جمهورية مصر العربية
وزارة التعليم العالي والبحث العلمي
Ministry of Higher Education and Scientific Research

SH. A.
أكاديمية الشروق

المعهد العالى للحاسبات وتكنولوجيا المعلومات
مدينة الشروق - القاهرة
شعبة علوم الحاسب

Course specification

Course Code: CS 210

Course Title: System Analysis and Design

Academic Year: 2023 /2024

Course specification

(CS 210 – System Analysis and Design)

Course Outline	
Faculty:	*HICIT- (**Higher Institute for Computers & Information Technology**-El Shorouk Academy)*
Programme(s) on which the course is given:	Undergraduate program in Computer Science
Major or minor element of programme:	Compulsory / Elective
Department offering the program	Department of Computer Science
Department offering the course:	Department of Computer Science
Level	Second Level
Date of specification approval	DD/MM/YYYY

Basic Information				
Code:	CS 210	***Title:***	System Analysis and Design	
Prerequisites:		CS 103 Introduction to Information Systems		
Weekly Hours:				
Lecture: 2		**Exercise: -**	**Practical : 2**	**Total: 3** credit hours

Professional Information

Course Aims:

The objective of CS 210 is to give the student the knowledge and practice of how to study, analyze and design an information system.

Analyzing a system means to study and analyze a new information system or an already existing business system, to detect weaknesses, evolve its performance and functionalities, or to add a new functionality, how to conduct the data and information gathering techniques, how to model an existing and a proposed system and prepare its meta data.

Designing a system means to build its technical architecture, designing the system interfaces (including inputs, and outputs), the system databases, and designing the modules in a pseudo-code.

After completing this course: the student should be able to conduct system analysis and design phases, how to conduct data gathering techniques, how to build system models, how to detect system bottlenecks and propose solutions with versions, how to build the technical architecture, how to design the system interfaces (including inputs, and outputs), how to design the system databases, and how to design the modules in a pseudo-code.

Program Intended learning outcomes (ILOs)	
a1	Understand the essential mathematics relevant to computer science.
a2	Deep understanding the concepts of the different high-level programming languages.
b1	Define traditional and non-traditional problems, set goals towards solving them, and observe results.
b2	Perform comparisons between (algorithms, methods, techniques, etc.).
b3	Perform classifications of (data, results, methods, techniques, algorithms, etc.).
b4	Identify attributes, components, relationships, patterns, main ideas, and errors.
b5	Summarize the proposed solutions and their results.
c1	Use appropriate programming languages and design methodologies.
c2	Use appropriate web-based systems, tools and design methodologies.
c3	Use appropriate database systems.
c4	Perform independent information acquisition and management, using the scientific literature and Web sources.
c5	Specify, design, and implement and manage computer-based systems.
d1	Communicate effectively by oral, written and visual means.
d2	Work effectively as an individual and as a member of a team.

Program ILOs Covered by Course			
Knowledge and understanding	**Intellectual Skills**	**Professional and practical skills**	**General and Transferable skills**
A1, A2	**B1, B2, B3, B4**	**C1, C2, C3, C4, C5**	**D1, D2**

Intended learning outcomes of course (ILOs)

a. <u>Knowledge and Under-Standing:</u>

a1. Understanding the definition of a system, the description of its components, the various types of information systems, and the system development life cycle.

a2. Explain system analysis and design phases, including fact finding techniques, system modeling techniques, system technical architecture, designing the system interfaces, the system databases, and designing the modules in a pseudo-code.

b. <u>Intellectual Skills:</u>

b1. Think over existing weaknesses/difficulties in the current system, tending to be solved.

b2. Think over the overall system components and to propose new system that overcomes existing weaknesses.

b3. Thinking over the technical architecture components and the relationships against them.

b4. Thinking over the database design, the interfaces, and the program design.

c. <u>Professional and practical skills</u>

c1. Propose new business systems and their new components.

c2. Gather data from system owners and system users.

c3. Model an existing and proposed system.

c4. Designing the system technical architecture.

c5. Designing the database design, the interfaces, and the program design.

d. General and transferable skills

d1. Communicate with system owners to gather the required information.

d2. Work with a team to implement a system and write technical report

Topic	Contact Hours		
	No. of Hours	lecture	Lab
Fundamentals of Information System Development General, System Definition, Basic Terminologies, Information Systems, IS Definition, Components, and Types, System analysis definition, Need for System Analysis and Design, Roles of the System Analyst: What is a System Analyst, Responsibilities, Characteristics of Successful System Analyst	6	3	3
The System Development Approaches and Life Cycle General, Importance of System development Lifecycle (SDLC), SDLC phases and activities, System Development Methodologies (Definitions, Types: structured or waterfall, Spiral or incremental, Agile Approach, Object-Oriented Approach, Other Approaches), Project Payments Milestones.	6	3	3
Information requirements analysis: Basics of Requirements Determination, What Is a Requirement, Requirements Determination, Requirements Analysis Strategies (Problem Analysis, Root Cause Analysis, Duration Analysis, Activity-Based Costing, Informal Benchmarking, Outcome Analysis, Technology Analysis).	4	2	2
The analysis Phases. System analysis fundamentals, Introduction to System analysis, System analysis Phases, Systems Development Underlying Principles and fundamentals, Project Selection and Management and analysis processes (Project Selection, Creating the Project Plan, Staffing the Project, Managing and Controlling the Project, The Function Point Approach, Project Management Tools: The Gantt Chart and PERT Chart), Feasibility Analysis (Technical Feasibility, Economic Feasibility, and Organizational Feasibility) Structured and object-oriented analysis.	6	3	3
Fact Finding Techniques. Requirements Elicitation in Practice, Interviews, Joint Application Development (JAD), Questionnaires, Document Analysis, Observation, Selecting the Appropriate Techniques,	4	2	2
Modeling Techniques.	6	3	3

Introduction to Modeling, Process Modeling (Data Flow Diagrams, Data Dictionary), Data Modeling (Entity Relationship Diagram)			
Introduction to system design. System Design Phase: Definition, Phase Steps, System Design Context.	**4**	**2**	**2**
How to Build the System Technical Architecture. System Technical Architecture Basic Terms and Definitions, How to build System Technical Architecture, Stockholders affecting ~~What influence/affects~~ building architecture, What Makes a 'Good' Architecture?, Decisions Taken During STA Development	**6**	**3**	**3**
Designing the system inputs and system outputs. Input Design Objectives, Designing Input Screens, Internet & Internet Page Design, Output Design Objectives, Guidelines ~~When Designing Output:~~ Designing Printed Output, Designing Screen Output, and Designing a Web Site	**6**	**3**	**3**
Designing Interface screens, design patterns, program design. Interface Design Objectives, Types of Interface Screens, and Guideline for Dialogue Design (Meaningful communications, Minimal User Action, and Standard Options and Consistency), Guideline for Dialogue Design, and Expected Feedback for users, Design patterns, re-use and component-based design.	**4**	**2**	**2**
Typical Case Study	**8**	**4**	**4**

Teaching and learning methods	
Teaching and learning methods	**Used**
Lectures	√
Tutorial Exercises	√
Discussions.	√
Self – Learning (Reading material, Websites search,)	√
Self-studies	-
Group work	√
Presentation	
Problem solving/problem solving learning based	
Case study	
Synchronous E-Learning	
Video lectures	
Asynchronous E-Learning	

Student assessment methods & Schedule		
Methods	**Used**	**Week#**
Midterm Exam	√	**8**
Final Exam	√	**16**

Course Project	√	**3-14**
Course Work & Quizzes	√	**2-14**

Assessment Weight	
Assessment	Weight %
Mid Term Exam	5%
Course Project	10%
Final Exam	80%
Course Work & Quizzes	5%
Total	100

Course Work &Quizzes
Short Exams, Assignments, Research, Reports, Presentations
Class/Project discussion

List of references	
Essential books (textbooks)	System Analysis and Design Kenneth E. Kendall & Julie E. Kendall Prentice-Hall of India, 2001 Systems Analysis and Design (9th Edition) by Kenneth E. Kendall & Julie E. Kendall
Course notes	E-Learning Portal
Recommended books	Basic System Analysis Alan Daniels, Don Yeates, 1979
Periodicals, website	None
Videos link	

Required Facilities		
Tools & SW (Technology facilities):	- MS Project SW Package for scheduling projects - MS Power Point SW Package for presentation - MS Visio SW Package to build the Data flow diagrams - MS Access database SW Package to practice building and documenting ERD - MS Word SW Package for system documentation preparation	
Teaching facilities:	Whiteboard	√
	Computer Lab	√
	Data show	√
	E-Learning	√

	Videos	√
	Website	√

Course Content/ILO Matrix													
Course Contents	**Knowledge & understanding**		**Intellectual skills**				**Professional and practical skills**					**General**	
	a1	**a2**	**b1**	**b2**	**b3**	**b4**	**c1**	**c2**	**c3**	**c4**	**c5**	**d1**	**d2**
Fundamentals of System Analysis and Design	X		X										
Information requirements analysis.			X				X					X	
The analysis and Design Approaches.			X				X					X	
The analysis Phases.		X	X	X			X					X	X
Fact Finding Techniques.		X					X	X				X	
Modeling Techniques.		X	X	x			X		X				
Introduction to system design.							X						
How to Build the System Technical Architecture.		X	X	X	X					X			
Designing the system inputs and system outputs.		X			X	X					X		
Designing Interface screens, design patterns, program design.		x			X	X					X		
Typical Case Study	X	X	X	X	X	X	X	X	X	X	X	X	X

Learning Method /ILOs Matrix													
Learning Methods	**Knowledge and understanding**		**Intellectual skills**				**Professional and practical skills**					**General**	
	a1	**a2**	**b1**	**b2**	**b3**	**b4**	**c1**	**c2**	**c3**	**c4**	**c5**	**d1**	**d2**
Lectures	x	x	x	x	x	x	x	x	x	x	x	x	X
Tutorial Exercises				x	x	x	x	x	x	x	x		
Discussions.				x	x	x	x	x	x	x	x	x	x

Assessment Methods /ILOs Matrix													
Assessment Methods	**Knowledge & understanding**		**Intellectual skills**				**Professional & practical skills**					**General**	
	a1	**a2**	**b1**	**b2**	**b3**	**b4**	**c1**	**c2**	**c3**	**c4**	**c5**	**d1**	**d2**
Mid Term Exam	x	x	x	x	x	x	x	x	x	x	x		
Final Exam				x	x	x	x	x	x	x	x		
Course Project				x	x	x	x	x	x	x	x	x	x
Course Work &Quizzes	x	x	x	x	x	x	x	x	x	x	x	x	x

Course ILOs Vs Program ILOs														
Prog ILOs / Course ILOs		**Knowledge & understanding**				**Intellectual skills**					**Professional and practical skills**	**General**			
		A11	A17	A21	A22	B1	B8	B12	B13	B14	C2	D2	D7	D10	D12
Knowledge and Understanding	a1 a2														
Intellectual skills	b1 b2 b3 b4														
Professional and practical skills	c1 c2 c3 c4 c5														
General skills	d1 d2														

Course Coordinator : Dr. Magdy E. Elhennawy **( )**
Head of Department : Dr. Ahmed El-Abbassy **( )**
Date: --/--/2023