RARITAN VALLEY COMMUNITY COLLEGE
COMPUTER SCIENCE (CS) DEPARTMENT

CISY-294, Oracle: Database Administration Fundamentals Part I

I. Basic Course Information

A. Course Number and Title:

CISY-294, *ORACLE: Database Administration Fundamentals Part I*

B. Date of Proposal: November 2006

C. Course Developers: Stephen Brower and Pratap Reddy

D. Sponsoring Department: Computer Science (CS) Department

E. Semester Credit Hours: 3

F. Weekly Contact Hours: 4 (2, 2)

G. Prerequisite: CISY 286 *Intro to Oracle: SQL & PL/SQL* or permission of instructor

H. Laboratory Fees: Yes, at current rate

II. Catalog Description

(Prerequisite: CISY 286 Intro to Oracle: SQL & PL/SQL or permission of instructor) This course is designed to give future Oracle database administrators (DBAs) a firm foundation in basic database administrative tasks. Students will gain a conceptual understanding of the Oracle database architecture and how the architectural structures work and interact with one another. Students will also learn how to create an operational database and properly manage the various structures in an effective and efficient manner in order to have a well-designed and operational database.

III. Statement of Course Need

This course prepares students for entry-level positions in Oracle Database administration. A vast majority of professional Relational Database Developers use Oracle as the tool of choice for database deployment. Database Administrators need to design and implement Databases that can be effective repositories of critical company information.

Oracle University offers five courses that are required for individuals that want Oracle DBA certification. The first course, *Introduction to Oracle: SQL and PL/SQL*, is already offered by RVCC under the same name. This is through the Oracle Academic Initiative. The second course that Oracle offers is called Oracle 9i DBA Fundamentals I. This course, *ORACLE: Database Administration Fundamentals Part I*, would mirror Oracle University's course.

IV. Place of Course in College Curriculum

Required for following programs:

- Database Certificate – Oracle Emphasis

- C.I.S. Elective
- Free Elective

V. Outline of Course Content

- Oracle Architectural Components
  - Understanding the physical structure
  - Understanding the memory structure
  - Understanding the process structure
  - Understanding the logical structure
  - Outlining the stages of an SQL statement
  - Defining an Oracle Database, the Oracle server, and the Oracle Instance
- Getting Started with the Oracle Server
  - Identifying database administrative tools
  - Identifying the features of the Universal Installer
- Managing an Oracle Instance
  - Creating, managing, and using initialization files: PFILE and SPFILE
  - Identifying the various states of starting an instance
  - Identifying the various options available to shutdown an instance
  - Monitoring Alert and Trace files
- Creating a Database

    - Using the Database Configuration Assistant to create a database
    - Creating a database manually
- Using the Data Dictionary
    - Identifying the uses and contents of the data dictionary
    - Using the data dictionary to obtain information about the database
- Maintaining the Control File
    - Explaining the uses of the control file
    - Listing the contents of the control file
- Maintaining Redo Log Files
    - Explaining the use of online redo log files
    - Explaining the structure of online redo log files
- Managing Tablespaces and Data Files
    - Outlining the database storage hierarchy
    - Identifying the types of tablespaces
- Storage Structure and Relationships
    - Outlining the various segment types and their uses
    - Outlining the storage clause precedence
- Managing Undo Data
    - Understanding the purpose of undo data
    - Managing undo data
- Managing Tables
    - Outlining the various Oracle data types
    - Explaining the two types of ROWID formats
- Managing Indexes
    - Classification of types and uses indexes
    - Creating b-tree and bitmap indexes
- Maintaining Data Integrity
    - Identifying the various types and states of constraints
    - Implementing data integrity constraints
- Managing Password Security and Resources
    - Managing passwords using profiles
    - Administering profiles
- Managing Users
    - Defining database schema and objects
    - Creating new database users
- Managing Privileges and Roles
    - Identifying system and object privileges
    - Granting and revoking privileges
- Using Globalization Support
    - Choosing character set and national character set for a database
    - Specifying the language-dependent behavior

VI. Educational Goals and Learning Outcomes

General Education Goals

At the conclusion of the course, students will be able to:

1. Describe in a clear and logical manner how to create an operational database and properly manage the various structures (G.E. 2)

2. Apply knowledge of other disciplines and creativity to problem solving; decision making; and quantitative reasoning. (G.E. 1, 4, 7)

Learning Outcomes

At the conclusion of the course, students will be able to:

1. Describe the main components of the Oracle database architecture and how they interact with one another

2. Design, develop and test an operational database using appropriate database design tools

3. Describe and demonstrate how to manage Oracle tablespaces and their corresponding files

4. Describe and demonstrate how to manage Oracle database users, privileges and resources

5. Start up and shut down an Oracle instance and database

VII. Modes of Teaching and Learning

- Lecture - Lecture with demonstration of configuring Oracle and creation/management of Database, users, security roles, tablespaces etc.
- Laboratory – Lab time to create, configure and manage databases.

VIII. Papers, Examinations, and other Assessment Instruments

- Labs - In-class assignments
- Computer Projects – In-class and out of class projects
- Exams – Exams and Hands on exams

IX. Grade Determinants

- Labs
- Projects
- Exams
- Final Exam and/or Final Project

X. Textbook: Suggestions

Oracle Database 10g DBA Handbook, Kevin Loney, Bob Bryla , McGraw-Hill Osborne Media, 2005

Oracle Database 10g: The Complete Reference, Kevin Loney, McGraw-Hill Osborne Media, 2004

XI. Resources

- Latest version of Oracle on a Windows , Solaris, or UNIX Server capable of handling 25 concurrent user sessions
    - If using Windows Server then *UNIX Services for Windows*, and *VIM(vi Improved)* also needed
- Workstations with network access inside RVCC's firewall
- Telnet on workstation
- Internet Explorer on workstation
- Annual membership in Oracle Academic Initiative for at least 25 concurrent user licenses

Note: RVCC is currently a member of the Oracle Academic Initiative with 75 concurrent user licenses. Being a member allows RVCC to advertise the class with Oracle in the title and RVCC is entitled to the latest version of Oracle for the server