**Course Description Form**

Description of the location

---

This course description provides a concise summary of the main course features and the learning outcomes expected

of the student, demonstrating whether the student has made the most of the available learning opportunities.

It must be linked to the program description.

---

| | |
|---|---|
| .1 Educational institution | Shatt al-Arab University |
| .2 Scientific Department/Center | Department of Computer Science |
| .3 Course Name/Code | Systems Analysis and Design 204CS |
| 4. Available forms of attendance | mandatory |
| .5 Semester/Year | First semester 2024-2025 |
| 6. Number of study hours (total) | 150 hours |
| .7 Date this description was prepared | 2024-2025 |

8. Course objectives

This course aims to provide students with the concepts, processes, and tools of systems analysis and design, and to learn new techniques

and methods for developing systems more effectively and efficiently. Students learn that all information systems projects go through four phases:

planning, analysis, design, and implementation. All projects require the analyst to gather requirements, model business needs, and develop
.
plans for how to build the systems. All projects also require an understanding of organizational behavior concepts such as change management

and team building.

9. Course outcomes, teaching, learning and assessment methods.

A- Cognitive objectives

This course aims to introduce students to the fundamentals of database management systems. It also seeks to develop their practical skills by working with the professor and classmates on a real-world project involving actual interaction and information gathering from a real organization. This is achieved through open discussions, enhancing students' technical and collaborative skills.

**Topics covered by the course:**

.1 Data, information, and file system

.2 Databases and database users

.3 Concepts of database systems and their structure .4 Data modeling using entity-relationship diagram (ERD)

.5 The relational model of the database and relational constraints .6 Functional functions and normalization in relational databases

.7 Relational algebra .8 Relational database design: converting ER models to a relational model

9. Organizing records within files

10. Storing data on disks, basic file structures, and hashing

11. Defining Schemas, Constraints, Queries, and Views Using SQL

12. Acquire skills by using some functions of the MS Access program.

B-Skill objectives of the course

This course aims to provide students with a set of practical and technical skills related to the analysis and design of database systems, the most prominent of which are:

Skills acquired by students:

.1 **Systems Analysis Skills**
- The ability to analyze the needs of organizations and transform them into executable information systems requirements.
- Distinguish between the stages of the system life cycle (planning, analysis, design, implementation) and apply them practically.

.2 **Data modeling skills**
- Create and interpret entity-relationship diagrams (ERDs) and convert them to a relational model.
- Use relational algebra and relational models to understand relationships between data.

.3 **Database Design Skills** - Apply the concepts of functions and normalization to improve the efficiency of databases.
- Design effective relational databases based on real business requirements.

.4 **SQL language skills**
- Write SQL queries to create, manage, and join tables.
- Execute complex queries, views, and constraints within the database.

5. **Software Tools Skills** - Practical application of database building skills using MS Access or similar programs.
- Organizing and storing records and data using hashing techniques and file structures.

.6 **Communication and teamwork skills**
- Develop the ability to collect requirements from stakeholders within a real organization.
- Developing collaborative skills through open discussions and group work with colleagues and under the supervision of the professor.

| Teaching and learning methods |
| --- |

**•Theoretical lectures:**

It is used to introduce basic concepts related to systems analysis, database design, and data models, with a comprehensive explanation of theoretical topics.

Using presentations and real-life examples.

**• Open class discussions:**

It encourages students to think critically and analyze problems related to real work environments, and it also contributes to the development of communication skills.

**•Practical projects:**

Students are assigned to complete a group or individual project with a real organization or a real-world project that simulates actual work,

including requirements gathering, ERD modeling, and database design.

**• Practical training using the computer (Sessions Lab on-Hands)**

Laboratory sessions are held during which design concepts are applied, tables are created, and queries are executed using tools such as MS Access or

MySQL.

**Case studies:**

Analyzing realistic scenarios of problems in systems and database analysis and design, and deriving appropriate solutions for them.

**•Student presentations:**

Students are required to give presentations on a portion of the project or case study, enhancing presentation skills and artistic expression.

| Evaluation methods |
| --- |

**- Cups -**

**Reports** -

**Midterm and final exams**

D - General and transferable skills (other skills related to employability and personal development).

.1 **Effective communication skills**

-

While discussing the project with colleagues Develop the ability to express technical ideas clearly, orally and in writing.

And supervisors.

- Improving listening skills and understanding others' points of view during group work and interviews with stakeholders.

The truth.

2. **Problem-solving and decision-making skills**

- Develop the ability to analyze complex problems associated with the proposed system and provide logical, feasible solutions.

For application.

-

Make data-driven decisions when designing a system or determining the appropriate

database structure.

**.3 Teamwork skills**

- Enhancing the spirit of cooperation and effective participation in accomplishing collective work and achieving common goals.
- Managing conflicts and organizing roles within the team to complete the project efficiently.

**4. Research and self-analysis skills**

- Use a variety of sources to collect and analyze information, and evaluate the suitability of proposed models to the real environment.
- Enhance critical thinking and the ability to evaluate one's own and colleagues' technical work with the goal of continuous improvement.

**.5 Ability to adapt to change**

- Dealing with new challenges and changing requirements through flexibility in thinking and design.
- Understanding the basic principles of change management within organizations when implementing new systems.

**6. Time management and task management skills**

- Good project planning, task allocation, and adherence to deadlines.
- Balance theoretical and practical requirements to achieve the best possible results during the semester.

**7. Readiness for the labor market**

- Preparing students to gain real-world experience through an interactive project with a real institution.
- Enhancing readiness for professions that require skills in systems and database analysis and design, such as systems analyst, database developer, and information systems designer.

10. Course structure

| Learning method | the topic | Hours Required Learning Outcomes | | The week |
|---|---|---|---|---|
| | Introductory lecture + discussion | Introduction to Systems Analysis: Systems Analyst System Development Life Cycle (SDLC) Steps to build an information system for the basic stages in the SDLC | | First week |
| | Project Analysis Case Study | Planning and Analysis: Objectives Steps Outputs | | The second week |
| | System Design Workshop | To design and implement: Objectives Steps | | The third week |

| | | Outputs | | |
|---|---|---|---|---|
| | Lecture and group discussion | For the design of the methodology: (SSADM)<br><br>Waterfall technique<br><br>parallel technology<br><br>Advantages and disadvantages | | Fifth week |
| | RAD Applications | RAD Rapid Application Development:<br><br>Phased development technique<br><br>Advantages and disadvantages | | Week 6 |
| | Practical beach using a model<br><br>miniature | Prototypes:<br><br>Actual models and their<br><br>advantages and disadvantages | | The seventh week |
| | Agile Project Status Presentation | For Agile Development:<br><br>Extreme Programming (XP)<br><br>Advantages and disadvantages | | The eighth week |
| | (play-Role) | Choosing the right development<br><br>approach Team roles and skills: Business Analyst | | Week 9 |
| | group activity | Definition and analysis of roles:<br><br>Systems Analyst<br><br>Infrastructure Analyst<br><br>Change Management Analyst<br><br>project manager | | The tenth week |
| | Practical lecture | project management:<br><br>Determine the size of the project<br><br>Estimating system size using function points<br><br>(Function Points) | | Week 11<br><br>ten |
| | Group exercises | Estimates:<br><br>Estimating effort and time<br><br>Practical exercises | | The second week<br><br>ten |
| | Actual project analysis | Create and manage a business plan:<br><br>Define tasks<br><br>Work Breakdown Structure (WBS) | | The thirteenth<br><br>week |
| | Practical training | For timelines:<br><br>Gantt chart<br><br>PERT chart | | Fourth week<br><br>ten |

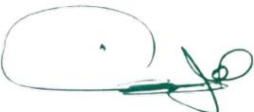| System Analysis Design UML Version 2. An Object-Oriented Approach 3rd Edition, Alan Dennis | 11. Required infrastructure prescribed books-1 |
|---|---|
| System Analysis Design UML Version 2. An Object-Oriented Approach 3rd Edition, Alan Dennis | Main References (Sources) 2 |
| | A(Recommended books and references) scientific journals, reports, etc. |

| 12. Curriculum Development Plan |
|---|

The development plan for this course aims to keep pace with technical and educational developments in the field of information systems and databases, and to meet the requirements of the labor market, through:

**First: Developing academic content**

1. **Updating theoretical and practical topics** to include the latest concepts in databases, such as:

- Non-relational databases (NoSQL)
- Cloud and decentralized databases

2. **Introducing modern topics** related to cybersecurity in databases and Big Data management.

Dean of the College

Head of Department

The material is the teacher