



College of Information Technology

Software Engineering Department

Study Plan for Bachelor's Degree in Software Engineering (Dual Studies Track) Academic Year 2025/2026

Study Plan Credit hours (132)

Type of Program: **Blended**

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	45%
Face-to-face learning (for scientific majors)	30% Minimum	35%

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 the software engineering field, locally and regionally.

Department Mission

Preparing qualified students with competencies in the software engineering field, having the applied and research knowledge and the skills to meet the requirements of the labor market and local community institutions according to quality criteria locally and internationally.

Program Mission

Preparing qualified students in the software engineering field to meet local and international standards and community requirements according to eLearning criteria.

Educational Program Objectives

1. Possess necessary skills of theoretical and applied knowledge in the field of Software Engineering.
2. Gain professional competence and practice their profession with confidence and regional competitiveness with others.
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 community's needs.

Educational Program Outcomes

Graduates of the program will have the 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 system development methodologies in conformance with software quality standards.
- [SE]



Contents of the Study Plan

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

No	Requirement Type	Credited Hours	Percentage
First	University Requirements	27	20%
Second	College Requirements	18	14%
Third	Program Requirements	87	66%
Total		132	100%

University Coding System

4	0	3	-	Year	Term	-	-
College Code	Department Code		Knowledge Area	Course Level		Course Sequence	

Knowledge Areas

No	Knowledge Area	Credit Hours in the Study Plan
1	Computer Science and Algorithms: Discrete Mathematics, Data Structures, Algorithms Analysis and Design.	9
2	Programming: Object-Oriented Programming, Visual Programming, Web Application Programming	9
3	Main Computer Components: Digital Logic Design, Computer Organization and Architecture, Operating Systems, Computer Networks.	12
4	Applications and Information Science: Database, Database Systems Management, Systems Analysis and Design.	9
5	Courses in Software Engineering: Fundamentals of Software Engineering, Software Specification and Design, Software Testing Software and Quality Assurance, Software Architecture, Software Development and Documentation, Software Project Management.	18
6	Supporting Knowledge Areas: Principles of Statistics and Probability Linear Algebra (I).	6
7	Elective Courses: Several courses within the sub-field of the program.	9
8	Field training: 3 hours after passing a minimum of 80 credit hours.	3
9	Graduation Project: 4 credit hours after passing 90 credit hours.	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				
√			5051104	Communication Skills -Arabic Language (1)	3	5051111
√			5051105	Communication Skills English Language (1)	3	5051112
√			50511205	Life Skills	3	-
√			50511206	National Education	3	-
√			50511305	Innovation and Entrepreneurship	3	-
√			50511308	Military Sciences	3	-
√			5054209	Volunteer Work and Community Development	0	-
Total					18	

B. University Elective: choose (9) Credit Hours from the following courses

Teaching type			Course Number	Course Title	Credited Hours	Pre-Requisite
Online E-Learning	Blended	Face-to-Face				
√			50521106	Communication Skills -Arabic Language (2)	3	5051104
√			50521107	Communication Skills-English Language (2)	3	5051105
√			50521203	Principles of Psychology	3	-
√			50521204	Human Rights	3	-
√			50531101	Islamic Culture	3	-
√			50531205	Quds and Hashemite Custodianship	3	-
√			50541103	Computer Skills	3	5051113
√			50541204	Environment and development	3	-
√			50541206	Health and Community	3	-
√			50541308	Foreign Language	3	-
√			50541309	Digital Culture	3	5051113
√			50541211	Introduction to Artificial Intelligence	3	-
√			50541208	Introduction to Sustainable Development	3	-
Total					9	



C. Remedial course: (0) Credit Hours

Teaching type			Course Number	Course Title	Credited Hours	Pre-Requisite
Online E-Learning	Blended	Face-to-Face				
√			5051111	Remedial Course in Arabic	3	-
√			5051112	Remedial Course in English	3	-
√			5051113	Remedial Course in Computer Science	3	-
Total					0	

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
	√		50521101	Calculus (I)	3	3	0	
		√	50511208	Discrete Mathematics	3	3	0	50521101
	√		40733203	Operating Systems	3	3	0	40712102
		√	40713104	Algorithms Analysis and Design	3	3	0	40712102
Total					18	18	0	

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						
		√	40712102	Data Structures	3	3	0	40721203
		√	40712103	Laboratory of Data Structure	1	0	2	40712102 (co)
		√	40742202	Databases	3	3	0	40712102
		√	40742203	Laboratory of Databases	1	0	2	40742202 (co)
		√	40721101	Introduction to Programming	3	3	0	
		√	40721102	Laboratory of Introduction to Programming	1	0	2	40721101 (co)
	√		50511209	English Language for Information Technology	1	1	0	



Teaching type			Course Number	Course Title	Credited Hours	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
		√	40721203	Object-Oriented Programming	3	3	0	40721101
		√	40721204	Laboratory of Object-Oriented Programming	1	0	2	40721203 (co)
		√	40343101	Database Management Systems	3	3	0	40742202
		√	40722106	Visual Programming	3	3	0	40712102
		√	40722205	Programming of Internet Applications	3	3	0	40722101 + 40742202 (co)
	√		40732101	Digital Logic Design	3	3	0	40711201
	√		40732202	Computer Organization and Architecture	3	3	0	40352201
		√	40743107	Systems Analysis and Design	3	3	0	40352201
		√	40352201	Fundamentals of Software Engineering	3	3	0	40721203
	√		40353102	Software Requirements Engineering	3	3	0	40352201
	√		40353103	Software Project Management	3	3	0	40354107
		√	40353204	Software Specifications and Design	3	3	0	40353205
	√		40353205	Software Architecture	3	3	0	40352201
	√		40354219	Artificial Intelligent Applications in Software Engineering	3	2	2	40713104
	√		40354107	Software Engineering Tools	3	3	0	40743107
	√		40354208	Software Development and Documentation	3	3	0	40353204
		√	40354209	Software Testing and Quality Assurance	3	3	0	40743107
	√		40394200	Applied Graduation Project (1)	2	0	2	Complete 90 H
	√		40394204	Applied Graduation Project (2)	2	0	2	40394200
		√	40743204	Computer Networks	3	3	0	40741101
Total					69	61	15	

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						
	√		40354210	Special Topics	3	3	0	Complete 60 H



Teaching type			Course Number	Course Title	Credited Hours	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
	√		40352212	Introduction to Data Science	3	3	0	40742202
	√		40353213	Business Analysis	3	3	0	40743107
	√		40353214	Software Quality Management	3	3	0	40353102
	√		40354215	Software Engineering Ethics	3	3	0	40352201
	√		40354217	Programming Using Python	3	3	0	40721203
	√		40354201	Software Security	3	3	0	40354208
	√		40354218	Emerging Topics	3	3	0	Complete 60 H
	√		40354106	Human Computer Interaction	3	3	0	40743107
Total					9	9	0	

C. Ancillary Courses: (6) Credit Hours

Teaching type			Course Number	Course Title	Credited Hours	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
	√		50531100	Principles of Statistics and Probability	3	3	0	
	√		50212104	Linear Algebra (I)	3	3	0	50521101
Total					6	6	0	

D. Dual Program Requirements: (3) Credit Hours

Teaching type			Course Number	Course Title	Credited Hours	Theoretical	Practical	Pre-Requisite
Online E-Learning	Blended	Face-to-Face						
	√		40384102	Field Training	3	0	3	Complete 80 H
Total					3	0	3	

Advisory Plan

First Year



First Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
50521101	Calculus (I)		3		
40741101	Fundamentals of Information Technology	Blended	3		
40721101	Introduction to Programming	Face-to-Face	3		
40721102	Laboratory of Introduction to Programming	Face-to-Face	1		40721101
	University Core Requirement	Online E-Learning	3		
	University Elective Requirements	Online E-Learning	3		
Total			16		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
50511208	Discrete Mathematics	Face-to-Face	3	50521101	
40721203	Object-Oriented Programming	Face-to-Face	3	40721102	
40721204	Laboratory of Object-Oriented Programming	Face-to-Face	1		40721203
40722101	Websites Design	Blended	3	40741101	
	University Core Requirement	Online E-Learning	3		
	University Elective Requirements	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 Structure	Face-to-Face	1		40712102
40732101	Digital Logic Design	Blended	3	40711201	
40352201	Fundamentals of Software Engineering	Face-to-Face	3	40721203	
40743204	Computer Networks	Face-to-Face	3	40741101	
50231110	Principles of Statistics and Probability	Blended	3		
Total			16		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40742202	Databases	Face-to-Face	3	40712102	40742202
40742203	Laboratory of Databases	Face-to-Face	1		40742202
40722205	Programming of Internet Applications	Face-to-Face	3	40722101	
40743107	Systems Analysis and Design	Face-to-Face	3	40352201	
40353102	Software Requirements Engineering	Blended	3	40352201	
50212104	Linear algebra (I)	Blended	3	50521101	
Total			16		

* Credit Hours



Third Year

First Semester

Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
50511209	English Language for Information Technology	Blended	1		
	University Core Requirement	Online E-Learning	3		
40722106	Visual Programming	Face-to-Face	3	40712102	
40343101	Database Management Systems	Face-to-Face	3	40742202	
40732202	Computer Organization and Architecture	Blended	3	40732101	
40353205	Software Architecture	Blended	3	40352201	
Total			16		

Second Semester

Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40353204	Software Specification and Design	Face-to-Face	3	40353205	
40733203	Operating Systems	Blended	3	40712102	
40354209	Software Testing and Quality Assurance	Face-to-Face	3	40743107	
40354107	Software Engineering Tools	Blended	3	40743107	
40354106	Human Computer Interaction	Blended	3	40743107	
	University Core Requirement	Online E-Learning	3		
Total			18		

Summer Semester (full practical)

Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40384102	Field Training	Blended	3	Complete 80 CH	
	University Core Requirement	Online E-Learning	3		
Total			6		

* Credit Hours



FD26-1, Rev. d

Ref.: Deans' Council Session (16/2025-2026), Decision No.: 11, Date 23/12/2025





Fourth Year

First Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40353103	Software Project Management	Blended	3	40354107	
40354208	Software Development and Documentation	Blended	3	40353204	
40394200	Applied Graduation Project (I)	Blended	2	Complete 90 CH	
40713104	Algorithms Analysis and Design	Face-to-Face	3	40712102	
	Program Elective Requirement	Blended	3		
Total			14		

Second Semester					
Course No.	Course Title	Type of Learning	Credited Hours*	Prerequisite	Co-requisite
40394204	Applied Graduation Project (2)	Blended	2	40394200	
	University Core Requirement	Online E-Learning	3		
	University Elective Requirements	Online E-Learning	3		
	Program Elective Requirement	Blended	3		
	Program Elective Requirement	Blended	3		
Total			14		



Courses Tree

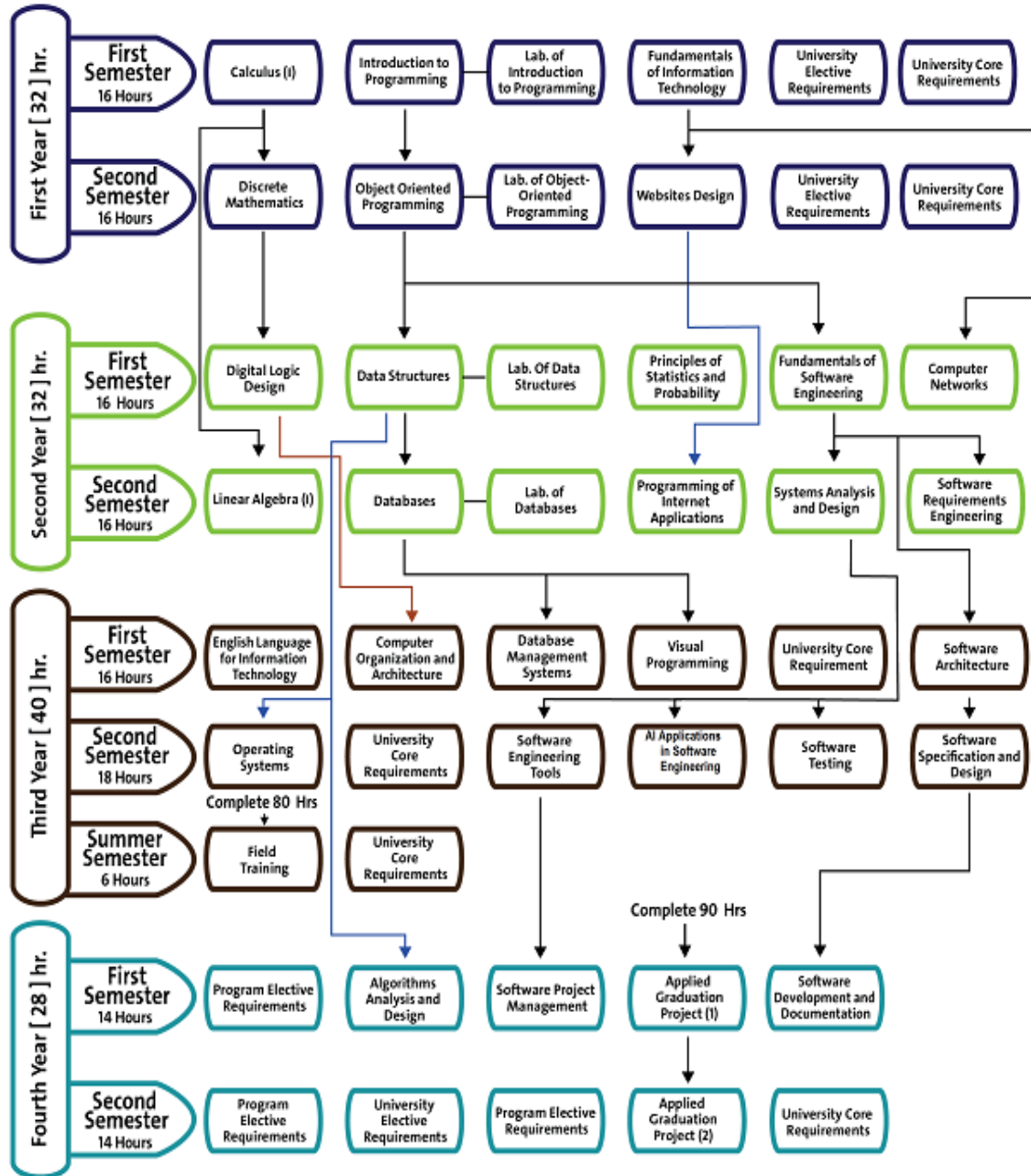
College: College of Information Technology

Department: Software Engineering

Major: Software Engineering

Program: Bachelor

Issue Number 11 - Date:1/8/2025





Courses Description

(40721101), Introduction to Programming (3 Credit Hours, Lecture: 3, Lab: 0, 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, Lecture: 0, Lab: 2, Corequisite: 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, Lecture: 3, Lab: 0, 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, Lecture: 3, Lab: 0, 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, Lecture: 0, Lab: 2, Co-requisite: 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.



(50511208), Discrete Mathematics (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 50521101 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, Lecture: 3, Lab: 0, 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, Lecture: 0, Lab: 2, Co-requisite: 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, Lecture: 3, Lab: 0, 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, Lecture: 3, Lab: 0, Prerequisite: 40712102 Data Structure, 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, Lecture: 0, Lab: 2, Co-requisite: 40742202 Databases, 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, Lecture: 3, Lab: 0, Prerequisite: 40742202 Databases, Face-to-Face)

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.

(50511209), English Language for Information Technology (1 Credit Hours, Lecture: 1, Lab: 0, 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.

(40713104), Algorithms Analysis and Design (3 Credit Hours, Lecture: 3, Lab: 0, 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 Systems (3 Credit Hours, Lecture: 3, Lab: 0, 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, Lecture: 3, Lab: 0, Prerequisite: 40722101 Websites Design, Co-requisite: Database 40742202, 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.

(40352201), Fundamentals of Software Engineering (3 Credit Hours, Lecture: 3, Lab: 0, 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.

(40343101), Database Management Systems (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40742202 Databases, Face-to-Face)

This course covers 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.

(40732101), Digital Logic Design (3 Credit Hours, Lecture: 3, Lab: 0, 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, Lecture: 3, Lab: 0, 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.

(40743107), Systems Analysis and Design (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40352201 Fundamentals of Software Engineering, Face-to-Face)

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.

(40353102), Software Requirements Engineering (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40352201 Fundamentals of Software Engineering, Blended)

Basic concepts and principles of software requirements engineering, its tools, methods, validation techniques to analyze and specify prototypes and maintaining software requirements. Topics include requirements elicitation, prototyping, functional and non-functional requirements, object-oriented techniques, and requirements tracking.

(40353103), Software Project Management (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40354107 Software Engineering Tools, Blended)

Introduction to issues and techniques of project management. Project evaluation and selection, scope of management, team building, stakeholder management, risk assessment, scheduling, quality, rework, negotiation, and conflict management. Professional issues including career planning, lifelong learning, software engineering ethics, and the licensing and certification of software professionals.

(40353204), Software Specifications and Design (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40353205 Software Architecture, Face-to-Face)

This course introduces the software design process and differentiates between its activities. Special emphasis to work with clients and to learning about the needs of users who interact with a system. It concentrates on requirements elicitation and specifications in software design document. The course addresses elicitation, specification, and management of software system requirements. It emphasizes on the concept of architectural styles and detailed design patterns against to SRS from two perspectives: the software engineering principles that



enable development of quality software, and the application of design patterns as a means of reusing design models that are accepted best practices.

(40353205), Software Architecture (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40352201 Fundamentals of Software Engineering, Blended)

This course introduces a holistic view to software architecture and its related quality attributes; it aimed to discuss the most common architectures, their qualities, and tradeoffs. As well as how architectures are evaluated, what makes a good architecture, and its related improvements. In addition, the course presents important new tools and techniques related to the software architecture life cycle including the design philosophy, testing of software architecture, and current technologies used such as cloud programming architecture, and social networks, the course includes complete a practical project or research by the students.

(40354106), Human Computer Interaction (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40743107 Systems Analysis and Design, Blended)

This course explores the following topics as an introduction to the subject of Human-Computer Interaction (HCI) (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.

(40354107), Software Engineering Tools (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40743107 Systems Analysis and Design, Blended)

This course provides students with a high-level discussion of tools successfully used in today's software engineering projects. Beyond state-of-the-art technology and current trends, it also provides them with a discussion of visions and possible future trends of software development. Likewise, it will provide them with explanation of how tools support several activities in a software engineering life cycle; tools for managing work products, for requirements engineering, design, coding, testing, version control, configuration management, deployment, and documentation are considered, as are tools for project management and tracking. Therefore and after summarizing the features of each software engineering tool on a conceptual level, student can be able to estimate the potential risks and rewards of various software tools to decide which is best suited for their task. The course includes complete a practical project by the students.

(40354208), Software Development and Documentation (3 Credit Hours, Lecture: 3, Lab: 1, Prerequisite: 40353204 Software Specifications and Design, Blended)

This course discusses issues, methods and techniques associated with software development. Topics include detailed design methods and notations, implementation tools, coding standards and styles, and maintenance issues. The course also introduces major concepts of software documentation. Emphasis on construction of software system artifacts that support team development and evolution of software systems (e.g. Project proposals, progress reports, requirements, specifications, design, test plans, test reports, project reports), the course



includes a complete practical project or research by the students. Practical assignments are included using Java, Javadoc, NetBeans, Git, and GitHub.

(40354209), Software Testing and Quality Assurance (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40743107 Systems Analysis and Design, Face-to-Face)

This course provides an overview of software testing. Covers software quality assurance; black-box and white-box testing including graph coverage criteria; integration and regression testing; and selected topics from the following: object-oriented software testing, acceptance testing, conformance testing, diagnostic testing, test execution, distributed systems testing, test languages and test tools, GUI testing, interoperability testing, test metrics, and standards for software quality and testing.

(40384102), Field Training (3 Credit Hours, Lecture: 0, Lab: 3, Prerequisite: Complete 80 Credit Hours, Blended)- Dual Study.

The field training for Software Engineering students aims to integrate them into a real work environment. A training plan is agreed upon with the host organization, including participation in tasks such as software development, systems analysis, and designing technical solutions. The training enables students to apply their academic knowledge and skills to real-world projects, while gaining professional competencies such as organization, teamwork, effective communication, and adherence to professional ethics. It also enhances the student's understanding of the software engineer's role within teams and provides a clear perspective on tech company culture and market positioning, in addition to expanding their professional network in preparation for their future careers.

(40394200), Applied Graduation Project (1) (2 Credit Hours, Lecture: 0, Lab: 2, Prerequisite: Complete 90 Credit Hours, Blended)

This course aims to enable students to begin implementing a comprehensive practical graduation project as part of a team, by applying the principles and methodologies they have learned throughout their studies in Software Engineering. This course represents the first part of a two-part graduation project (Applied Project 1 and Applied Project 2), and focuses on the stages of analysis, initial planning, and determining the development methodology to be used.

Students are required to work in teams to identify a real-world problem related to their field of study and begin formulating a software-based solution using modern software engineering methodologies. They are guided by an academic supervisor and are required to submit progress reports and a presentation at the end of the course, in addition to presenting the project before an academic committee.

(40394204), Applied Graduation Project (2) (2 Credit Hours, Lecture: 0, Lab: 2, Prerequisite: 40394200 Applied Graduation Project (1), Blended)

This course is a continuation of what students began in 'Applied Graduation Project (1)', where they carry out the actual development phases of the designed system or application. The course includes programming, testing, final documentation, and presenting the project before an academic committee. The course aims to deepen students' understanding of the full development lifecycle through a comprehensive





hands-on experience—from design to the delivery of a complete and functional software product ready for use or deployment. Emphasis is placed on quality standards, the use of software engineering tools and techniques learned during their academic studies, and adherence to the specified project timeline.

(40743204), Computer Networks (3 Credit Hours, Lecture: 3, Lab: 0, 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.

(40354210), Special Topics in Software Engineering (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: Complete 60 CH, Blended)

Special topics of current trends in Software Engineering, the course includes completing a practical project or research by the students.

(40353214), Software Quality Management (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40353102 Software Requirements Engineering, Blended)

The course emphasizes the importance of nonfunctional requirements for the software development life cycle. Quality attributes and software metrics represent the core principles for software performance evaluation. In addition, Dimension of Software Quality, Measuring Software Quality using Quality Metrics, Quality Function Deployment (QFD) in Software Quality, Quality Assurance (QA) vs Quality Control (QC), Quality Assurance Models and software quality models. Also, Total quality management (TQM) will be introduced.

(40352212), Introduction to Data Science (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40742202 Databases, Blended)

This course will provide undergraduate students with fundamental concepts, principles to extract and generalize knowledge from data. Students will acquire an integrated set of skills spanning data processing, statistics and machine learning, along with a good understanding of the synthesis of these skills and their applications to solving problem. The course includes complete a practical project by the students.

(40353213), Business Analysis (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40743107 System Analysis and Design, Blended)

A solid foundation in business analysis, exploring the strategy, phases, components and process a BA uses to develop a project. From conducting an enterprise analysis to assessing the solution's implementation, student will





learn the basics of how to manage the process and determine the appropriate parties to be involved. This course will discuss project requirements (the needs that must be fulfilled to complete the initiative), how to develop a communications plan, distributing work responsibilities, creating a business model and more. The course finishes with a discussion about tasks that the BA encounters when the solution is put into place.

(40354201), Software Security (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40354208 Software Development and Documentation, Blended)

An overview of security issues for software, and provides programming methods for the development of secure applications. By the end of the course, students should be able to perform security risk management to assess the security risk of a system under development. Moreover, students will be able to perform all types of security testing. They will understand secure coding practices to prevent common vulnerabilities from being injected into software. Besides, students will be able to write security requirements (which include privacy requirements). They will be able to validate these requirements and to perform additional verification practices of static analysis and security inspection.

(40354215), Software Engineering Ethics (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40352201 Fundamentals of Software Engineering, Blended)

Ethical problems that software engineers face, the codes of ethics of computing professional societies, legal issues involved in technology, and the social implications of computers, computing, and other digital technologies.

(40354217), Programming using Python (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: 40721203 Object-Oriented Programming, Blended)

Programming using Python introduces students to programming concepts using Python. Basic knowledge of Python control structures, functions, files, data structures, and the numpy library is assumed. The course will cover data collection from various sources, including web scraping, Web APIs, CSV, and other organized data files, as well as databases. Data will be analyzed using the pandas library for data analysis. The curriculum will also include regular expressions, string manipulation techniques, classes, object-oriented programming, and building real-world software applications.

(40354218), Emerging Topics in Software Engineering (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: Complete 60 CH, Blended)

This course provides an in-depth exploration of the latest trends, technologies, and methodologies in software engineering. It aims to keep students at the forefront of the industry by studying contemporary developments and their practical applications, as well as studying market requirements. The course includes completing a practical project or research by the students.

(40354219), Artificial Intelligent Applications in Software Engineering, (3 Credit Hours, Prerequisite: 40713104 Algorithms Design and Analysis, Blended).





This course explores the integration of AI technologies into software engineering. It focuses primarily on how AI can enhance, automate, and innovate various software development processes. Students will learn about AI methodologies and their practical applications in software project management, requirements analysis, design, coding, testing, maintenance, and more.

(50521101), Calculus (1), (T: 3, P: 0) Credit hrs., Prerequisite: (Non) , type of learning: 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.

(50531100), Principles of Statistics and Probability (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: -, 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.

(50212104), Linear Algebra (1) (3 Credit Hours, Lecture: 3, Lab: 0, Prerequisite: (50521101), 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.