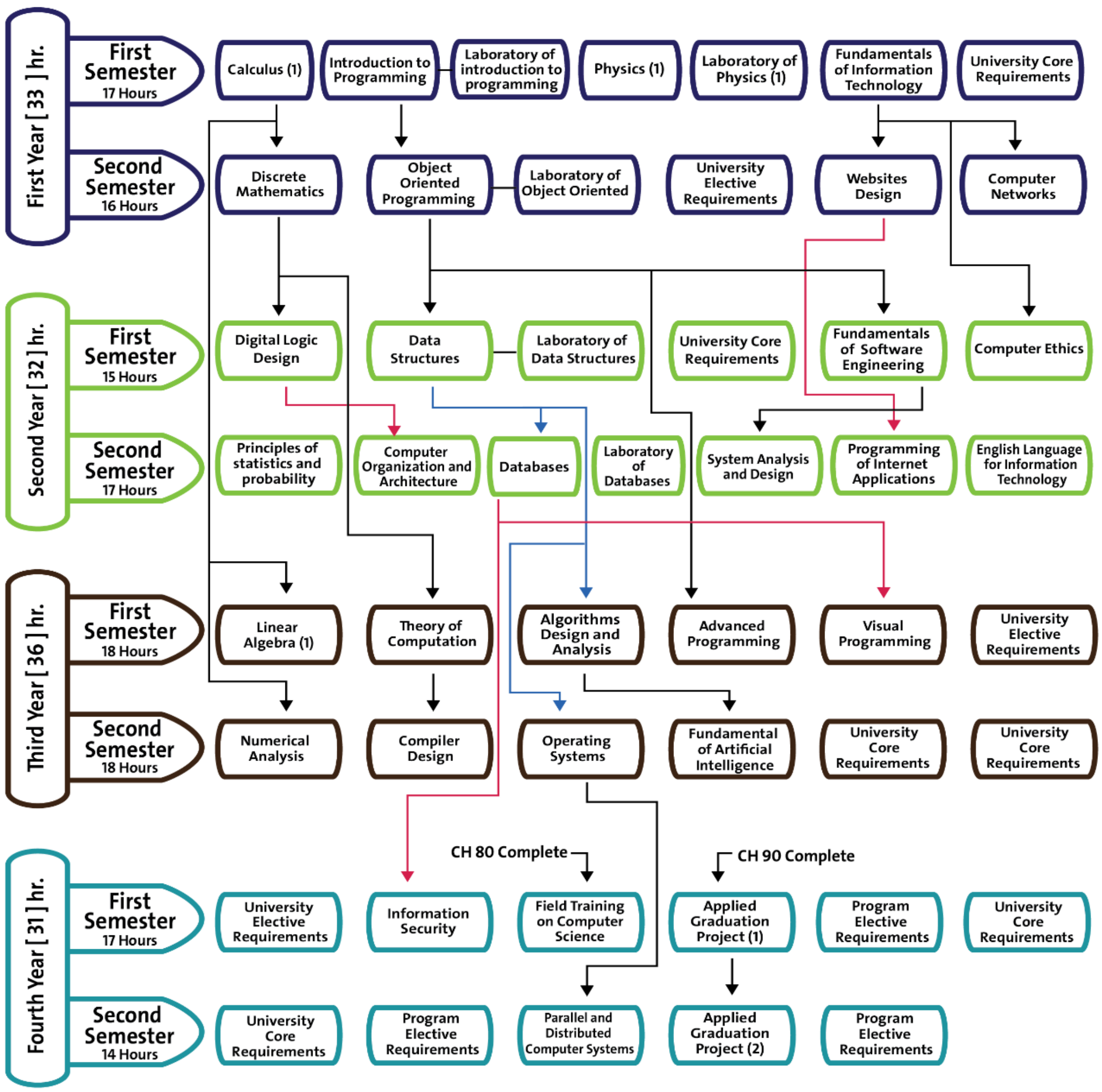
جامعة عمان العربية AMMAN ARAB UNIVERSITY

كلية تكنولوجيا المعلومات College of Information Technology

Courses Tree

College: College of Information Technology | **Department: Computer Science**

Major: : Computer Science | **Program: Bachelor** | **v.04** | **Issue Date: 1/8/2025**



F566-1, Rev. a
Ref.: Quality Assurance Council Session (08/2021-2022), Decision No.:01, Date:21/05/2022

Course Description

40721101, Introduction to Programming, (3) Credit Hours, Prerequisite: -, Face-to-Face
This course introduces the fundamental concepts of programming using selected language. It covers basic structures of programming concepts such as variables, data types, control structures, arrays, functions, and pointers. Students will apply their gained knowledge in a series of assignments. Practical work for three hours weekly is included, the course includes complete a practical project by the students.

40721102, Laboratory of Introduction to Programming, (1) Credit Hours, Corequisite: Introduction to Programming 40721101, Face-to-Face
A practical laboratory in programming using selected language, where it covers practical exercises in the basics of programming such as variables, data types, control statements, matrices, functions and indicators. In this course, students apply their knowledge through a series of practical assignments in the laboratory.

40741101, Fundamentals of Information Technology, (3) Credit Hours, Prerequisite: -, Blended
Knowledge of the terminology, information systems environment, processes, and components associated with information technology, information systems concepts, components, tools, and applications. It will provide an introductory understanding of computer hardware, numbering system and knowledge of how data is prepared for computer, instruction processed at a basic machine level, and software (operating systems, database, and web development and applications). It also introduces the networking, Internet, and the basics of the information security, web searching, in addition to algorithms and problem solving,

40721203, Object Oriented Programming, (3) Credit Hours, Prerequisite: 40721101 Introduction to Programming, Face-to-Face
Object-oriented concepts (encapsulation, data abstraction, inheritance, and polymorphism) along with OO design using UML (unified modeling language). The OOP concepts covered using C++ programming language. The course emphasizes on the concepts of classes, templates, friend classes, inheritance, abstract class and virtual functions, exceptions, and generic programming. Upon completion, students should be able to use an object-oriented language to develop rather complex programs, the course includes complete a practical project by the students.

40721204, Laboratory of Object Oriented Programming, (1) Credit Hours, Corequisite: Object Oriented Programming 40721203 Face-to-Face
A practical laboratory in object-oriented programming, covering practical exercises in object-oriented programming (encapsulation, data abstraction, inheritance, polymorphism). The course is concerned with applying concepts of classes (classes and templates, friendly classes, inheritance, abstract layer and virtual functions, exceptions and general programming in a practical way). Students will apply their knowledge through a series of practical assignments in the laboratory.

40711201, Discrete Mathematics, (3) Credit Hours, Prerequisite: 50221101 Calculus (1), Face-to-Face
Fundamental aspects of discrete mathematics used in computer science starting with propositions, logical operations, truth tables, set theory, relations and functions, and methods of proofs. The course also introduces

the concepts of sequences, matrices, lattices, graph theory, and trees (rooted tree, subtree). the course includes complete a practical project by the students.

40712102, Data Structures, (3) Credit Hours, Prerequisite: 40721203 Object Oriented Programming, Face-to-Face

Basic concepts of data structure and algorithm. The topics that will be covered in this course concerning Data type and structures; Abstract data types and encapsulation; Stacks; Queues; Recursion; Linked Lists; Binary trees; General trees; File organization: sequential and indexed files; Graphs: representation, traversing, shortest path; Sorting: exchange, insertion, quick sort, heap and others; Searching. At the end of this course, students will be able to select the proper data structure and algorithm to solve a specific software problem, the course includes complete a practical project by the students.

40712103, Laboratory of Data Structures, (1) Credit Hours, Corequisite: Data Structures, 40712102, Face-to-Face

A practical laboratory in data structures, covering practical exercises including abstract data types and encapsulation; Stacks; Queues; Recursion; Linked Lists; Binary trees, general trees, File organization, Graphs, Sorting and Searching. The course includes complete a practical project or research by the students.

40722101, Websites Design, (3) Credit Hours, Prerequisite: 40741101 Fundamentals of Information Technology, Blended

Basic concepts of the World Wide Web, internet technology, current Web protocols, and client-server programming for desktop computers and smart phones. Students will learn standard Hypertext Markup Language (HTML) for create the web pages, basics of Cascading Style Sheets (CSS) for design and layout the web pages, as well as JavaScript, together with XML and JSON for data-interchange and Ajax technology for building rich internet applications for desktop computers and smart phones. Students will apply their gained knowledge in a series of practical assignments. At the end of this course, students will create and maintain a small web page project on a live web server for desktop computers and mobile devices, the course includes complete a practical project by the students.

40742202, Databases, (3) Credit Hours, Prerequisite: 40712102 Data Structures, Face-to-Face

Basic concepts of databases and the main topics such as: database definition, database system; overview of database management, database system architecture, introduction to relational model, database algebra, database design, database integrity, an introduction to structured query language (SQL), mapping between ER- and EER-to-Relational, the course includes complete a practical project by the students.

40742203, Laboratory of Database, (1) Credit Hours, Corequisite: Databases 40742202, Face-to-Face

A practical laboratory in databases, covering practical exercises in database system and database management (relational database systems RDBMS, structured query language (SQL), and schema design techniques), the course includes complete a practical project or research by the students.

40722106, Visual Programming, (3) Credit Hours, Prerequisite: 40742202**, Databases, Blended**

Fundamental concepts of visual programming (VP). Student will learn about VP concepts, event driven, and how to use VP to construct graphical user interface using Visual Basic.NET (C#.NET). This course covers an introduction to programming concepts and methods including the problem analysis and problem-solving techniques. Also, Data types, control structures, functions, syntax and semantics of the language, classes, class relationships, and exception handling will be covered. Connect to database could be covered, the course includes complete a practical project by the students.

40713104, Algorithms Design and Analysis, (3) Credit Hours, Prerequisite: 40712102 Data Structures, Face-to-Face

Basic concepts of designing and analyzing algorithms. Topics covered: review of abstract data types and data structures, definition of algorithms, classifying functions and computational complexities of algorithms, algorithms analysis & design techniques including: divide and conquer greedy methods, searching and sorting, trees, graphs, hashing, combinatorial algorithms and P/NP problems, the course includes complete a practical project or research by the students.

40733203, Operating System, (3) Credit Hours, Prerequisite: 40712102 Data Structures, Blended

The definition and role of the operating systems. Topics spanned functionality and structuring methods of a typical operating system; Introduction to modern operating systems, including device control, interrupts, synchronization and inter-process communication, process scheduling, memory management and virtual memory, disk management, and security, the course includes complete a practical project by the students.

40722205, Programming of Internet Applications, (3) Credit Hours, Prerequisite: 40722101 Websites Design, Co-requisite :40742202 Databases, Face-to-Face

The knowledge and the tools to design and implement internet web applications for desktop computers and smartphones using PHP language as a server-side language. Initially, the course will introduce HTML language and web applications. Students will learn about concepts of PHP, functionality of web server, install and configure Apache HTTP server or Microsoft IIS. This course goes over the syntax and usage of PHP language such as data types, operators, arrays, control statements, expressions, sessions, cookies, as well as create programs that interact with MySQL databases. At the end of this course, students will create and maintain a small web application project on a live web server for desktop computers and smartphones, the course includes complete a practical project by the students.

40722204, Advanced Programming, (3) Credit Hours, Prerequisite: 40721203 Object Oriented Programming, Face-to-Face

Advanced Programming with Python introduces students to concepts in programming with Python. It assumes basic knowledge of Python control structures, functions, files, data structures, and the numpy library. The course will cover collecting data from various sources including web scraping, Web API's, CSV and other structured data files, and databases; classifying data using the panda's library for data analysis; regular expressions and other string manipulation methods; classes and object-oriented programming; and building real-world software applications, the course includes complete a practical project by the students.

40352201, Fundamentals of Software Engineering, (3) Credit Hours, Prerequisite: 40721203 Object Oriented Programming, Face-to-Face

This course develops a knowledge of the Information Systems environment and develops a strong foundation by covering topics including Planning, requirements, analysis and specification, design; testing; debugging; maintenance; and documentation. It includes complete a practical project or research by the students.

40744208, Information Security, (3) Credit Hours, Prerequisite: 40742202 Database, Blended

Information systems security and contemporary issues in information security and confidentiality problems, confidentiality models, methods to reduce risks and losses, information systems security within organizations, cryptography, information security control, information security programs, safe and reliable systems, user identification, network security case study. As you search on computer virus topics and methods of prevention.

40732101, Digital Logic Design, (3) Credit Hours, Prerequisite: 40711201 Discrete Mathematics, Blended

Introductory knowledge and basic concept to Boolean logic and combinational circuits. Analysis of switching devices, minimization techniques, number systems and codes and logic design of functional digital units are also included. Furthermore, the use of LSI in logic design, an introduction to sequential circuits design of synchronous, asynchronous, and pulse sequential circuits, minimization of sequential circuits and state assignment are involved.

40732202, Computer Organization and Architecture, (3) Credit Hours, Prerequisite: 40732101 Digital Logic Design, Blended

Principles of computer organization and architecture concepts covers the following topics: computer system hardware organization and architecture; instruction set architectures; addressing modes; register transfer notation; processor design and computer arithmetic; memory systems; hardware implementations of virtual memory, and input/output control and devices.

40742209, English Language for Information Technology, (1) Credit Hours, Prerequisite: -, Blended

This course is designed to develop students professional English communication skills within the context of the IT industry. It focuses on key technical vocabulary, grammar, and communication strategies used in common workplace scenarios such as giving presentations, writing emails and reports, troubleshooting IT problems, working with software/hardware, and managing online services such as websites, databases, and e-commerce systems.

50221101, Calculus (1), (3) Credit Hours, Prerequisite: -, Blended

Introduction to functions, limits and continuity, derivatives and rules, techniques of differentiation. It also introduces also the science of statistics and statistical research methods, sampling and sample data collection and classification. It covers various topics in descriptive statistics, correlation and regression analysis, time series, index numbers, the course includes complete a practical project or research by the students.

50212104, Linear Algebra (1), (3) Credit Hours, Prerequisite: 50221101 Calculus (1), Blended

Matrices and matrix operations, transpose and inverse of a matrix, determinants and their properties, vector spaces and subspaces, linearly independent and linearly dependent, row space and column space, null space of a matrix, inner product space, system of linear equations, methods of solving system of linear equations.

50531100, Principle of Statistics and Probability, (3) Credit Hours, Blended

Describing Statistical Data by tables, graphs and numerical Measures, Measures of Central Tendency and Deviation, counting methods, The Variance, binomial and Normal distribution, probabilities Laws, Random Variables, Sampling distributions, testing of statistical hypotheses for two populations, correlation and regression, correlation coefficient.

50223111, Numerical Analysis (1), (3) Credit Hours, Prerequisite: 50221101 Calculus (1), Blended

Introduction to the numerical analysis, and its primary objective is to develop the basic understanding of numerical algorithms and required skills to implement algorithms to solve mathematical problems, the course includes complete a practical project or research by the students.

50551101, General Physics (1), (3) Credit Hours, Prerequisite: -, Blended

Motion in One Dimension, Vectors, Motion in Two Dimensions, The Laws of Motion, Circular Motion and Other applications of Newton's Laws, Work and Kinetic Energy, Potential Energy and Conservation of Energy, Linear Momentum and Collisions, Rotation of a Rigid Object About a Fixed Axis, Rolling Motion and Angular Momentum.

50551102, General Physics laboratory (1), (3) Credit Hours, Prerequisite: 50551101 (Co)

A practical laboratory in The Laws of Motion, Circular Motion and Other applications of Newton's Laws, Work and Kinetic Energy, Potential Energy and Conservation of Energy, Linear Momentum and Collisions, Rotation of a Rigid Object About a Fixed Axis, Rolling Motion and Angular Momentum.

40743204, Computer Networks, (3) Credit Hours, Prerequisite: 40741101 Fundamentals of Information Technology, Face-to-Face

Key Concepts of Computer Networks; Broad Range of Topics in Networking (e.g. Networks Applications, Network Classifications and Topologies, Network Layers, Channel Performance Measures, Transmission Media, Communication Network Protocols and Architecture); Data Link Layer (e.g. Framing, Error Detection and Correction, CSMA/CD, LAN IEEE Standards); Network Layer (e.g. IP service model, IP Addressing, Sub-netting, Host Configuration DHCP, ARP Protocol, ICMP protocol); Transport Layer (e.g. UDP Protocol, TCP Protocol, TCP Reliable Transfer and Sliding Window, TCP Flow and Congestion Control); Application Layer (e.g. DNS Protocol, NAT Protocol, HTTP Protocol, Persistent and Non-Persistent HTTP Connection) , the course includes complete a practical project or research by the students.

40743107, Systems Analysis and Design, (3) Credit Hours, Prerequisite: 40352201 Fundamentals of Software Engineering, Blended

Main concepts of the system development life cycle. Information gathering and reporting activities from the analysis phase through the maintenance and support phase will be covered. At the end of this course, students will be able to design, implement, and document the system development cycle. The main topics that will be covered are: introduction to systems development; development life cycle; system development feasibility;

development of fact finding methods; context diagram; data flow diagram; decision tables and trees; data dictionary; installation; training; development tools: documentation, maintenance, conceptual design, DB design, reverse engineering, graphical user interface, systems life cycle, system conversion, system charts and flow of control. Case studies are used to emphasize the points covered, the course includes complete a practical project or research by the students.

40632201, Fundamentals of Artificial Intelligence, (3) Credit Hours, Prerequisite: 40713104 Algorithm Design and Analysis, Blended

The basic principles of artificial intelligence and its fields. The course shows how to build a software system that behaves intelligently. Topics concerning introduction to AI and application, exhaustive search methods, heuristic search methods, the basic knowledge representation, problem solving, and learning methods of artificial intelligence will be covered. At the end of this course, students should be able to understand the role of knowledge representation, problem solving, machine learning, and pattern recognition, The course includes a complete practical project or research done by students.

40743101, Theory of Computation, (3) Credit Hours, Prerequisite: 40711201 Discrete Mathematics, Face-to-Face

The purpose of this course is to provide an overview of fundamental ideas in computation theory. It will cover various topics including automata theory, deterministic and nondeterministic finite automata, regular expressions, properties of regular languages, context-free grammars, properties of context-free languages, pushdown automata, an introduction to Turing machines, as well as undesirability and intractable problems.

40743201, Compiler Design, (3) Credit Hours, Prerequisite: 40743101 Theory of Computation, Face-to-Face

The principles and techniques of designing and implementing compilers. In this course, students will gain a comprehensive understanding of the techniques and concepts used in various stages of the compilation process. The course covers topics such as lexical analysis, syntax analysis, both top-down and bottom-up parsing, semantic analysis, the synthesis stage of compilation, storage allocation, and code generation.

40742105, Computer Ethics, (2) Credit Hours, Prerequisite: 40741101 Fundamentals of information Technology, Blended

In this course, students will be introduced to the subject of ethics in information technology, which encompasses a range of topics. These include defining computer ethics, understanding rules and policies, exploring concepts such as hacking and viruses, delving into the realm of Internet ethics, examining issues related to freedom of expression on the Internet, considering the social responsibilities of computer professionals, exploring software copyright and intellectual property, discussing software piracy, analyzing cyber law, and addressing the important aspects of privacy and security in the realm of computerized information.

40744202, Parallel and Distributed Computer Systems, (3) Credit Hours, Prerequisite: 40733203 Operating Systems, Blended

The principles and techniques of designing, implementing, and utilizing parallel and distributed computing systems. Students will learn about parallel architectures, algorithms, programming models, distributed systems, and interposes communication. The course emphasizes topics such as synchronization, load balancing, fault tolerance, and distributed file systems. Through practical assignments and projects, students will gain hands-on experience in programming and analyzing parallel and distributed algorithms, as well as exploring real-world applications and emerging trends in the field. By the end of the course, students will be equipped with the necessary knowledge and skills to develop efficient and scalable solutions for computationally intensive and large-scale problems in diverse domains.

40774101, Field Training of Computer Science, (3) Credit Hours, Prerequisite: Complete 80 Credit Hours, Blended

Training is required for each student in one of the organizations for not less than six weeks, and 90 hours of training, the practice regulations are according to the training regulations issued and approved by the department, college and dean's council of the university, the course includes complete a practical project or research by the students.

40784100, Applied Graduation Project (1), (2) Credit Hours, Prerequisite: Complete 90 Credit Hours, Blended

Project includes theoretical and practical aspects related to the design and analysis of recent applications in Computer Science, applied research-oriented, technical report, and presentation.

40784201, Applied Graduation Project (2), (2) Credit Hours, Prerequisite: Applied Graduation Project (1) 40784100, Blended

Project includes theoretical and practical aspects related to the implementation and visualization of recent applications in Computer Science, applied research-oriented, technical report, and presentation.

40763201, Special Topics, (3) Credit Hours, Prerequisite: Complete 60 CH, Blended

Special topics of current trends in Computer Science, the course includes complete a practical project or research by the students.

40764102, Mobile applications design and development, (3) Credit Hours, Prerequisite: 40722106, Visual Programming, Blended

The knowledge and skills required to create mobile applications for various platforms. Students will learn about topics such as mobile user interface design, app development frameworks (including iOS and Android), app architecture, data storage and synchronization, app security, and performance optimization. The course emphasizes designing user-friendly interfaces, utilizing popular development frameworks, implementing effective data storage and synchronization methods, and ensuring app security through secure data transmission and authentication. Students will also explore techniques for optimizing app performance by considering factors like memory usage, battery consumption, and network efficiency. Through practical projects and assignments, students will gain hands-on experience in developing mobile applications that adhere to best practices and industry standards.

40764204, Digital image processing, (3) Credit Hours, Prerequisite: 40721203 Object Oriented Programming, Blended

This course introduces fundamental principles in digital image processing. It covers a range of topics, including image formation through sampling and quantization, various types of image resolution (spatial, grayscale, and color), and techniques for enhancing images in the spatial domain. Spatial domain enhancement covers point-to-point enhancement methods such as stretching, slicing, and thresholding, as well as area-to-point enhancement methods like smoothing, sharpening, and noise reduction. The course also explores enhancement techniques in the frequency domain, including sharpening and smoothing using the Fast Fourier Transform (FFT) theory in both one and two dimensions, in both continuous and discrete forms. Other topics covered include image restoration, image analysis, line detection, edge detection, segmentation techniques such as thresholding, splitting and merging, and region growing. Additionally, the course introduces image encoding methods such as Huffman and Run-length encoding, the course includes complete a practical project or research by the students.

40764202, Fundamentals of multimedia, (3) Credit Hours, Prerequisite: 40721203 Object Oriented Programming, Blended

The principles and techniques involved in multimedia systems and applications. Topics covered include multimedia data representation, compression algorithms, coding standards, networking, synchronization, and applications. Students will explore various multimedia data formats, such as images, audio, and video, and learn about compression techniques to efficiently store and transmit multimedia content. The course also addresses multimedia coding standards and protocols, enabling students to understand industry practices and standards. Through practical assignments and projects, students will gain hands-on experience in developing multimedia applications and applying techniques like data processing, compression, and networking. By the end of the course, students will have a solid understanding of multimedia fundamentals and the ability to design and develop multimedia systems and applications.

40764203, Network programming, (3) Credit Hours, Lecture: 3, Prerequisite: 40743204 Computer Networks, Blended

The course introduces the basic concepts of how to design, develop, and troubleshoot network applications using socket programming. They will also learn how clients and servers communicate with each other using socket programming. Topics covered include TCP/IP protocols and stacks, network programming, sockets, port numbers, protocol numbers, socket scope, socket functions, socket system calls, client-side programming, server-side programming, and socket debugging techniques. The course includes a full-time project or research to be completed by students, the course includes complete a practical project by the students.

40764206, Network Security, (3) Credit Hours, Prerequisite: 40743204 Computer Networks, Blended

This course discusses analytical and practical capabilities for computer networks' design, deployment, management and security. Basic foundations of network management, the Simple Network Management Protocol in its different versions (SNMPv1, SNMPv2, and SNMPv3), Remote network Monitoring. In addition, it focuses on Telecommunications Management Network, management tools and statistics measurement, management applications including: configuration, performance, event correlation, security, reports and service levels, the course includes complete a practical project or research by the students.

40764207 Database Management Systems (3) Credit Hours, Prerequisite: 40742202 Databases, Blended

The principles, design, implementation, architecture and applications of DBMS; Advanced Structured Query Language (SQL) such as: views, exit, with, create type, authorization, metadata, dynamic SQL, triggers, recursion; data dictionary; Normalization processes: 1NF, 2NF, 3NF and BCNF; DB Security; Modern DBMSs: Object-Oriented DBMSs; Physical Database design; Centralized and distributed Database systems. Advanced databases topics: Storage and File Structure, Indexing and Hashing, Transactions, Concurrency Control, and UML, the course includes complete a practical project by the students.

40763202 Emerging Topics (3) Credit Hours, Prerequisite: 60 CH, Blended

This course aims to introduce students to the latest developments and trends in the field of computer science, with a focus on advanced topics that emerge as a result of rapid advances in technology and scientific research. The course covers selected topics that are constantly updated to reflect new innovations and challenges in the field, allowing students to gain in-depth knowledge of contemporary issues. The course covers the following topics: Artificial Intelligence and Machine Learning, Cloud and Edge Computing, Cybersecurity, Blockchain and Cryptocurrency Technologies, Quantum Computing, Internet of Things, Big Data Processing, and Human-Computer Interaction.