Course Descriptions for the Undergraduate Computer Sciences Program 2025/2026

1. University Required Courses

ADM 105 Introduction to Information Technology (3 credits)

This course aims to give the students general knowledge about microcomputers and their applications which can be used later in their field of study. These applications are; word processing, computer presentation, spreadsheet, and the Internet/Communication concept.

LIT 105 Arabic Civilization (3 credits)

This course introduces the overall concepts of civilization and the most important factors that contributed to the emergence of Islamic civilization. It also encompasses the main characteristics of the Islamic civilization with a particular focus on the human dimension. Manifestations of Islamic civilization in policy, management, economy, society, and sciences are emphasized; topics discussed include the Caliphate, the Ministry, the Emirate, tax calculations, the judiciary, the mandate of grievances, the police, government bureaus, the treasury, mail department, the army, the navy, women's rights and contributions, intellectual life, sciences, technological manifestations, and others. The impact of Islamic civilization in the European Renaissance, the reasons for the decline of civilization, and ways to address them are also discussed.

LIT 110 Arabic Language I (3 credits)

The primary aim of this course is to familiarize the students with correct writing styles, avoid linguistic and spelling errors, use proper punctuation, and master various correspondence styles. The course also discusses the main principles of Arabic grammar through selected texts, spelling rules, writing paragraphs about subjects related to the selected texts, summary techniques, punctuations, rules of number spelling, common linguistic errors, titles, Curriculum Vitae editing techniques, methods of writing minutes of meetings, and administrative correspondences.

LIT 120 English Language I (3 credits)

This is a study skills course that aims at developing potential teacher's proficiency in the skills of test taking, studying, word attacking, paraphrasing, restating, and handwriting.

LIT125 English Language II (3 credits)

This course aims to stimulate the interest of intermediate students to develop their skills of speaking, reading, and writing through interesting content in a variety of subjects. The course also revises and extends the students' active knowledge of grammar and vocabulary through varied activities. This course works on writing that is related to the reading material which gives the students the opportunity to use what they have learned.

2. Faculty and Major Required Courses

MAT101 Discrete Math (2 credits)

This course offers the mathematical structures that are related to computer science. Its objective is to give some mathematical background for computer scientists and introduce some computer applications of mathematical theory. Topics include logic, relations, functions, basic set theory, countability and counting arguments, proof techniques, mathematical induction, graph theory, combinatorics, recursion, recurrence relations, elementary number theory, and graph theory.

PHY101 General Physics (3 credits)

The purpose of this course is to give students, primarily those in the field of computer science and biochemistry, a general overview of mechanics, electricity, electronics, thermodynamics, and modern physics, with emphasis on examples and applications in modern technology fields. At the end of this course, the student will have good knowledge of how a scientist or engineer makes use of physics concepts to contribute to technological advancement and impact society.

CSC101 Programming I (2 credits)

This course is designed for students with no prior programming experience. The course introduces the fundamental concepts of procedural programming using Java language. Topics include algorithms and problem-solving, data types, control structures, functions, arrays, files, and mechanics of running, testing, and debugging.

CSC101L Programming I Lab (1 credit)

This course is a co-requisite for the Programming I course (CSC101). Students apply in the lab the fundamentals of programming explained in CSC101, by solving lab exercises. The objective of the lab is to implement programming problems using basic data types, selection and repetition structures, methods, and arrays

CSC102 Logic Design (3 credits)

This course provides a modern introduction to logic design and the basic building blocks used in digital systems, particularly in digital computers. The first part of the course deals with a discussion of combinational logic: logic gates, minimization techniques, arithmetic circuits, and modern logic

devices such as field programmable logic gates. The second part deals with sequential circuits: flip-flops, synthesis of sequential circuits, and case studies, including counters, registers, and random access memories. The third part provides an introduction to machine language and assembly language programming. Concepts discussed include techniques for encoding data as numbers, instruction set design, and the IEEE floating point standard. Some practice examples are done using logiSim software.

STAT102 Probability & Statistics (3 credits)

This course aims to familiarize students with the proper use of numbers. It provides training on analyzing data actually observed and enumerate all theoretical figures of a well-defined situation. The objective of this course is to give students the basic concepts of descriptive statistical studies. At the end of the course, students will be able to read the data, represent, synthesize, summarize, and analyze. On the other hand, students will become familiar with the simplistic notion of probability calculation.

CSC103 Database Systems (2 credits)

This course covers the fundamental concepts of database systems. Topics include data models (ER, relational); mapping ER diagrams into relation schemas; reverse engineering; relational algebra, and SQL language.

CSC103L Database Systems Lab (1 credit)

This course is a co-requisite for the Database Systems course (CSC103). Students apply in the lab the concepts they learn in the Database Systems course by solving lab exercises. The concepts include data modeling (based on the entity-relationship model), data normalization, and data manipulation using SQL queries.

CSC104 Data Structure (2 credits)

Data structures help programmers to organize their information in a way that supports efficient processing. This course will give students a comprehensive introduction to common data structures, and algorithm design and analysis. More specifically, it covers sorting algorithms, stacks, queues, sequences, lists, priority queues, trees, and hash tables.

CSC104L Data Structure Lab (1 credit)

This course is a co-requisite for the Data Structure course (CSC104). Students apply in the lab the basics of data structure, explained in the course, by solving lab exercises using Netbeans. The objective of the lab is to implement programming problems using arrays, stacks, lists, queues, and other data structure elements.

MAT107 Calculus (3 credits)

This course is an intuitive approach to the techniques of calculus. It covers mainly two parts derivation and integration. Topics include: Limits, Implicit and Logarithmic Differentiation, Derivatives of Higher Order, Partial Differentiation and Applications, Taylor Expansion, Methods of Integration, Improper Integrals, Multiple Integrals, and Differential Equations.

MAT108 Linear Algebra (2 credits)

This course is prepared for students of computer science. Linear algebra is the study of linear systems of equations, vector spaces, and linear transformations. In this course, the focus is on the mathematical theory and methods of linear algebra with its application. Its objective is to let the student become able to solve linear equations, perform matrix operations, to find determinants, eigenvalues, and eigenvectors. The aim of this course is to present these fundamentals in the clearest possible way.

CSC209 Web Programming I (2 credits)

This hands-on course provides a thorough introduction to the creation of a website using HTML5, CSS3, and Javascript. The course starts with thorough coverage of HTML and Cascading Style Sheets (CSS) and progresses to using Javascript to create interactive web pages. The course does not require any prior knowledge of HTML or web design. Throughout the course, students are introduced to planning and designing effective web pages; Students should have a general background in using a computer, managing files, and a basic knowledge of the Internet. Students should also be able to navigate to and within a website using a web browser such as Chrome, Firefox, Edge, or Safari. Topics include the use of HTML5 semantic tags, block-level, and inline elements, creating links, ordered and unordered lists, and creation of tables and forms. Students will learn to attach CSS to a page using several different techniques, CSS selectors and pseudo-classes, CSS box model, and a variety of CSS properties. Students will learn how to create websites and navigate through the pages, implement CSS to produce any desired layout, use Javascript to create interactive pages, and control and manipulate data using forms. Comprehensive hands-on exercises are integrated throughout to reinforce learning and develop real competency.

CSC210 Object Oriented Programming (3 credits)

The course emphasizes the principles of Object Oriented Programming using the Java Programming Language. It starts by an introduction on how to create applications using Java. Then the course explains how to define classes, declare objects, and discuss the main topics related to object oriented programming (constructors, methods, dependency, aggregation, inheritance, and polymorphism). Finally, the course explains exceptional handling as well as writing to and reading from files.

MAT210 Operation Research (3 credits)

This course provides students with a clear understanding of the use and applications of Operations Research/Management Science (OR/MS) starting with problem formulation, concentrating on solution, methodology of problem, and dealing with the interpretation of solution results.

CSC211 Operating Systems (2 credits)

This course is an introduction to operating system basics. It focuses on the essential operating system concepts specifically those related to process and its creation and termination, process communication, process scheduling, and synchronization, it also provides an overview of memory management and strategies used for this purpose. By the end of this course, the student should fully understand operating system theory, structure, and mechanism. This would include Full analysis of

Multitasking systems and process communications as well as memory management. The student should be able to develop a project related to the Operating system Concept.

CSC211L Operating Systems Lab (1 credit)

This course is a co-requisite for the Operating System course (CSC211). Students apply the lab concepts they learn during the course by solving lab exercises. The concepts include a fundamental practice of Linux OS and the basics related to process management seen in the course. These basics include process creation and termination, process communication, and process synchronization using semaphore. The student will be able to practice concepts by developing, debugging, and testing programs under the Linux language.

CSC212 Mobile Applications (3 credits)

This course is a lab-based course in which students develop mobile applications across one of the most popular smartphone platforms; Android. The course covers every facet of development and deployment. Topics covered: Differentiating between Android and iPhone development environment, understanding the application life cycle, writing simple GUI applications, using builtin widgets and components, developing useful Android applications with compelling user interfaces, layout, views, and menus, using Android's APIs for SMS, telephony, databases, data storage, network management, internet resources (HTTP) and integration with existing web. Students should use Android Studio IDE.

CSC213 Visual Programming (2 credits)

This course teaches visual programming using the Visual Studio environment and Visual C# programming language. This course emphasizes the visual side of programming mainly the graphical user interface (GUI) components. (Windows Forms, Event-Handling, Control Properties, Layouts, Labels, Text Boxes, Buttons, Group Boxes, Panels, CheckBoxes, Radio Buttons, Picture Boxes, Tooltips, NumericUpDown, Mouse-Event Handling, Keyboard-Event Handling, Menus, Month Calendar, DateTimePicker, LinkLabels, ListBoxes, CheckedListBox, ComboBoxes, TreeViews, ListViews, TabControl, Single Document Interface (SDI) vs. Multiple Document Interface (MDI), …etc). Different examples will be discussed during the class with students.

CSC215 E-Buisness (3 credits)

This course describes the basic principles of e-business technologies. Upon the completion of this course, students should have a good working knowledge of e-business concepts, applications, and technologies (e.g. e-business marketplace, e-commerce, B2B e-business, e-learning, e-government, and online payments). In addition, after understanding the main concepts, students should understand how to initiate and launch an online business.

CSC216 Web Programming II (3 credits)

This course enables students to build dynamic database-driven (e-commerce) websites using the PHP programming language. The course is explicitly meant for students with limited experience and discusses basic programming building blocks needed to create interactive, dynamic websites. PHP is an open source-based programming language widely used on the Internet for both commercial and non-commercial websites such as Facebook, Wikipedia, and others. This course gives an introduction

to programming with PHP in combination with some simple database techniques in order to be able to understand how dynamic websites work.

CSC219 Entreprise Ressource Planning (3 credits)

This course will introduce you to enterprise systems and show you how different organizations use ERP systems to run their operations more efficiently and effectively. You will learn about the critical success factors and implementation strategies that lead to enterprise system success and about the informational, knowledge, and decision-making opportunities afforded by enterprise systems and in addition to Microsoft Dynamics 365.

CSC220 Entrepreneurship for Science (3 credits)

Entrepreneurship is both an Art and a Science. The Entrepreneur's ability to create something new represents the artistic aspect of the process and what follows embodies the science. Upon the completion of this course, students should have a good working knowledge of the entrepreneurial Processes: identify opportunity, evaluate feasibility, assemble resources, find potential customers, identify markets, build sales strategy, quantify value proposition, revenue generation, financial viability, product development, business plan, pitching to investor.

CSC222 Machine Learning with Python (2 credits)

This course provides a fundamental entrance to machine learning. Students will learn to use concise concepts, tools, techniques, and algorithms to build intelligent applications and systems that can learn from data. Topics covered include supervised learning for prediction and classification, unsupervised learning for pattern recognition, neural networks, model evaluation and validation, feature engineering and selection, ensemble methods for improved performance, model optimization and hyperparameter tuning, ethical considerations, and future trends. Through a collection of lectures and case studies, students will develop a steady foundation in machine learning and gain the skills to apply these techniques to real-world problems.

CSC223 Artificial Intelligence with Python(2 credits)

This course explores the concepts of modern artificial intelligence, diving into the ideas that give rise to technologies like handwriting recognition, and machine translation. Students will gain exposure to the introduction about AI algorithms, classification, segmentation, and other topics in artificial intelligence and machine learning, Then Python language will be introduced which helps the student to gain knowledge to work with AI. By course's end, students emerge with understanding of OpenCV library for basic machine learning application as well as knowledge of AI principles that enable them to recognize essentially how intelligent systems works.

CSC224 Introduction to Robotics and IoT (2 credits)

The course is designed to provide computer science students with a developed concept in coding, in which the use of hardware, communication, and exchange of data is optimized to guarantee tangible learning skills. Students will be able to use sensors and motors to achieve a certain task, understand development procedures in robotics work in groups, develop specific robotic solutions by the end of each session as part of the project-based approach used in this course, understand the connection

between hardware and software in robots and Internet of Things (IoT), and finally fully grasp the sense, plan, and act, essential to have in any automated solution.

CSC307 System Analysis and Design (3 credits)

This course provides an understanding of the system development process which links user requirements to the computer-based system. It emphasizes problem formulation and problem-solving. Students will learn how to collect requirements from users, analyze a problem domain, develop the appropriate analysis, and design models to formalize the requirements using object-oriented methods and appropriate theory.

CSC308 Networking (2 credits)

This course will introduce networking technologies and their implementation. Topics include the OSI reference model, network protocols, transmission media, networking hardware, and software. Using a top-down approach, this course presents this highly technical subject. The "top-down" approach allows instructors to cover the material in one course, rather than having separate courses on data communications and networking. Students will learn network concepts and protocols by configuring a network, observing the actual behavior of its components, and analyzing the results. Topics include Basic computer network components, network cabling and cable types, IP addressing and TCP/IP configuration, Peer-to-peer and switch-based networks, email, HTTP, DHCP and DNS servers, Intrusion attacks, and firewall configuration.

MAT310 Numerical Computation (2 credits)

The purpose of this course is to give students, primarily those in the field of computer science, an example of scientific software used in numerical computational fields, applied sciences, and engineering. Basically, students will be introduced to MATLAB, a technical computing platform. By the end of the course, students will have an overview of data analysis, modeling, visualization, and programming through MATLAB.

CSC390 Graduation Project (2 credits)

This course is designed as a practicum for computer science students who are expected to work in teams of 1-4 on projects chosen by faculty members. Teams will work closely with their faculty mentor in order to complete the project in a timely manner.

SCI001 Introduction to CyberSecurity (3 credits)

The Introduction to Cybersecurity course is designed for learners considering a career in cybersecurity. This exploratory course provides learners an introduction to cyber-security, by exploring ways to be safe online, the different types of malware and attacks, measures used by organizations to mitigate attacks, and researching career opportunities.

Introduction to Cybersecurity includes:

- Five chapters comprised of key topics.
- Chapters emphasize critical thinking, problem solving, collaboration, and the practical application of skills. Language describing concepts is designed to be easily understood by learners at all levels.

- Learners explore the basics of being safe online.
- Learners are introduced to different types of malware and attacks, and how organizations protect themselves against these attacks.