



Faculty of Computer Science and Informatics

Mobile Computing Department

**Study Plan of Bachelor's Degree in
Mobile Computing
Academic Year: 2021/2022**



Department Vision

An entrepreneurial department in the region in delivering graduates specialized in developing, maintaining, operating and managing applications for mobile devices.

Department Mission

Prepare qualified graduates in the field of Mobile Computing as an effort towards meeting the needs of the local and regional labor markets; capable of accomplishing distinguished projects; capable of helping infrastructure developments and promoting knowledge-based economy; and capable of developing and improving the performance of community organizations.

Department Objectives

1. Possess the necessary skills of theoretical and applied knowledge in the field of Mobile Computing.
2. Gain the professional competences and practice their profession with confidence locally and regionally.
3. Continue lifelong learning and professional development amid future technological changes.
4. Be active members of teamwork with professional and ethical responsibilities, and know the needs of the community.



Learning Outcomes

Graduates of the program will have an ability to:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. 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. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computing techniques in mobile-based solution development. [MC]



Contents of the Study Plan

The bachelor's degree program in Mobile Computing consists of 132 credit hours distributed as follows:

No	Requirement Type	Credited Hours	Percentage
First	University Requirements	27	20%
Second	College Requirements	23	17%
Third	Program Requirements	82	63%
Total		132	100%

University Coding System

4	0 4	-	Year Term	- -
College Code	Department Code	Knowledge Area	Course Level	Course Sequence
Faculty of Computer Science and Informatics	01 Masters in Computer Science 02 Computer Information System 03 Software Engineering 04 Mobile Computing 05 Cybersecurity			



Knowledge Areas

No	Knowledge Area	Credit Hours in the Study Plan
01	Computer Science and Algorithms: Discrete Mathematics, Data Structures, Algorithms.	6
02	Programming: Object Oriented Programming, Visual Programming, Web Application Programming	9
03	Applications and Information Science: Database, Database Management Systems, Systems Analysis and Design, Information Security, Networks and Data Transmission.	12
04	Courses in Mobile Computing: Mobile Web Design, Simulation and Modeling for Mobile Devices, Distributed Systems (Cloud Computing, Distributed Databases), General Applications for Mobile Devices, Human Computer Interaction.	21
05	Supporting Knowledge Areas: Statistics, Numerical Analysis, Linear Algebra.	6
06	Elective Courses: Several courses within the sub-field of the program.	9
-	Field training: 0 hours after passing a minimum of 80 credit hours.	3
-	Graduation Project: 3 credit hours after passing 90 credit hours.	3
-	Laboratories: Several laboratories covering the needs and number of students.	-



First: University Requirements: 27 Credit Hours

A. University Core: 15 Credit Hours

Code	Course Name	Credit Hours	Prerequisite
5051102	Arabic Language 1	3	5051108
5051103	English Language 1	3	5051109
5051108	Arabic Language Basics	0	
5051109	English Language Basics	0	
5051110	Computer Basics	0	
50511206	National Education	3	
50511308	Military Sciences	3	
50541103	Computer Skills	3	5051110
Total		15	

B. University Elective: choose 12 Credit Hours from the following courses

Code	Course Name	Credit Hours	Prerequisite
50511204	Life Skills	3	
50511306	Entrepreneurship and Innovation	3	
50521101	Arabic Language 2	3	5051102
50521102	English Language 2	3	5051103
50521203	Principles of Psychology	3	
50521204	Human Rights	3	
50531101	Islamic Culture	3	
50531205	Jerusalem and the Hashemite Guardianship	3	
50541203	Environment and Society	3	
50541206	Health and Society	3	
50541307	Communication and Internet	3	
50541308	Foreign Language	3	



Second: College Core Requirements: 23 Credit Hours

Code	Course Name	CH	Th	Lab	Prerequisite
40212101	Data Structures	3	3	0	40421211
40241101	Fundamentals of Information Technology	3	3	0	
40241202	Databases	3	3	0	40241101
40241203	Laboratory of Databases	1	0	3	40241202 (co)
40312101	Discrete Mathematics	3	3	0	50551105
40322101	Websites Design	3	3	0	40241101
40421108	Introduction to Programming	3	3	0	
40421109	Laboratory of Introduction to Programming	1	0	3	40421108 (co)
40264401	Communication and Writing Skills	3	3	0	
Total		23	21	6	

Third: Program Requirements: 82 Credit Hours

A. Program Core: 67 Credit Hours

Code	Course Name	CH	Th	Lab	Prerequisite
40421211	Object Oriented Programming	3	3	0	40421108
40421212	Laboratory of Object Oriented Programming	1	0	3	40421211 (co)
40213103	Algorithms Design and Analysis	3	3	0	40212101
40252201	Database Management Systems	3	3	0	40241202
40253205	Information Systems Security	3	3	0	40322202
40322202	Programming of Internet Applications	3	3	0	40241202 + 40322101
40322203	Visual Programming	3	3	0	40421211
40342101	Systems Analysis and Design	3	3	0	40241202
40354106	Human Computer Interaction	3	3	0	40322203
40422207	Advanced Programming	3	3	0	40421211
40433201	Computer Networks	3	3	0	40241101
40434103	Network Programing	3	3	0	40433201
40434205	Cloud Computing Systems	3	3	0	40433201
40442101	Wireless and Mobile Communication Technologies	3	3	0	
40442203	Mobile operating system	3	3	0	40212101
40442204	Integrative Programming and Technologies	3	3	0	40442104
40443105	Mobile Software Engineering	3	3	0	40342101
40443106	Mobile Devices Modeling and Simulation Methods	3	3	0	40213103
40442104	Mobile Application Programming (1)	3	3	0	40421211



Code	Course Name	CH	Th	Lab	Prerequisite
40444111	Multiplatform Mobile Application development	3	3	0	40442104
40444110	Programming Games for Smart Devices	3	3	0	40322203
40484101	Field Training on MC	3	3	0	Complete 90 CH
40494203	Applied Graduation Project (1)	1	1	0	Complete 90 CH
40494204	Applied Graduation Project (2)	2	2	0	40494203
Total		67	66	3	

B. Program Elective: 9 Credit Hours, choose from one of the following Tracks

Code	Course Name	CH	Th	Lab	Prerequisite
40444111	Mobile Application Programming (2)	3	3	0	40442104
40443112	Multimedia Technologies for Smart Devices	3	3	0	40322203
40444213	Special Topics in MC	3	3	0	Complete 60 CH
40443214	Smart Devices Organization and Architecture	3	3	0	40442203
40444215	Smart Devices Application Branding	3	3	0	40442104
40444216	Business & Marketing for Smart Devices	3	3	0	40443105
40444217	Smart Devices Network	3	3	0	40433201
40444218	UI/UX for Smart Devices	3	3	0	40443105

C. Support Courses: 6 Credit Hours

Code	Course Name	CH	Th	Lab	Prerequisite
50223121	Numerical Analysis	3	3	0	50551105
50551105	Principles of Mathematics and Statistics	3	3	0	
Total		6	6	0	



Advisory Plan

Year 1				
1 st Semester (Fall)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40441101	Principles of Mathematics and Statistics	3		
40421108	Introduction to Programming	3		
40421109	Laboratory of Introduction to Programming	1		40421108
40241101	Fundamentals of Information Technology	3		
	University Core Requirement	3		
	University Elective Requirement	3		
Total		16		

2 nd Semester (Spring)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
50223121	Numerical Analysis	3	50551105	
40312101	Discrete Mathematics	3	50551105	
40421211	Object Oriented Programming	3	40421108	
40421212	Laboratory of Object Oriented Programming	1		40421211
40241202	Databases	3	40241101	
40241203	Laboratory of Databases	1		40241202
40442101	Wireless and Mobile communication Technologies	3		
Total		17		



Year 2				
1 st Semester (Fall)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40433201	Computer Networks	3	4024101	
40212101	Data Structures	3	40421211	
40322101	Websites Design	3	4024101	
40322203	Visual Programming	3	40421211	
40342101	Systems Analysis and Design	3	40241202	
	University Core Requirement	3		
Total		18		

2 nd Semester (Spring)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40442203	Mobile Operating Systems	3	40212101	
40422207	Advanced Programming	3	40421211	
40252201	Database Management Systems	3	40241202	
40322202	Programming of Internet Applications	3	40241202+ 40322101	
	University Core Requirement	3		
Total		15		



Year 3				
1 st Semester (Fall)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40213103	Algorithms Design and Analysis	3	40212101	
40354106	Human Computer Interaction	3	40322203	
40443105	Mobile Software Engineering	3	40342101	
40442104	Mobile Application Programming (1)	3	40421211	
	University Elective Requirement	3		
	Program Elective Requirement	3		
Total		18		

2 nd Semester (Spring)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40434103	Network Programing	3	40433201	
40442204	Integrative programming and Technologies	3	40442104	
40264401	Communication and Writing Skills	3		
40253205	Information Systems Security	3	40322202	
	University Elective Requirement	3		
	Program Elective Requirement	3		
Total		18		



Year 4				
1 st Semester (Fall)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40443106	Mobile Computing Simulation	3	40213103	
40444110	Programming Games for Smart Devices	3	40322203	
40444111	Multiplatform Mobile Application development	3	40442104	
40494203	Applied Graduation Project (1)	1	Complete 90 CH	
	University Core Requirement	3		
	University Core Requirement	3		
Total		16		

2 nd Semester (Spring)				
Code	Course Name	Credit Hours	Prerequisite	Corequisite
40434205	Cloud Computing Systems	3	40433201	
40484101	Field Training on MC	3	Complete 90 CH	
40494204	Applied Graduation Project (2)	2	40494203	
	University Elective Requirement	3		
	Program Elective Requirement	3		
Total		14		



Courses Description

40212101 Data Structures

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40421211 Object Oriented Programming)

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 or research by the students.

40241101 Fundamentals of Information Technology

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -)

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, the course includes complete a practical project or research by the students.

40241202 Databases

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40241101 Fundamentals of Information Technology)

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 or research by the students.

**40241203 Laboratory of Database****(1 Credit Hours, Lecture: 0, Lab: 3, Corequisite: 40241202)**

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.

40312101 Discrete Mathematics**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 50551105 Principles of Mathematics and Statistics)**

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 or research by the students.

40322101 Websites Design**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40241101 Fundamentals of Information Technology)**

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.

**40421108 Introduction to Programming****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -)**

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. A brief introduction to classes and objects is also given. 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 or research by the students.

40421109 Laboratory of Introduction to Programming**(1 Credit Hours, Lecture: 0, Lab: 3, Corequisite: 40421108)**

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.

40264401 Communication and Writing Skills**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -)**

Concepts of administrative communication and to develop some of the skills he needs in his private life and career, in addition to his definition of the basic concepts of communication as a core and vital in the life of business organizations. To achieve this, the course will deal with the following topics: the nature, importance and objectives of the communication process, trends, elements and channels of communication, obstacles to effective communication, the basis of successful correspondence writing. In addition to the recognition of listening skills and teamwork and the management of meetings and interviews, the course includes complete a practical project or research by the students.

**40421211 Object Oriented Programming****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40421108 Introduction to Programming (C++))**

Object-oriented concepts (encapsulation, data abstraction, inheritance, and polymorphism) along with OO design using UML (unified modeling language). The OOP concepts covered using JAVA 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 or research by the students.

40421212 Laboratory of Object Oriented Programming**(1 Credit Hours, Lecture: 0, Lab: 3, Corequisite: 40421211)**

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.

40213103 Algorithms Design and Analysis**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40212101 Data Structures)**

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.

**40252201 Database Management Systems****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40241202 Databases)**

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 or research by the students.

40253205 Information Systems Security**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40322202 Programming of Internet Applications)**

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, the course includes the implementation of an applied project or research by students.

40322202 Programming of Internet Applications**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40322101 Websites Design + 40241202 Databases)**

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 or research by the students.

**40322203 Visual Programming****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40421211 Object Oriented Programming)**

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 (VB.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 or research by the students.

40342101 Systems Analysis and Design**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40241202 Databases)**

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.

**40354106 Human Computer Interaction****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40322203 Visual Programming)**

Introduction to the subject of Human-Computer Interaction (i) Specifying, Designing, Programming, and Implementing Graphical User Interfaces, Human-Centered Software Evaluation, Human-Centered Software Development; (ii) HCI Aspects of Multimedia Systems and Web-based Systems. The focus will be on (i) Understanding Human Behavior with Interactive Objects; (ii) Knowing how to develop and evaluate interactive software using a Human-Centered Approach; (iii) General Knowledge of HCI Design Issues with multiple types of interactive software, the course includes complete a practical project or research by the students.

40422207 Advanced Programming**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40421211 Object Oriented Programming)**

Advanced Programming with python provides students concepts in Programming with Python. It assumes basic knowledge of Python control constructs, functions, files, data structures, and the numpy library. The course will cover gathering data from various sources including web scraping, web API's, CSV and other structured data files, and databases; data cleansing; using the pandas library for data analysis; regular expressions and other string processing methods; classes and object-oriented programming; and building real-world software applications.

40433201 Computer Networks**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40241101 Fundamentals of Information Technology)**

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.

**40434103 Network Programming****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40433201 Computer Networks)**

Main concepts of transforming students into a Network Programmers. The students will learn how to design, develop and troubleshoot network applications using socket programming. Also, they will learn how clients and servers communicate with each other using socket programming. Covered topics include TCP/IP Protocol Stacks, Network Programming, Sockets, Port Numbers, Protocol Numbers, Domain Socket, Socket Functions, Socket System Calls, Client-Side Programming, Server-Side Programming, and Socket Debugging Techniques, the course includes complete a practical project or research by the students.

40434205 Cloud Computing Systems**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40433201 Computer Networks)**

The set of Mobile computing techniques and technology. It focusses on how cloud computing cloud is used and adapted to serve smart mobile technology. In the course, student will get knowledge about the main three cloud service models, which are: (1) Infrastructure as a Service (2) Platform as a Service and (3) Software as a Service. Besides, student will learn more about cloud applications such as Google Cloud, Amazon, Azure Microsoft, and SalesForce.com. The course includes complete a practical project or research by the students.

40442101 Wireless and Mobile communication Technologies**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -)**

The fundamentals of mobile wireless networking, including the tradeoff between capacity and coverage in a cellular system and the role of frequency reuse, cell sectorization, and cell splitting. It explores radio architecture and the multiple access techniques of TDMA, CDMA, and OFDMA together with the principal 2G standard (GSM), 2.5G standards (GPRS and EDGE), 3G standards (UMTS and cdma2000) and an introduction to a major 4G standard (LTE). The importance of wireless data in mobile wireless networking is also discussed.



40442203 Mobile Operating Systems

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40212101 Data Structures)

Concepts of the definition and role of the operating systems for mobile devices. Topics spanned functionality and structuring methods of a typical operating system especially for mobile devices; Introduction to modern operating systems for mobile devices, including device control, interrupts, synchronization and inter-process communication, process scheduling, memory management and virtual memory, disk management, and security. Students will apply their gained knowledge in a series of assignments, the course includes complete a practical project or research by the students.

40442204 Integrative programming and Technologies

(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40442104 Mobile Application Programming (1))

Examines the integration of systems and applications across global businesses; explores programming interfaces, data mapping and exchange, scripting, and programming languages to support the configuration, maintenance, integration, and security of systems. This is a technique which enable dynamic website and application development through the integration of programming and mark up languages into one for example html with XML, Javascript and CSS, XML with PHP, C# with XML, XML with XSLT and so on to meet the interactive and specific dynamic end-user requirements. They will also learn how to represent structure and how to transport data using XML and XML related technologies and protocols. Standardization of XML documents for the purpose of data exchange is stressed. Major topics include inter-systems communication, data mapping and exchange, integrative coding, scripting techniques, and an overview of programming languages. At the end of this course, the students are expected to be able to design, develop, and test an interactive web-based application on a given specification using any of the different integrated application and related technologies and protocols.

**40443105 Mobile Software Engineering****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40342101 Systems Analysis and Design)**

Concepts of software engineering using Android and Java. Students will learn: basic Java programming skills, Android operating system, Android application development, and strong software engineering practices. Students will learn how to read, obtain, and generate documentation. Moreover, students will learn good code testing strategies, the course includes complete a practical project or research by the students.

40443106 Mobile Devices Modeling and Simulation Methods**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40213103 Algorithms Design and Analysis)**

Exploration of simulation techniques that can be used to simulate/emulate mobile devices. For example, commercial iOS simulators (e.g. Electric Mobile Studio, Electric Mobile Simulator Lite, etc.) can be used to test iPad and iPhone browsing experience on a PC, the course includes complete a practical project or research by the students.

40442104 Mobile Application Programming (1)**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40421211 Object Oriented Programming)**

Build and working on mobile application based on Android Studio. The course builds student's ability to structure an application, design flexible and interactive interfaces, run services in the background, make applications work on various smartphones and tablets, and much more. It's like having an experienced Android developer sitting right next to students. This course requires some Java know-how. The course covers working with activities, intents, view, layout, android libraries and fragments.



**40444111 Multiplatform Mobile Application development
(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40442104 Mobile
Application Programming (1))**

The knowledge and the tools to design and implement applications for mobile devices for IOS and Android mobile using a mobile programming language as a cross-platform and native language based on a software development kit (SDK). Initially, the course will introduce mobile language environment install and configure, build mobile applications using a mobile programming language. Students will learn about concepts of mobile programming language, install, and plugin in mobile SDK on Android Studio. This course goes over the syntax and usage of mobile programming languages such as data types, constants, operators, control statements, and classes. As well as building mobile application layouts and connecting them with a database. At the end of this course, students will create and maintain a small mobile application project for IOS and Android, the course includes the completion of a practical or research project by students.

**40444110 Programming Games for Smart Devices
(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40322203 Visual
Programming)**

Understanding core game mechanics such as points, badges, levels, challenges, and leaderboards. Students will learn how consumers will engage with reward structures, positive reinforcement, and feedback loops. This course combines game mechanics with social interaction for activities such as collecting, gifting, heroism, and status. In addition, student will dive into case studies on Nike and Yahoo!, and analyze interactions at Google, Facebook, and Zynga. They will get the architecture and code to gamify a basic consumer site, and learn how to use mainstream gamification APIs from Badgeville, the course includes complete a practical project or research by the students.

**40484101 Field Training on MC
(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: Complete 90 Credit Hours)**

Training is required for each student in one of organizations for not less than 8 weeks and 200 hours of training, the practice regulations are according to the training regulations issued and approved by the department, collage and dean's council of the university.

**40494203 Applied Graduation Project (1)****(1 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: Complete 90 Credit Hours)**

Phase 1 (Analysis and Design), Applied project includes theoretical and practical practices related to the current problems and applications in Mobile Computing, applied research oriented, technical report, and presentation.

40494204 Applied Graduation Project (2)**(2 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40494203 Applied Graduation Project (1))**

Phase 2 (Implementation), Applied project includes theoretical and practical practices related to the current problems and applications in Mobile Computing, applied research oriented, technical report, and presentation.

40444111 Mobile Application Programming (2)**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40442104 Mobile Application Programming (1))**

Main concepts of the programming and development for device that work using iOS system by using Swift programming language. This course will help student to learn and explore the more advanced capabilities of the mobile web, including markup, Table View, Split View, Collection View Popovers advanced styling techniques, Storyboard and mobile Ajax. In addition, Student will learn more about the using database and Background Processing. Furthermore, this course will cover how to use Map Kit, XML and JOSN, the course includes complete a practical project or research by the students.

40443112 Multimedia Technologies for Smart Devices**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40322203 Visual Programming)**

Main concepts of multimedia technologies that interact with smart device-based applications to communicate ideas and information with digital, and print elements. Students can develop and manage smart multimedia content using specialized audio and video editing tools. At the end of this course, students will be able to classify and compare the types of multimedia technologies for smart devices and create and maintain a small multimedia application project for the smart devices, the course includes the completion of a practical or research project by students.

**40444213 Special Topics in MC****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -)**

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

40443214 Smart Devices Organization and Architecture**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40442203 Mobile Operating System)**

Work with mobile operating systems and platforms such as Android and/or iOS (iPhone/iPad) and to quickly understand concepts of other mobile platforms. Besides a review of the operating systems and application programming interfaces of these platforms, this course provides the necessary basics for mobile operating system: ARM and Intel architectures - Power Management - Mobile OS Architectures - Underlying OS - Kernel structure and native level programming - Runtime issues- Approaches to power management.

40444215 Smart Devices Application Branding**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40442104 Mobile Application Programming (1))**

Basic concepts of branding, usable branding design, and branding marketing strategy. Students will be able to describe the importance of brands and to compare between the global and famous smart device application brands. At the end of this course, students can design their own smart brands using specialized editing tools, and the course includes the completion of a practical or research project by students.

40444216 Business & Marketing for Smart Devices**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40443105 Mobile Software Engineering)**

The impact of mobility on E-commerce. First, it introduces m-commerce as an extension to E-commerce based on the use of mobile devices and related technologies. An investigation in m-commerce business models, value chain, and business applications are then presented. And finally, a discussion of the technical and social aspects of m-commerce such as Mobile Security, Mobile Payments, and Mobile Privacy are presented. Since location is natural dimension of mobility, the course discusses technologies related to location such as spatial databases and location-based services.

**40444217 Smart Devices Network****(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40433201 Computer Networks)**

An introduction to Wireless Networks and their design and functionality. Wireless network infrastructure and standards, networking with wireless network knowledge, IoT devices and sensor networks applications implementations and design.

40444218 UI/UX for Smart Devices**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40443105 Mobile Software Engineering)**

Exploring techniques to create applications providing a rich user experience (UX) on mobile devices with limited screen size, multi-touch screen control and passive sensing capabilities. Identify methods used to gain a thorough understanding of user needs, translate user needs into design solutions and evaluate designs through usability testing. Discuss best practices applicable to user interface (UI) design for mobile applications.

50551105 Principles of Mathematics and Statistics**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -)**

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.

50223121 Numerical Analysis**(3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 50551105 Principles of Mathematics and Statistics)**

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.