Future Academy
Higher Future Institute for Specialized Technological Studies

Course Specification

1- Course information:	
Course Code:	INM351
Course Title:	System Analysis and Design
Year/level	3rd
Academic Programs	Computer Science Program (B.Sc.)
Contact hours/ week	(Theoretical = 3hrs)

2- Course aims:

to provide students with the fundamental knowledge and practical skills needed to analyze, design, and implement information systems. The course covers key techniques for gathering and defining system requirements, modeling data and processes, and developing effective system architectures. Students will learn how to apply methodologies such as the Systems Development Life Cycle (SDLC), object-oriented analysis, and design (OOAD), and use tools like Unified Modeling Language (UML) to create well-structured, efficient, and scalable systems. By the end of the course, students will be equipped to contribute to the development of high-quality software solutions that meet user needs and business objectives.

3- Intended learning outcomes of the course (ILOs):

a- Knowledge and understanding:

On successful completion of this course, the student should be able to:

a1- Define the fundamental principles of system analysis and design, including system requirements and specifications.

a2- Locate and **recognize** key stages of the Systems Development Life Cycle (SDLC), such as feasibility, design, implementation, and maintenance.

a3- Identify and **state** the roles of stakeholders in the system development process, including users, analysts, and developers.

a4- Describe and **name** common modeling techniques such as data flow diagrams (DFDs), use case diagrams, and entity-relationship diagrams (ERDs).

a5- Outline the key objectives of requirements gathering, including functional and non-functional requirements.

a6- Recall and **list** different system design approaches, such as structured design, object-oriented design, and prototyping.

a7- Match appropriate system modeling tools to various design tasks, including UML for object-oriented design and DFDs for process modeling.

a8- Reproduce the steps involved in creating a system prototype and its role in iterative system development.

a9- State the importance of system documentation and how it contributes to the maintainability and scalability of the system.

a10- Determine and **explain** the challenges involved in system implementation and how to manage changes during the system's lifecycle.

b- Intellectual skills:

On completing this course, the student should be able to:

b1- Design system solutions by applying appropriate methodologies to analyze and model system requirements effectively.

b2- Compare different system design methods, such as structured design and object-oriented design, and **evaluate** their suitability for specific projects.

b3- Develop and **create** system models, including data flow diagrams (DFDs) and entity-relationship diagrams (ERDs), to represent business processes and data structures.

b4- Interpret user requirements and **formulate** system specifications that align with business goals and technical constraints.

b5- Solve complex system problems by applying analytical techniques, **modifying** existing models where necessary, and **reporting** the results to stakeholders.

c- Professional and practical skills:

At the end of this course, the student will be able to:

c1- Examine system requirements and **analyze** data to **differentiate** between functional and non-functional specifications.

c2- Illustrate system models such as data flow diagrams (DFDs) and use case diagrams to visually represent business processes and system interactions.

c3- Apply appropriate system development methodologies and **employ** best practices to ensure effective system design and implementation.

c4- Assess the feasibility of proposed system designs, **recommend** improvements, and **compare** alternative solutions based on cost, efficiency, and user needs.

c5. **Prepare** detailed system documentation, **summarize** the design and implementation processes, and **report** findings to stakeholders and project managers.

d- General and transferable skills:

On successful completion of this course, the student should be able to:

d1- Communicate effectively with stakeholders, team members, and users to gather requirements, share insights, and explain system designs.

d2- Work collaboratively in groups, leveraging diverse skills and perspectives to solve complex system design problems and contribute to successful project outcomes.

d3- Manage your own learning by engaging in **life-long learning** practices, staying updated with new technologies, tools, and methodologies in system analysis and design.

4- Course contents

Week No.	Topics/units	Number of hours		ILO's
		Lecture hours	Practical hours	
1	Introduction to System Analysis and Design	3	-	a1, a2, a3, a4
2	System Development Life Cycle (SDLC)	3	-	a4, a5, a6, a7, a8
3	Requirement Gathering and Analysis	3	-	a4, a5, a6, a7, a8
4	Quiz1 + Requirements Gathering and Elicitation	3	-	a3, a6, a9, c1, c2, c3
5	System Modeling and Analysis Tools	3	-	a10, a4, b1, b2, c2, d1
6	Feasibility Analysis and System Specifications	3	-	a9, b1, b2, c3 , d1, d2
7	Midterm Exam-			
8	Documentation, Reporting, and Communication	3	-	a5, b1 , b2, c3, d1,b5
9	Fact Finding Techniques	3	-	a5, b1 ,b2, c3, d1, b5
10	System Design and Prototyping	3	-	a6, b1 , b2, b3, c4, d1, d2
11	Quiz2 + System Design and Prototyping	3	-	a7, b4 , c5, d3
12	System Implementation and Coding	3	-	a7, b4 , c5, d3
13	System Testing, Maintenance and Quality Assurance	3	-	a8, c5 , c6
14	Final Project and Presentation	3	-	b4 , c5, d1,d2

5- Teaching and learning methods

Methods	ILO's																					
	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	d1	d2	d3
Lectures	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Tutorial / Practical sections		√					√						√		√			√					
Self-learning			√							√			√										
Assays and reviews			√			√			√			√		√	√								
Discussion groups																				√	√	√	
Brainstorming		√		√				√	√				√					√	√				
Blended-learning																							
E-learning																							

6- Teaching and learning methods for Low-achieving students

- Additional teaching office hours are available for those who need help.
- More assignments to assess their ability to understand the course.
- Encourage teamwork among those students and other advanced ones to increase their participation and understanding.

7- Student assessment

Assessment method	Time	Grade weight (%)	Week	ILOs
Course Work (Tutorial Exercise and Assignments)	**Through the semester**	15	Every Week	a1, a9, b1, b3, b4
Quiz 1	**Through the lecture**	5	Week#4	b2, b3, b4,c1,c3
Mid-term exam	**1 hours**	15	Week#7	a1- a6, b1,b2 c1, c2
Quiz 2	**Through the lecture**	5	Week#11	a3: b3, c2, c4
Final Written exam	**2 hours**	60	Week# 15-16	a1- a7, b1, b5, c1- c5

8-List of references

8.1. Student notebooks:

- Comprehensive instructor notes ("PowerPoint slides") are available on the course web page ("Google Classroom")

8.2. Essential textbooks:

- ***Kendall, K. E., & Kendall, J. E.*** *(2020).* Systems analysis and design *(10th ed.).* *Pearson.*
- **Dennis, A., Wixom, B. H., & Roth, R. M.** (2018). *System analysis and design* (7th ed.). Wiley.

8.3. Recommended textbooks:

- **Satzinger, J. W., Jackson, K. W., & Burd, S. D.** (2020). *Systems analysis and design in a changing world* (8th ed.). Cengage Learning.

8.4. Journals, Periodical and Reports ……..etc.

8.5. Websites

- https://www.tutorialspoint.com/systems_analysis_and_design/index.htm

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