

Course Syllabus

1.	Course title	Introduction to Database Systems
2.	Course number	1902223
3.	Credit hours (theory, practical)	3 hours
	Contact hours (theory, practical)	3 hours /week
4.	Prerequisites/corequisites	Data structures (1901231)
5.	Program title	Computer Information Systems
6.	Program Code	2
7.	Awarding institution	The University of Jordan
8.	School	King Abdullah II School for Information Technology
9.	Level of Course	Undergraduate
10.	Year of study and semester (s)	Second year - all semesters
11.	Final Qualification	B.Sc.
12.	Other department (s) involved in teaching the course	None
13.	Language of Instruction	English
14.	Teaching methodology	<input type="checkbox"/> Blended <input checked="" type="checkbox"/> Online
15.	Electronic platform(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams <input type="checkbox"/> Skype <input type="checkbox"/> Zoom <input type="checkbox"/> Others:.....
16.	Date of production/revision	5 th December 2020
17.	Required/ Elective	Required

18. Course Coordinator:

Dr. Marwan Al-Tawil
Office: KASIT, Third floor (322)
m.altawil@ju.edu.jo

19. Other instructors:

Prof. Fawaz Al-Zaghoul
Dr. Esra Al-Zaghoul

20. Course Description:

The course objectives are to provide students with an overview of database management system architecture and environment, an understanding of the basic database design and implementation techniques, and a practical experience of designing and building a relational database. Other objectives of this course are to make the student able to discuss and explain the importance of the data, the difference between file management and database. Furthermore, it enables applying conceptual design methodologies for databases and learning about the architecture and environments of the database management system (the Ansi-Sparc model). It also enables the student to design and evaluate suitable security and integrity levels for database schemas. This course requires a practical training which is assessed by producing small individual and group projects.

I- Aims:

The course aims to teach students the basic database design and implementation techniques, and a practical experience of designing and building a relational database. Students will have the opportunity to practice and implement applications in the lab.

II- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to achieve the following learning outcomes:

A. Knowledge and understanding:

- A1. Discuss/ explain the importance of data.
- A2. Discuss/ explain the difference between file management and database.
- A3. Design a suitable database components and environments.
- A4. Formulate the major constructs of relational DB language SQL.

B. Intellectual Skills: with ability to

- B1. Employ analytical skills as appropriate during database design and manipulation process.
- B2. Enhance the per-existing database design, development and manipulation process.
- B3. Design and implement a practical database system. In particular, be able to discuss, explain and apply the relational model and mappings from conceptual designs, in particular, normalizations.
- B4. Identify a range of DB-solutions and critically evaluate them and justify the proposed design and development solutions.
- B5. Analyze a wide range of database design issues and provide solutions through suitable designs, structures, diagrams, and other appropriate design methods.
- B6. Be able to apply and evaluate suitable database security and integrity levels.

C. Subject Specific Skills: With ability to

- C1. Use appropriate database design structures, forms and reports.
- C2. Use the (DBMSs) scientific literature effectively.
- C3. Give technical database presentations suitable for time, place, and audience.
- C4. Prepare and deliver coherent and structured verbal and written technical reports.
- C5. Be aware of the health and safety of real world computer DB information systems.
- C6. Plan and undertake a major small individual/ group projects.

D. Transferable Skills: with ability to

- D1. Display an integrated approach to the deployment of communication skills.
- D2. Work effectively with database owners and for database users.
- D3. Strike the balance between self-reliance and seeking help when necessary.
- D4. Display personal responsibility by working for multiple deadlines in relation to the course requirements.

ABET Students Outcomes (SOs):

- 1- Analyze a complex computing and to apply principles of database design and other relevant technologies to identify and deploy real-life solutions.
- 2- Design and implement database solutions to meet a given set of system requirements.
- 3- Support the delivery, use, and management of database information systems within an information systems environment.

Mapping ILOs to ABET SOs

ILOs	ABET SOs
A1, A2, A3, A4	1
B1, B2, B3, B5, B5, B6	2
D1, D2, D3, D4	4

21. Topic Outline and Schedule (based on 12 weeks from 11th Oct 2020 to 4th Jan2021):

Topic	ILOs	Week	Lecture ID	Lecture Content	Learning Methods/ Platforms	TLA
Introduction	A1, A2	1	1.1	Welcome and orientation	Synchronous (MS-Teams)	Lectures, Exams
			1.2	Importance of Database Systems	Synchronous (MS-Teams)	
			1.3	Database models including the ER model	Synchronous (MS-Teams)	
Entity Relationship Model and ER-Mapping	A3, A4, B1, B2, B3, B4 and B5	2	2.1	ER-Diagram and Design Issues	Synchronous (MS-Teams)	Lectures, Exams, and Tasks
			2.2	Weak Entity Sets	Synchronous (MS-Teams)	
			2.3	Reduction to Relational Schema	Asynchronous (Recorded)	
			2.4	Revision	Asynchronous (Recorded)	
		3	3.1	Map Regular and Weak Entities	Synchronous (MS-Teams)	
			3.2	Map Binary and Unary Relationships	Synchronous (MS-Teams)	
			3.3	Map EER	Asynchronous (Recorded)	
			3.4	Mapping EER examples	Asynchronous (Recorded)	

Normalization	B5 and B6	4	4.1	Introduction to Normalization	Synchronous (MS-Teams)	Lectures, Assignment, Exams
			4.2	Functional Dependencies	Synchronous (MS-Teams)	
			4.3	1 st and 2 nd Normal Forms	Synchronous (MS-Teams)	
			4.4 Saturday	Normalization examples	Asynchronous (Recorded)	
		5	5.1	3 rd Normal Form	Synchronous (MS-Teams)	
			5.2	Normalization Examples	Synchronous (MS-Teams)	
			5.3	Practical Task	Asynchronous (Practical Task)	
			5.4 Saturday	Download MySQL database	Asynchronous (Recorded)	
Basic DDL and DML	B6, C1, C2 and C3	6	6.1	Download MySQL and MySQL Workbench	Synchronous (MS-Teams)	Lectures, Assignment, Exam
			6.2	DDL Structure and Commands	Synchronous (MS-Teams)	
			6.3	DDL Commands Examples	Synchronous (MS-Teams)	
			6.4	DDL Practice	Asynchronous (Recorded)	
		7	7.1	DML Commands	Synchronous (MS-Teams)	
			7.2	DML Commands Examples	Asynchronous (Recorded)	
			7.3	Midterm Exam on 25th Nov 2020 Includes all material to DML (Lec 7.2)		
Basic SQL	C4, C5, and C6	8	8.1	Basic Query Structure	Synchronous (MS-Teams)	Practical Tasks, exam
			8.2	Cartesian Product and Natural Join	Synchronous (MS-Teams)	
			8.3	Renaming and String operations	Asynchronous (Recorded)	
			8.4 Saturday	SQL Practice	Asynchronous (Recorded)	
		9	9.1	Set operations	Synchronous (MS-Teams)	
			9.2	Aggregate Functions	Synchronous (MS-Teams)	
			9.3	Nested subqueries	Synchronous (MS-Teams)	
			9.4 Saturday	SQL Practice	Asynchronous (Recorded)	
Intermediate SQL, advanced SQL, Project Discussions	C6, D1, D3, D4	10	10.1	Set Comparison (some, all, not exists)	Synchronous (MS-Teams)	Practical Tasks, exam
			10.2	Subqueries in From and Where Clauses	Synchronous (MS-Teams)	
			10.3	Join Operations	Synchronous (MS-Teams)	

		11	11.1	Views, Integrity Constraints	Synchronous (MS-Teams)	
			11.2	Indexes, Authorizations	Asynchronous (Recorded)	
			11.3	Linking SQL with a programming Language	Synchronous (MS-Teams)	
		12	12.1	Define SQL Functions and procedures	Synchronous (MS-Teams)	
			12.2	Project Discussions	Synchronous (MS-Teams)	
			12.3	Project Discussions	Synchronous (MS-Teams)	
Final Exam Weeks 13 – 14.						
(Please mention instructors per topic if the course topics are being taught by more than one instructor)						

22. Evaluation Methods and Course Requirements (Optional):

<p>Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:</p> <p>30% Midterm exam 15% Project 5% Assignments 50% Final exam</p>

23. Course Policies:

<p>A- Attendance policies: Maximum allowable absence 15% of number of Lectures/Semester</p> <p>B- Absences from exams and handing in assignments on time: It is the student's responsibility to ensure that he/she is aware of all assignments, announcements and contents of missed sessions. It is the student's responsibility to ensure that he/she is aware of all assignments, announcements and contents of missed sessions. Students who miss the midterm exam session will not be able to retake the exam unless provided with an emergent excuse or a medical problem that can be proved by the hospital papers. Only then, the instructor have the right to accept or refuse the excuse given by the student and hence the procedure will be taken as specified by the university regulations.</p> <p>C- Health and safety procedures: University Regulations</p> <p>D- Honesty policy regarding cheating, plagiarism, misbehavior: It is the student's responsibility to ensure that he/she is adhere with cheating, plagiarism, misbehavior</p>
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E- Grading policy + Weighting (i.e. weight assigned to exams as well as other student work)

0-44 F 45-49 D- 50-54 D 55-59 D+

60-64 C- 65-69 C 70-74 C+ 75-78 B-

79-83 B 84-86 B+ 87-89 A- 90-100 A

The grading policy is subject to change at the end of the semester according to the overall performance of students.

F- Available university services that support achievement in the course:

Computer Labs

G- Statement on Students with disabilities

Students with Disabilities: Students with disabilities who need special accommodations for this class are encouraged to meet with the instructor and/or their academic advisor as soon as possible. In order to receive accommodations for academic work in this course, students must inform the course instructor and/or their academic advisor, preferably in a written format, about their needs no later than the 4th week of classes.

24. Required equipment:

1. Laptop.

2. MySQL Database

3. MySQL Workbench

3. Java or Python

25. References:

A- Required book (s), assigned reading and audio-visuals:

Silberschatz, Korth and Sudarshan, "**Database System Concepts**", 7th edition, McGraw Hill, 2019.

B- Recommended books, materials, and media:

1. Elmasri R. and Navathe S. B., "Fundamentals of Database Systems", 5th edition, ISBN 0-201542633), Addison Wesley, 2006.

2. Thomas Connolly et. al., "Database Systems, A Practical Approach to Design, Implementation and Management", Addison Wesley, 1996.

3. Gary Hansen and James Hansen, "Database Management and Design", Prentice Hall, 2nd edition, 1996.

4. Mc Fadden and Hoffer, "Database Management", The Benjamin Cummings, 3rd, 1991.

5. Date C.J, "An Introduction to Database System", Addison- Wesley, 6th 1995.

6. David Kroenke, "Database Processing, Fundamentals, Design, and Implementation", Prentice Hall, 6th, 2000.

7. Ralph Island, "Database Management, Developing Application Systems Using ORACLE", Prentice Hall, 1989.

8. Judith et al., "The Practical SQL Handbook", Addison Wesley, 1997.

9. Jeffrey Ullman and Jennifer Widon, "A First Course in Database Systems", Prentice Hall, 1997.

10. Date C. J. and Hugh Darwen, "A Guide to the SQL Standard", 4th edition, Addison Wesley, 1997.

11. Philip Lewis, Arthur Bernstein and Michael Kifer, "Database and Transaction Processing – An Application-Oriented Approach", Addison Wesley, 2002.

26. Additional information:

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Date:

Name of Course Coordinator: Dr. Marwan Al-Tawil Signature: -----

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- Signature: -----

Copy to:

Head of Department

Assistant Dean for Quality Assurance

Course File