# Marquee image: Harvard Extension School shield on decorative paper

# CSCI E-67

# Oracle Database Administration

# Spring 2019

# Course Syllabus

# [This should be considered a working syllabus; the general flow, assignments and areas covered are good. I am reworking the whole course, so I may make some structure changes and when a topic is covered may change. There are two major assignments that can take significant focused time. There are more assignments that will take less time. There will be discussion topics and research topics as we go along (probably weekly). I will provide all the reading material. There will be a lot of reading, but it will be focused and with intension.]

Students in this course will develop an understanding of the internal structures and organization of an Oracle database.

The course will present a framework approach to the planning, building, tuning, and monitoring of an Oracle18c and an Oracle 12c database.

Students will create their own Oracle database, including tablespaces, user accounts, views, indexes, and other objects necessary to support an application. They will use this database for the duration of the class and complete a number of exercises using this database.

This database will be built on an AWS instance. Students will also create an Oracle RDS database.

They will use a framework approach on how to manage, secure and provide ongoing support to the environment.

Prerequisites for this course include an understanding of the principles of a relational database model and a working knowledge of SQL. Knowledge of the UNIX operating System will be helpful. CSCI E-60 or equivalent.

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| Session 1       Jan 30th Introduction to being a Database Administrator. What types of DBA exist?  Review the course content.  Examine the basic architecture of an Oracle Database implementation.  Assignment 0: This is a set of basic technology questions |
| Session 2        Feb 6th Review the overall architecture of an Oracle installation. What is the OFA (optimal flexible architecture) standard?  Examine the logical database design and relate it to the physical database layout.  Assignment 1:  Set of short questions (due next week)  Discussion Topic Session 3         Feb 13th Take a system level view of an installation, the background processes and memory structures  Complete an installation of the Oracle RDBMS. Take into consideration the environment variables needed.  Operating System issues and kernel parameters. Examine the use of virtual and cloud based servers or services  Assignment 2: Set of short questions (due next week)  Discussion Topic |
| Session 4         Feb 20th How to create a database.  Creation scripts. What procedures should be run and why.  The parameter file, what is it and why is it so important. Locally Managed Tablespaces.  Review some of the more important parameters.  Assignment 3:  Create database (due in 2 weeks) |
| Session 5       Feb 27th What are storage parameters, extents and segments? How does Oracle store data?  Review the function and design of Undo segments.  Examine the creation of database objects, tables and indexes.  Assignment 3:  Create database (due next week)  Discussion Topic |
| Session 6         March 6th Object Storage and related issues. Examine how data is stored at the lowest level.  Understand how to network the Oracle environment using SQL\*Net  What is an Oracle Internet Directory?  Assignment 4:  Set of short questions (due next week)  Discussion Topic |
| Session 7         March 13th Mid-Term Exam. (Open Book – No proctor required)  (This may change; it may be another assignment and we hold a lecture) ( I am holding this option open) |
| Spring Break March 17th thru 23rd |
| Session 8         March 27th Now that we have a database environment, what are our daily tasks? What does a DBA do, day to day?  How do we Move/Copy a database?  How do we upgrade to the next version of the Oracle RDBMS?  How do we add a patch to the RDBMS?  These are questions you are sure to be asked ask a DBA. We will examine these questions and work though some examples.  Assignment 5:  Discussion Topic |
| Session 9         April 3rd Examine the use of Oracle Enterprise Manager. How do we use it to manage large scale environments?  Assignment 6:  10 Short Questions (due next week) **Discussion Topic** |
| Session 10       April 10th A database may fail due to hardware failures, like disks or a CPU. It may also fail due to software bugs or even due to human error. You will need a good backup to recover. This session will cover some of the backup options and methods of recovery  We have a backup strategy in place. What are our recovery options? How can we get back in business as quickly as possible?  Assignment 7: |
| Session 11       April 17th Devops as automation; Devops as a methodology; Agile in a devops world  Where does the database technology stack fit in the new infrastructure as code environments?  Assignment 8: |
| Session 12       April 24thThe System is slow. You will hear this from time to time i. Where do you start? What is performance management? Is it a system problem or a database issue? Is it in the application? We will look at some of the common performance metrics. Discussion Topic |
| Session 13 May 1st Review the creation of users and the general security levels in an Oracle environment.  Oracle provides a number of tools to manage data in a database. These utilities allow us to move data and objects from one user to another. We will examine the exporting and importing of data and objects. |
| Session 14       May 15thWe will review a number of High Availability solutions.Course Review |
| Session 15       May 15th Final Exam or final project (Open Book – no proctor needed) |