

**Jerash University**

**Faculty of Computer Science and Information Technology**

**Computer Sciences Department**

**Semester**: Fall Semester 2018/2019

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| **Course symbol and number: 1002342** | **Course Name: قواعد بيانات متقدمة** |
| **Teaching Language:** English | **Prerequisites:** 1002341. |
| **Credits:** 3 hours**.** | **Course Level:** 400 |

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| **Course Description** |
| This module builds on the introductory module in databases. It intends to introduce more advanced topics in databases such as data mining and data warehousing, distributed databases and client server architecture after introducing the DBMS implementation. |

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| **Course Objectives** |
| This module aims to give students in depth information about system implementation techniques, data storage, representing data elements, database system architecture, the system catalog, query processing and optimization, transaction processing concepts, concurrency control techniques, database recovery techniques, database security and authorization, enhanced data models for advanced applications, temporal databases, deductive databases, database technology for decision support systems, distributed databases and client server architecture, advanced database concepts, and emerging technologies and applications. |

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| **Learning Outcomes** |
| students should be able to:  - Apply normalization techniques.  - Understand how transactions are processed in a database.  - Discuss/explain the concepts of Distributed Databases and Data Warehousing.  - Discuss/explain some database security issues.  - Discuss/explain the different techniques in Concurrency Control.  - Tune and Optimize some Database Applications. |

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|  | **Text Book(s)** |
| **Title** | [Fundamentals of Database Systems](https://newmail.just.edu.jo/owa/redir.aspx?C=c6b6690e76984d17b8fe228a8dedafd5&URL=http%3a%2f%2fwww.cit.just.edu.jo%2flabreg%2flab%2fsignup.aspx) |
| **Author(s)** | Elmasri, R. and Navathe |
| **Publisher** | Thomson |
| **Year** | 2010 |
| **Edition** | 7th  Edition |

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|  | **References** |
| **Books** | * **Database System Concepts (Sixth Edition) by Avi Silberschatz, Henry F. Korth, S. Sudarshan .**   **Database Management Systems, (Third Edition), by Raghu Ramakrishnan and Johannes Gehrke. McGraw Hill, 2003**  **Database Systems: The Complete Book (2nd edition),Hector Garcia-Molina, Jeffrey Ullman and Jennifer Widom, Prentice Hall, ISBN 0-131-87325-3, 2008**  **Database Systems: A Practical Approach to Design, Implementation, and Management. Thomas Connolly and Carolyn Begg. Addison Wesley, 5th edition, ISBN 0-321-52306-7, 2009.**  **Oracle Database 11g SQL and PL/SQL: A Brief Primer.** |
| **Internet links** | http://www.jpu.edu.jo/lms |
| **Course link** | [Click here](http://www.jpu.edu.jo/lms) |

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|  | **Instructors** |
| **Instructor** | Dr..Bassam Mohammed El-zaghmouri |
| **Office Location** | الطابق السابع - 709 |
| **Office Phone** | 189 |
| **E-mail** | [b.elzaghmouri@jpu.edu.jo](mailto:b.elzaghmouri@jpu.edu.jo) |

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| **Topics Covered** | | | |
| **Topics** | **Chapters in Text** | **Week number** | **Teaching hours** |
| **Review:** DBMS Data modeling SQL | Chapter 1-4 | 1-2 | 6 |
| **Models :** Relational Model - DRC and TRC  Historical Models - Appendix C, D   * Network Model * Hierarchical Model   Logic/Deductive  OODBMS  XML and semistructured | Chapter 5-7 | 3-4 | 6 |
| **Logical Design :** Properties of a good design  Functional dependencies and keys  Normal forms: 3NF, BCNF, 4NF  Decomposition algorithms | Chapter 10-11 | 5-6 | 6 |
| **Physical Data Organization :** Relational structures: heap, sorted, compressed  Indexes: primary and secondary, B-trees | Chapter 14 | 7 -8 | 6 |
| **Query Optimization:** Heuristic (logical) optimization  Cost-based (physical) optimization | Chapter 15 | 9-10 | 6 |
| **Concurrency Control:** ACID Serializability  Two-phase locking . | Chapter 18 | 11-12 | 6 |
| **Recovery :** System log Undoing and redoing | Chapter 19 | 13 | 3 |
| **Security:** Roles Properties | Chapter 23 | 14 | 3 |
| **Future Topics :** XML ,Data warehousing  Data mining | Chapter 27-29 | 15 | 6 |

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|  | **Evaluation** |  |
| **Assessment Tool** | **Expected Due Date** | **Weight** |
| Programming assignments and LMS |  | 20 % |
| First Exam |  | 20 % |
| Second Exam |  | 20 % |
| Final Exam | According to the University final examination schedule | 40 % |

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|  | **Policy** |
| **Attendance** | Attendance is very important for the course. In accordance with university policy, students missing more than the allowed absence rate of total classes are subject to failure. Penalties may be assessed without regard to the student's performance. Attendance will be recorded at the beginning or end of each class. |
| **Exams** | All exams will be CLOSE-BOOK; necessary algorithms/equations/relations will be supplied as convenient. |

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| **Class Schedule & Room** |

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| **Office Hours** |
| Sun: 8 – 9:30  Mon: 9:30-11  Tues: 11- 12:30  Wed: 11 – 12:30 |

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|  | **Teaching Assistant** |
| To announced later on. |  |

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|  | **Prerequisites** |
| **Prerequisites by course** | 1002341 |