



مركز الاعتماد  
وإضمان الجودة  
ACCREDITATION & QUALITY ASSURANCE CENTER



**The University of Jordan**

**Accreditation & Quality Assurance Center**

**Course Syllabus**

**Advanced Database Systems**

1	Course title	Advanced Database Systems
2	Course number	1902423
3	Credit hours (theory, practical)	3 hours /week
	Contact hours (theory, practical)	3 hours /week
4	Prerequisites/corequisites	Introduction to Database Systems (1902223)
5	Program title	Computer Information Systems
6	Program code	2
7	Awarding institution	The University of Jordan
8	Faculty	King Abdullah II School for Information Technology
9	Department	Computer Information Systems
10	Level of course	Fourth Year
11	Year of study and semester (s)	Spring 2018/2019
12	Final Qualification	B.Sc.
13	Other department (s) involved in teaching the course	None
14	Language of Instruction	English
15	Date of production/revision	9 <sup>th</sup> March, 2019

#### 16. Course Coordinator:

Dr. Omar Al-Adwan  
KASIT 2<sup>nd</sup> Floor  
Email: adwanoy@ju.edu.jo

#### 17. Other instructors:

None

#### 18. Course Description:

This course covers advanced aspects of database management systems including advanced normalization and denormalization, Database recovery, object-oriented and object-relational databases, concurrency control, transaction management, data integration (e.g., semistructured data and XML). Students will undertake a semester project that involves the design and implementation of a database system.

**19. Course aims and outcomes:**

<p><b>A- Aims:</b></p> <p><b>At the completion of this course, students should be able to do the following:</b></p> <p><b>Understand basic database concepts, including the structure and operation of the relational data model, Construct simple and moderately advanced database queries using Structured Query Language (SQL), Understand Relational Algebra, Design and implement an advanced database project, Understand the concept of a database transaction and related database facilities, including concurrency control, journaling, backup and recovery, and data object locking and protocols, Briefly describe and discuss selected advanced database topics, such as distributed database systems and the data warehouse., And Understand the role of the database administrator.</b></p> <p><b>B- Intended Learning Outcomes (ILOs): Upon successful completion of this course students will be able to</b> ...</p>
<p><b>A-Knowledge and understanding:</b></p> <p>A1) Discuss/ explain the structure and advanced operation of the relational data model.  A2) Understand the Relational algebra operations( Basic and advanced)  A3) Design a suitable database components and environments.  A4) Discuss/ explain the essential concepts and major principles relevant to the professional and ethical responsibilities of being a developer, in particular, database security and integrity  A5) Understand the impact of DBMS on the individual, organizational and society levels</p>
<p><b>B-Intellectual Skills: with ability to</b></p> <p>B1) Identify and be able to use recent and advanced database techniques(concurrency control, buffer management, and recovery  B2) Analyze Basic and Advanced Normal forms (up to BCNF)  B3) Analyze and optimize Query and transactional code.  B4) Manipulating indexes.  B5) Analyze/describe and use other models than the relational such as O-O model and semistructured model.</p>
<p><b>C-Subject Specific Skills: With ability to</b></p> <p>C1) Use appropriate database design structures, forms and reports using different database tools.  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.</p>
<p><b>D-Transferable Skills: with ability to</b></p> <p>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.</p>

**20. Topic Outline and Schedule:**

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Revision and impact of DBMS	1	Omar Al-Adwan	A1, A3, A5	Assignment	Textbook and lecture notes
Normalization	2	Omar Al-Adwan	A1,B2	Exam and	Textbook and

Relational Algebra	3,4	Omar Al-Adwan	A2	Exam and Assignment	Textbook and lecture notes
Indexing and Hashing	5,6	Omar Al-Adwan	A1,A3,B4	Exam and Assignment	Textbook and lecture notes
Query Processing	7	Omar Al-Adwan	A1, A3, B3	Exam and Assignment	Textbook and lecture notes
<b>Midterm exam</b>					
Query Optimization	8	Omar Al-Adwan	A1, A3, B3	Exam and Assignment	Textbook and lecture notes
Transactions	9	Omar Al-Adwan	A1, A3, B3	Exam and Assignment	Textbook and lecture notes
Recovery Systems	10	Omar Al-Adwan	A1, A3, B1	Exam and Assignment	Textbook and lecture notes
Concurrency Control	11,12	Omar Al-Adwan	A1, A3, B1	Exam and Assignment	Textbook and lecture notes
Other Models	13	Omar Al-Adwan	A1, A4, B5	Exam and Assignment	Textbook and lecture notes
Training example and revision	14,15	Omar Al-Adwan	A5, C1-C6, D1-D6	Project	lecture notes
Project Discussion	16	Omar Al-Adwan	C1-C6, D1-D6	Project	

## 21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

Lectures  
 Practical Training ( ASP.Net and MySQL)  
 Coding and written Assignment  
 Project

## 22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Midterm exam : 30%  
 Assignment : 10%  
 Project: 10%  
 Final Exam: 50%

## 23. Course Policies:

A- Attendance policies:

Maximum allowable absence 15% of number of Lectures/Semester(Equivalent to 7 Classes)

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.

C- Health and safety procedures:

University Regulations

D- Honesty policy regarding cheating, plagiarism, misbehavior:

It is the student's responsibility to ensure that he/she is adhere with cheating, plagiarism, misbehaviour. Plagiarism is not allowed under any circumstances

E- Grading policy:

The following is a suggested scale which is subject to change according to the students' performance during the course:

<b>0-44 → F</b>	<b>45-49 → D-</b>	<b>50-53 → D</b>	<b>54-57 → C-</b>	<b>58-61 → C</b>	<b>62-65 → C+</b>
<b>66-69 → B-</b>	<b>70-74 → B</b>	<b>75-79 → B+</b>	<b>80-84 → A-</b>	<b>85-100 → A</b>	

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

Computer Labs

## 24. Required equipment:

Computer Lab

Datashows

MySQL

ASP.Net

## 25. References:

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

Silberschatz, Korth and Sudarshan, "Database System Concepts", 6th edition, McGraw Hill, 2014.

### 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.

**C- Online Course Site Every student should visit the following site (for announcements, home works)** Site address: <http://elearning.ju.edu.jo>

**26. Additional information:**

Name of Course Coordinator: -----Signature: ----- Date: -----

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