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| Syrian Arab Republic |  الجامعة الافتراضية السورية SYRIAN VIRTUAL UNIVERSITY | الجمهورية العربية السورية |
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Course Definition File

1- Basic Information:

| | |
|--|----------------------------------|
| Course Name | Advanced database administration |
| Course ID | iis406 |
| Contact Hours (Registered Sessions) | 36 |
| Contact Hours (Synchronized Sessions) | 18 |
| Mid Term Exam | Non |
| Exam | 75 min |
| Registered Sessions Work Load | 36 |
| Synchronized Session Work Load | 18 |
| Credit Hours | 6 |

2- Pre-Requisites:

| Course | ID |
|-------------------------|--------|
| Database administration | ITD420 |
| | |

3- Course General Objectives:

Student should learn in this course, how to backup, restore and recover oracle database, and the tools we can use to do these tasks.

The main topics of this course:

- RMAN concepts, backup and configuration.
- Recovering non critical losses.
- Complete and incomplete recovery.
- Incomplete recovery.
- Flashback technology
- Dealing with user errors.
- Dealing with database corruption.
- Managing restore points.

4- Intended Learning Outcomes (ILO):

| Learning | Learning Outcomes |
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|----------|-------------------|

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| Outcomes codes | |
|----------------|---|
| LO1 | Understanding concepts related to database backup, restore and recovery. |
| LO2 | RMAN tool basics. |
| LO3 | How to use RMAN to backup database, and backup types available in RMAN. |
| LO4 | Understanding incremental backup, and how to do it using RMAN. |
| LO5 | RMAN configuration. |
| LO6 | How to recover from noncritical losses, and most common errors in database. |
| LO7 | How to perform complete recovery in Oracle. |
| LO8 | Incomplete recovery types and how to perform it. |
| LO9 | Flashback technology and the key benefits of it. |
| LO10 | How to use flashback to recover from user errors. |
| LO11 | How to deal with database corruption, detecting analyzing and recovering. |
| LO12 | How to use restore points, and rewind database to a certain time in the past. |

5- Course Syllabus (18 hours of total synchronized sessions)

| LO | Course Syllabus | Recorded Sessions | Synchronized Sessions | Type | Additional Notes |
|-----|--|-------------------|-----------------------|---|------------------|
| LO1 | Introduction <ul style="list-style-type: none"> Backup. Database archive mode. Recovery concept in oracle. Redolog sequences. Multiplexing redolog files. Multiplexing control file. RMAN. Parameter file backup. Control file backup. Instance startup stages. | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Others | |
| LO2 | RMAN concepts: <ul style="list-style-type: none"> RMAN overview. RMAN terminology. | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars | |

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| | <ul style="list-style-type: none"> Starting RMAN. RMAN related initialization file parameters. Connection types with RMAN RMAN configuration. | | | <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> Others | |
| LO3 | RMAN backup: <ul style="list-style-type: none"> RMAN commands Channel allocation. Backup command. Constraints. Parallelization. Backup types. Backup data files. Backup archived redolog files. Whole database backup. Using tags. Backup options. | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Others | |
| LO4 | RMAN incremental backup: <ul style="list-style-type: none"> Incremental backup. Block change tracking. Updating backups. RMAN List command. RMAN Report command. | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> Others | |
| LO5 | RMAN configuration: <ul style="list-style-type: none"> Configuring the environment for RMAN backup. Configuring Flash recovery area. Configuring the backup retention policy. Backup optimization. Configuring archived redolog files deletion policy. Advanced backup options. | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Others | |
| LO6 | Recovering from noncritical losses: <ul style="list-style-type: none"> Recover temporary tablespace Recover a redo log group member | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Others | |

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| | <ul style="list-style-type: none"> Recover index tablespace Recover read-only tablespace Re-create the password file | | | | |
| LO7 | Complete recovery: <ul style="list-style-type: none"> Recovery concept and steps. Identifying data files to restore or recover. Determining the DBID of the database. Backups used in restore operations. Validating backups before restoring. Restoring archived redo log files needed for recovery. Performing complete database recovery. | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> Others | |
| LO8 | Incomplete recovery: <ul style="list-style-type: none"> Incomplete Recovery overview. Situations Requiring Incomplete Recovery. Types of Incomplete Recovery. UNTIL TIME recovery Example. Incomplete database recovery using RMAN. | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Others | |
| LO9 | Flashback technology: <ul style="list-style-type: none"> Flashback Database architecture Enable and disable the Flashback Database Monitor the Flashback Database | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input checked="" type="checkbox"/> Others | |
| LO10 | User errors: <ul style="list-style-type: none"> Flashback dropped tables. Managing the recycle bin. Querying Dropped Tables. Flashback versions query. | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices | |

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| | <ul style="list-style-type: none"> Transaction level recovery using flashback transaction query. Flashback table. | | | <input type="checkbox"/> Others | |
| LO11 | Database corruption: <ul style="list-style-type: none"> Causes of database corruption. Detecting database corruption. How to handle corruptions. Block Media Recovery (BMR). | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> Others | |
| LO12 | Restore points: <ul style="list-style-type: none"> Understand Flash back restore points. Guaranteed restore points. Using normal and guaranteed restore points. | 1 | 1 | <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> Assignments <input checked="" type="checkbox"/> Seminars <input checked="" type="checkbox"/> Projects <input type="checkbox"/> Practices <input type="checkbox"/> Others | |

6- Assessment Criteria (Related to ILOs)

| LO Code | LO | Intended Results | Assessment Type | | | | |
|---------|------------------------------------|------------------|--|----------|-------|--|---------|
| | | | Interactive Synchronized Collaboration | Practice | Exams | Presentations And Face-to-Face Assessments | Reports |
| LO1 | Introduction | | X | X | X | | X |
| LO2 | RMAN concepts | | X | X | X | | X |
| LO3 | RMAN backup | | X | X | X | | X |
| LO4 | RMAN incremental backup | | X | | X | | |
| LO5 | RMAN configuration | | X | | X | | |
| LO6 | Recovering from noncritical losses | | X | X | X | | X |
| LO7 | Complete recovery | | X | | X | | |
| LO8 | Incomplete recovery | | X | X | X | | X |
| LO9 | Flashback technology | | X | X | X | | X |

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| LO10 | User errors | | X | X | X | | X |
| LO11 | Database corruption | | X | X | X | | X |
| LO12 | Restore points | | X | X | X | | X |

7- Practice Tools:

| Tool Name | Description |
|-----------|-------------|
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8- Main References

- 1- Oracle Database 10g: Administration Workshop II, Edition 2.0
- 2- <https://docs.oracle.com>

3- Additional References

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