COURSE OUTLINE

Course Number: IST 264
Course: Database Administration II
Credits: 4

Co- or Pre-requisite: IST 263
Implementation: Fall 2019

Catalog description (2017-2018 Catalog): [Note: All revisions to the course description in the catalog require the submission of a memo to the Curriculum Committee.]

Database Administration II combines training, experience, and testing to ensure that students have a strong foundation and expertise in the industry’s most advanced database management system. Students will learn an Oracle database configuration for multilingual applications; the Oracle Recovery Management and Flashback technology; and Database performance monitoring tools.

Is course New, Revised, or Modified? [Modified courses are those which have a new prefix or course number]
Revised

Required texts/other materials:
Textbook: Database Administration II Packages from Oracle Corporation.

Revision date: September 09, 2019

Course coordinator: Queen E. Okike-Iroka, Ed.D.
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Information resources: (Describe the primary information resources that support the course, including books, videos, journals, electronic databases, websites, etc. To request new materials for your course, use the library request form at: www.mccc.edu/student_library_course_form.shtml).

The request form was completed on February 28, 2019.

Other learning resources: (Describe any other student learning resources that are specific to this course, including any special tutoring or study group support, learning system software, etc.)
None
Course Competencies/Goals
The student will be able to:

1. Explain the Database Architecture and ASM
2. Configure database for recoverability use the RMAN Recovery Catalog
3. Configure Backup Specifications and use RMAN to Create Backups
4. Perform user-Managed Backup and Recovery
5. Use RMAN to Perform Recovery and use RMAN to Duplicate a Database
7. Diagnose Database problems; Monitor and Tune RMAN
8. Use Flashback Technology, Flashback operations and diagnose the database problems
9. Manage memory, space, database performance, resources
10. Automate tasks with the Schedule, administer the Scheduler and explore globalization

Course-specific General Education Knowledge Goals and Core Skills.

- **General Education Knowledge Goals**
  - **Goal 1. Communication.** Students will communicate effectively in both speech and writing.
  - **Goal 2. Mathematics.** Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.
  - **Goal 4. Technology.** Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

- **MCCC Core Skills**
  - **Goal A. Written and Oral Communication in English.** Students will communicate effectively in speech and writing, and demonstrate proficiency in reading.
  - **Goal B. Critical Thinking and Problem-solving.** Students will use critical thinking and problem solving skills in analyzing information.
  - **Goal C. Ethical Decision-Making.** Students will recognize, analyze and assess ethical issues and situations.
  - **Goal D. Information Literacy.** Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.
  - **Goal E. Computer Literacy.** Students will use computers to access, analyze or present information, solve problems, and communicate with others.
  - **Goal F. Collaboration and Cooperation.** Students will develop the interpersonal skills required for effective performance in group situations.
Course Content Details

Unit 1

Database Architecture and ASM.

Learning Objectives
The student will be able to:

- Describe Automatic Storage Management (ASM) (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Set up initialization parameter files for ASM and database instances (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E,F.)
- Start up and shut down ASM instances (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Administer ASM disk groups (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Configure multiple archive log file destinations to increase availability (Course Competencies 1, General Education Goals 1, 2, 4; Core Skills A, B, D, E,F.)
- Define, apply and use a retention policy (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E,F.)
- Configure the Flash Recovery Area (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)

Unit 2 Use the RMAN Recovery Catalog.

Learning Objectives
The student will be able to:

- Identify situations that require RMAN recovery catalog (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Create and configure a recovery catalog (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Synchronize the recovery catalog (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Create and Use RMAN stored scripts (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Back up the recovery catalog (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)

Unit 3 Use RMAN to create Backups Configure.

Learning Objectives
The student will be able to:

- Create image file backups (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Create a whole database backup (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Enable fast incremental backup (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Create duplex backup and back up backup sets (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)

• Create an archival backup for long-term retention (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Create a multisession, compressed and encrypted backup (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Report on and maintain backups (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

**Unit 4** Perform User-Managed Backup and Recovery.

*Learning Objectives*

*The student will be able to:*

• Recover from a lost TEMP file (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Recover from a lost redo log group (Course Competencies 1, 2; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Recover from the loss of password file (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Perform user-managed complete database recovery (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Perform user-managed incomplete database recovery (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Perform user-managed and server managed backups (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Identify the need of backup mode (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Back up and recover a control file (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Using RMAN to Perform Recovery (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

**Unit 5** Use RMAN to Duplicate a Database.

*Learning Objectives* The student will be able to:

• Use RMAN to Duplicate a Database (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Create a duplicate database (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Use a duplicated database (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Perform Tablespace Point-in-Time Recovery (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)

• Identify the situations that require TSPITR (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4 Core Skills A, B, D, E, F.)
• Perform automated TSPITR (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Monitor and Tune RMAN (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Monitor RMAN sessions and jobs (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Configure RMAN for Asynchronous I/O (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Use Flashback Technology (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Restore dropped tables from the recycle bin (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Perform Flashback Query and use Flashback Transaction (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)

Unit 6  
Diagnose the Database.

Learning Objectives The student will be able to:
• Set up Automatic Diagnostic Repository (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Using Support Workbench (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Perform Block Media Recovery (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Implement Automatic Memory Management (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Manually configure SGA parameters (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Configure automatic PGA memory management (Course Competencies 1, 3, 4; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Use and manage optimizer statistics (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Use and manage Automatic Workload Repository (AWR) (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Use advisory framework (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
• Manage Alerts and Thresholds (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
Unit 7  Manage Memory Space and Database Performance.

**Learning Objectives** The student will be able to:

- Managing Database Performance (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Use the SQL Tuning Advisor (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Use the SQL Access Advisor to tune a workload (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Manage presumable space allocation (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Reclaim wasted space from tables and indexes by using the segment shrink functionality (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Understand Database Replay (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)

Unit 8  Manage Resources; Automate tasks with the Schedule; administer the Scheduler and explore globalization.

**Learning Objectives**

The student will be able to:

- Understand the database resource manager (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Create and use Database Resource Manager Components (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Create a job, program, and schedule (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Use a time-based or event-based schedule for executing Scheduler jobs (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Create lightweight jobs (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Use job chains to perform a series of related tasks (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Create Windows and Job Classes (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Use advanced Scheduler concepts to prioritize jobs (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Customize language-dependent behavior for the database and individual sessions (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
- Administering the Scheduler (Course Competencies 1, 2; General Education Goals 1, 2, 4; Core Skills A, B, D, E, F.)
**Evaluation of Student Learning**

Average of weekly homework assignments  
50%

Four Units of Tests:
- Unit 1 & 2  
  10%
- Unit 3 & 4  
  10%
- Unit 5 & 6  
  10%
- Unit 7 & 8  
  10%

Final Examination  
10%

Total  
100%

**Structure of Evaluation:**

1. Hands-on laboratory assignments.
2. Multiple choice Unit tests.
3. Hand-on unit tests.

**Grade Policy**

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<tr>
<th>Grade</th>
<th>Definition</th>
<th>Nominal %</th>
<th>QPA quality point value</th>
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<tbody>
<tr>
<td>A</td>
<td>Superior Achievement</td>
<td>93-100</td>
<td>4</td>
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<tr>
<td>A-</td>
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<td>90-92</td>
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<td>B+</td>
<td></td>
<td>87-89</td>
<td>3.4</td>
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<tr>
<td>B</td>
<td>Above Average Achievement</td>
<td>83-86</td>
<td>3</td>
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<tr>
<td>B-</td>
<td></td>
<td>80-82</td>
<td>2.7</td>
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<tr>
<td>C+</td>
<td></td>
<td>77-79</td>
<td>2.4</td>
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<tr>
<td>C</td>
<td>Average Achievement</td>
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<td>D</td>
<td>Minimally Passing</td>
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<td>F</td>
<td>Academic Failure</td>
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<td>X</td>
<td>Audit — no evaluation</td>
<td>N/A</td>
<td>N/A</td>
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<td>W</td>
<td>Withdrawal (Student-initiated)</td>
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<td>WI</td>
<td>Withdrawal (Instructor-initiated)</td>
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<td>N/A</td>
<td>N/A</td>
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<tr>
<td>N</td>
<td>No grade reported by the instructor</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete — no credit earned</td>
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<td>N/A</td>
</tr>
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</table>

**Audit:**

If you audit the course, you will receive an “X” grade—this cannot be changed to a letter grade at a later date.
**Withdrawal Course Requirements:**
To receive a W grade for any course, a student must consult with the course instructor or an appropriate division representative and then withdraw officially before two-thirds of the course has been completed by submitting a withdrawal form to the Office of Student Records. Withdrawal after this point results in a grade other than W (usually F). At any time before two-thirds of the course has been completed, the instructor may also withdraw with a W grade any student who has been absent excessively. A student thus withdrawn will not be entitled to any refund of tuition or fees. The student may appeal this action.

**Academic Integrity Statement:** [Include a statement affirming the college’s Academic Integrity policy and any specific implications for the course. See [http://mlink.mccc.edu/omb/OMB210.pdf](http://mlink.mccc.edu/omb/OMB210.pdf)]