BUS 498 - Advanced Database Management Systems

Time: Winter 2013, MW 8:10 – 10:00 and 12:10-2:00
Instructor: Professor Barry Floyd
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Phone: 756-6551
Office Hours: MW: 10:00 to noon, and by appointment

COURSE DESCRIPTION
This course has three components: SQL, Programming with PL/SQL and advanced database concepts including Big Data and data storage (NetApp). The first part of the course will focus on Structured Query Language (SQL) using Oracle 10g as the database platform building on the material presented in BUS 393. A primary outcome of this activity is the preparation for taking (and passing) Oracle’s certification exam on SQL. The second part of the course will focus on developing DB scripts using Programming Language with Structured Query Language (PLSQL) in an Oracle 10g environment. These languages (SQL and PLSQL) are used both in the development and execution of Business Applications as well as the administration of an Oracle Database (e.g., commands to invoke administrative actions are specified in SQL/PLSQL). The secondary outcome of this activity is the preparation for taking (and passing) Oracle’s certification exam on PL/SQL (we will not cover enough of this material to allow you to pass the exam, but if you find this of interest, then you could pursue it as part of a senior project). The final portion of the class will review advanced DB concepts with a focus on Big Data and data storage technologies (NetApp). In addition, you will be given the opportunity to explore one of the aforementioned topics in greater detail or to define a topic of your own interest to study and report to the class.

The course pedagogy will include presentations on key concepts and skills associated with the Oracle platform. In conjunction with our agreement with Oracle, course materials will be drawn from their material presented in their courses. This material will be supplemented to include key conceptual and theoretical material not presented in the Oracle material.

LEARNING OBJECTIVES

- **LO 1.1** Apply knowledge to identify opportunities and solve business problems.
  - Specifically with a focus on solving business problems using technology solutions such as database management systems, data storage technologies, big data, and business intelligence.

- **LO 3.1** Exhibit the ability to work in a diverse environment
  - Diversity comes in many forms. You will be asked to work with others to share knowledge, communicate in classroom discussions, work in teams and make presentations while acknowledging the differences and strengths of others.

- **LO 4.2** Demonstrate effective oral communication skills.
  - You will be asked to effectively express yourself in classroom discussions by speaking knowledgably and with conciseness. You will also be asked to listen carefully to classroom presentations and classroom discussions.

- **LO 4.3** Demonstrate effective participation in teams.
  - Project work will be team based requiring effectiveness in managing team and personal initiatives and taking leadership roles within your team in various capacities.
TEXTS
- Introduction to Oracle10g: SQL Volumes 1, 2, and 3 Published by Oracle Corporation,
- Oracle 10g: Programming with PLSQL Volumes 1, 2 and 3 Published by Oracle Corporation.
- Self Test Software (optional, either SQL, PLSQL or the combined SQL/PLSQL Software)

GRADING
You will receive points for each activity you perform in this class. Your point total will then be evaluated and a letter grade assigned (standard scale). Points will be allocated according to the scheme shown below

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>100</td>
</tr>
<tr>
<td>Exam 2</td>
<td>100</td>
</tr>
<tr>
<td>Labs (20 @ 2 points each)</td>
<td>40</td>
</tr>
<tr>
<td>Quizzes (6 at 10 points each)</td>
<td>50</td>
</tr>
<tr>
<td>Net App labs</td>
<td>10</td>
</tr>
<tr>
<td>Project / Presentation</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
</tr>
<tr>
<td>Passing Oracle SQL exam</td>
<td>50 points added to exam 1</td>
</tr>
<tr>
<td>Passing Oracle PL SQL exam</td>
<td>50 points added to exam 2</td>
</tr>
</tbody>
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LABS
Labs are mandatory. You cannot receive an A in this class unless all (but one) of the labs are done correctly and on time. You may miss two lab submissions by 48 hours and still earn an A. Missing 3 or 4 lab submissions restrict your grade to an A-. Missing 5 or 6 lab submissions restrict your grade to a B+. Missing more restricts your grade to a B. A lab submission is the end of chapter assignments listed. Not remembering announcements made in class about which labs are due is not a valid reason for missing the submission of a lab assignment. A partially complete lab submission does not count as completing the assignment; it counts as a missing assignment. To receive credit for a lab submission, upload your labs to Polylearn one chapter at a time. Please submit your lab in a professional manner. Name your labs clearly in the following format:

lastname_firstname_start_SQL_labnumber.sql for the first part of the class
(e.g., floyd_barry_SQL_1.zip)
lastname_firstname_start_PLSQL_labnumber.sql for the second part of the class
(e.g., floyd_barry_PLSQL_1.zip)

LINKS FOR CERTIFICATION EXAM INFORMATION
SQL Certification Exam Link: http://education.oracle.com/pls/web_prod-plq-dad/db_pages.getpage?page_id=41&p_exam_id=1Z0_051


There are a few weeks where I will be away. These weeks are highlighted. Those students who are interested may work on their projects with students from the University of Potsdam, Germany. If you are interested, please let me know at the beginning of the quarter.
<table>
<thead>
<tr>
<th>Week</th>
<th>Event(s)</th>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
</table>
| 1    | Oracle SQL             | 1/7  | Introduction – Overview  
Oracle Installation  
Oracle SQL: Retrieving data using the SQL SELECT statement (1),  
Restricting and Sorting Data (2) |
|      |                        | 1/9  | Oracle SQL: Using Single-Row Functions to customize output (3),  
Reporting Aggregated Data using the Group Functions (4)  
**Labs due: 1, 2** |
| 2    | Quiz 1, Oracle SQL     | 1/14 | **Quiz 1 over Oracle SQL Ch 1 to 4**  
Oracle SQL: Displaying Data from Multiple Tables (5),  
Using Sub-Queries to Solve Problems (6), Using the Set Operators(7)  
**Labs Due: 3, 4** |
|      | Lecture Online         |      |                                                                     |
|      | Lecture Online         | 1/16 | Oracle SQL: Manipulating Data (8), Using DDL Statements to Create  
and Manage Tables (9), Creating Other Scheme Objects (10)  
**Labs due: 5, 6, 7** |
| 3    | Quiz 2, Oracle SQL     | 1/22 | **NOTE CLASS IS HELD ON TUESDAY**  
**Quiz 2 over Oracle SQL Ch 5 to 9**  
Creating Other Schema Objects(10) (continued)  
SQL Review  
**Labs due: 8, 9** |
|      | Review                 | 1/23 | SQL Review  
**Labs due: 10** |
| 4    | Exam 1                 | 1/28 | **Exam 1: Oracle SQL Ch 1 to 10** |
|      | GAP, Oracle PL/SQL     | 1/30 | Presentation by GAP (8am to 10am section only)  
Noon to 2 class may also attend (classroom may change, bring laptop)  
Oracle PL/SQL: Introduction to PL/SQL (0), Declaring Variables (1),  
Writing Executable Statements (2) |
|      | Quiz 3, Oracle PL/SQL  | 2/4  | **Quiz 3 over Oracle PL/SQL Ch 0 – 2**  
Oracle PL/SQL: Interacting with the Oracle Server (3),  
Writing Control Structures (4)  
**Labs due: 0, 1, 2** |
|      | Lecture Online         |      |                                                                     |
|      | Lecture Online         | 2/6  | Oracle PL/SQL: Working with Composite Datatypes (5),  
Writing Explicit Cursors (6),  
**Labs due: 3, 4** |
| 6       | Quiz 4          | 2/11 | Quiz 4 over Oracle PL/SQL Ch 3 – 6  
|         | Oracle PL/SQL  |      | Advanced Explicit Cursors (7), Oracle PL/SQL: Handling Exceptions (8) Tentative, Creating Database Triggers (16),  
|         |                |      | Labs due: 5, 6  
|         | Oracle PL/SQL  | 2/13 | Oracle PL/SQL: More Trigger Concepts (17)  
|         |                |      | Labs due: 7, 8, 16  
|         |                |      | Pl/SQL Review  
| 7       | 2/18           |      | Academic Holiday  
| 8       | Exam 2         | 2/20 | Lab due: 17  
|         |                |      | Exam 2: Oracle PL/SQL Chapters 0 to 8, 16 to 17.  
| 9       | Quiz 5         | 3/4  | Quiz 5 over storage technologies  
|         | Big Data       |      | Big Data – Handout  
|         |                |      | NetApp labs due  
|         | Big Data       | 3/6  | Big Data - Handout  
| 10      | Quiz 6         | 3/11 | Quiz 6 over Big Data  
|         |                |      | Team Presentations  
|         |                | 3/13 | Team Presentations  
|         |                |      | Project due  

No Final Exam scheduled

Possible Project ideas:
- Do more work with SQL or PL/SQL (I have additional material)
- Build on either Big Data or Data Storage Technologies
- Build a front end to a database using the programming techniques taught in BUS 392.
- Modify your BUS 393 project to include triggers.
- Business Intelligence
- Many others …

Additional Activity: I am working with Net App to schedule a site visit. This is an optional field trip and will likely take place on a Friday. More information will be announced in class.