

**College of Information Technology**

**Department of Information Technology**

**COURSE SYLLABUS/ SPECIFICATION**

**Course Code & Title: ITCS 435 - Database Administration II**

**Weight: (2-2-3)**

**Prerequisite: ITCS 336**

**NQF Level Allocated: Level 8**

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| **NQF Notional Hours / Credits:**  **120 notional hours/ 12 NQF credit**  |

**Description:** This course provides students with critical knowledge and advanced training on diagnostic resources, globalization support, managing resources, flashback databases and recovering from user errors. It also provides details on maintaining and management of memory as well as automating tasks with the scheduler.

**Objective:**

1. To diagnose and repair data failures with Flashback technology.
2. To manage space and optimize database storage in response to growing space requirements.
3. To monitor and manage major database components, including memory, performance and resources.
4. To secure the availability of Oracle database through appropriate backup and recovery strategies.
5. To automate DBA tasks with the scheduler.

**Semester:**

**Instructor:**

**Office Telephone: Email (s):**

**Intended Learning Outcomes (ILOs):**

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| 1. **Knowledge and Understanding**
 | **NQF Descriptor/ Level** |
| **A1** | **Concepts and Theories:** Recognize critical concepts and principles of the most important responsibilities a DBA has, like: performing backup and recovery as well as automating tasks via the scheduler. | Knowledge: theoretical understanding[Level 8] |
| **A2** | **Contemporary Trends, Problems and Research:**  | N/A |
| **A3** | **Professional Responsibility:**  | N/A |

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| 1. **Subject-specific Skills**
 | **NQF Descriptor/ Level** |
| **B1** | **Problem Solving:** Show ability to manage and optimize database storage, diagnose and repair data failure, perform backup and data recovery as well as use the scheduler to automate different tasks. | Knowledge: Practical Application [Level 8] Skills: Communication, ICT & Numeracy[Level 8] |
| **B2** | **Modeling and Design:**  | N/A |
| **B3** | **Application of Methods and Tools:** Apply specialized tools while monitoring, diagnosing and securing Oracle database; such as Recovery Manager (RMAN) command-line and enterprise manager, Data Recovery Advisor (DRA) and Automatic Diagnostic Repository (ODR). | Knowledge: Practical Application [Level 8] Skills: Communication,ICT & Numeracy [Level 8] |

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| 1. **Critical-Thinking Skills**
 | **NQF Descriptor/ Level** |
| **C1** | **Analytic skills:** Critically evaluate the various tools of configuring, managing, monitoring, diagnosing and securing an Oracle database and choose the appropriate tools for a given situation. | Generic Problem Solving& Analytical skills[Level 8] |
| **C2** | **Synthetic:** | N/A |
| **C3** | **Creative Thinking and innovation:**  | N/A |

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| 1. **General and Transferable Skills (other skills relevant to employability and personal development)**
 | **NQF Descriptor/ Level** |
| **D1** | **Communication:** The ability to express and communicate critical ideas related to data base administration in oral and written form. | Communication, ICT and Numeracy Skills[Level 8] |
| **D2** | **Teamwork and Leadership:**  | N/A |
| **D3** | **Organizational and Developmental Skills:** Demonstrate ability to organize ideas and effectively allocate time in a given assignment. | Competence: Autonomy, Responsibility andContext [Level 8] |
| **D4** | **Ethics and Social Responsibility:**  | N/A |

**Course Structure (Outline)**

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| **Week** |  **Hours**  | **ILOs** | **Unit/Module or Topic Title** | **Teaching Method** | **Assessment****Method** |
| **Lec.** | **Lab** |
| 1 | 2 | 2 | A1 | Introduction and syllabus distribution. | Lecture |  |
| 2 | 2 | 2 | A1, B1, B3 | * Core Concepts and Tools of the Oracle Database
* Configuring for
* Recoverability
 | Lecture/ Class Discussion/ In-Lab Supervised Work | In-Lab Exercises |
| 3 | 2 | 2 | A1, B1, B3 | * Using the RMAN Recovery Catalog
* Configuring Backup Settings
 | Lecture/ Class Discussion/ In-Lab Supervised Work | In-Lab Exercises/ Quiz1 |
| 4 | 2 | 2 | A1, B1, B3, C1 | * Creating Backups with RMAN
* Restore and Recovery Task
 | Lecture/ Class Discussion/ In-Lab Supervised Work | In-Lab Exercises |
| 5 | 2 | 2 | A1, B1, B3, C1, D1, D3 | * Using RMAN to Perform Recovery
* Monitoring and Tuning RMAN
 | Lecture/ Class Discussion/ In-Lab Supervised Work | In-Lab Exercises/ Assignment 1 |
| 6 | 2 | 2 | A1, B1, B3, C1 | Diagnosing the Database | Lecture/ ClassDiscussion/ In-LabSupervised Work | In-Lab Exercises |
| 7 | 2 | 2 | A1, B1,B3 | Using Flashback Technology I | Lecture/ Class Discussion/ In-Lab Supervised Work | In-Lab Exercises |
| 8 | 2 | 2 | A1, B1, B3 | Using Flashback Technology II | Lecture/ ClassDiscussion/ In-LabSupervised Work | In-Lab Exercises |
| 9 | 2 | 2 | B1, B3, C1 | Performing Flashback Database | Lecture/ ClassDiscussion/ In-LabSupervised Work | Lab Test |
| 10 | 2 | 2 | A1, B1, B3, C1 | * Managing Memory
* Managing Database
* Performance
 | Lecture/ ClassDiscussion/ In-LabSupervised Work | In-Lab Exercises |
| 11 | 2 | 2 | A1, B1, B3, C1 | * Managing
* Performance by SQL Tuning
* Managing Resources
 | Lecture/ Class Discussion/ In-Lab Supervised Work | In-Lab Exercises/ Quiz 2 |
| 12 | 2 | 2 | A1, B1, B3, C1 | Automating Tasks with the Scheduler | Lecture/ ClassDiscussion/ In-LabSupervised Work | In-Lab Exercises |
| 13-14 | 4 | 4 | A1, B1, B3, C1, D1, D3 | * Managing Space in
* Blocks
* Managing Space in
* Segments
* Managing Space for the Database
 | Lecture/ Class Discussion/ In-Lab Supervised Work | In-Lab Exercises/ Assignment 2 |
| 15 | 2 | 2 | A1, B1, B3, C1 | Duplicating a Database | Lecture/ ClassDiscussion/ In-LabSupervised Work | In-Lab Exercises |
| 16 | 2 | - | A1,B1,C1 | All Topics |  | Final Exam |

**Teaching Materials:**

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| **Textbook(s):** | Oracle Database 11g Database Administration |
| **Handout(s):** | Oracle Learning Library available through:<http://www.oracle.com/technetwork/tutorials/index.html>Available on Moodle i.e. <http://www.ahlia.edu.bh/moodle> |
| **Reference(s):** | 1. Gehani N. and Annamalai M.(2013) *The Database Book – Principles and Practice using the Oracle Database System,* Universities Press.
2. Greenwald R., Stackowiak R. and Sterns J. (2007) *Oracle Essentials: Oracle*
3. *Database 11g,* Fourth Edition, O’Reilly Media.

Website: [http://www.oracle.com](http://www.oracle.com/) |

**Assessments:**

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| **Type of****Assessment** | **Description** | **ILOs** | **Weighting** |
| **Assignments** | The students will be given 2 research based assignments each worth 10 marks and their total will be considered at the end. | A1, B1, C1, D1, D3 | 20% |
| **Quizzes** | The purpose of the quiz is to assess the students’ knowledge and understanding of the topics covered in the course like managing and optimizing database storage, diagnosing and repairing data failure, Performing backup and recovery as well as automating tasks via the scheduler. Students will be given two quizzes, each one is 30 minutes, and the best one will be considered. | A1, B1, C1 | 10% |
| **Lab Test** | The knowledge and practical skills of students will be evaluated throughout practical test that will be of 90 minutes. It will cover topics discussed in the first 9 weeks. | B1, B3, C1 | 30% |
| **Final Exam** | The final exam is comprehensive and will be of two hours duration. It will consist of multiple choice questions, fill in the blank, short-answer and few essay questions. | A1, B1, C1 | 40% |
| **In-Lab Exercises** | Each of the In-Lab exercises consists of a set of practical tasks to be carried by the students during lab time and that will help in evaluating hands-on capability of the students. | B1, B3, C1 | Formative |
| **Overall** |  |  | **100%** |

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| **Admissions** |
| **Minimum number of students** | 5 |
| **Maximum number of students** | 20 |

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| **Ahlia University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see** [www.ahlia.edu.bh/integrity](http://www.ahlia.edu.bh/integrity) **for more information).** |