IST 370
Introduction to Oracle SQL
(New Title: Database Programming with SQL)
Spring 2015

INSTRUCTOR: Dr. Stephen C. Shih
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OFFICE HOURS 9:00 a.m. – 9:30 a.m., Tuesday & Thursday
3:30 p.m. – 5:00 p.m., Tuesday & Thursday

MEETING TIMES / LOCATION
Section 001: 9:35 a.m. – 10:50 a.m. TR / ASA 112C
Section 002: 2:00 p.m. – 3:15 p.m. TR / ASA 112C

TEXTBOOK
ISBN: 978-1-4390-4128-4 (Software Included)

COURSE DESCRIPTION
This course is designed to provide students with pragmatic skills of database programming with Structured Query Language (SQL). Students will learn to create and maintain database objects (e.g., tables and views) as well as insert and manipulate data. Other important topics include basic queries, advanced queries (e.g., subqueries), joining data from multiple tables, and single-row and group functions. Prerequisite: IST 334 (with a grade of C or better).
COURSE OBJECTIVES

Upon successful completion of this course, the student should be able to write and execute the following SQL statements:

1. Create and modify tables
2. Create and modify constraints
3. Insert, update, and delete records in a table
4. Create basic queries using SELECT statements
5. Create single-row and group functions for data retrieval
6. Join data from multiple tables
7. Create subqueries
8. Create views

Desire2Learn (D2L) will be used for both face-to-face and online learning management. It will be used in this class as the primary tool for posting teaching materials and assignments, and in the meantime, for conveying necessary communications among students as well as dialogues between students and instructor. Use the following link to get access to the SIU Online Site powered by D2L: https://online.siu.edu/

EVALUATIONS

Your grade will be determined by the percentage of the total points you get. The components of the course grade are:

<table>
<thead>
<tr>
<th></th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exams</strong> (400 points)</td>
<td>4 Exams: 100 points per exam</td>
</tr>
<tr>
<td><strong>Lab Assignments</strong> (300 points)</td>
<td>12 lab assignments</td>
</tr>
<tr>
<td><strong>Attendance</strong> (100 points)</td>
<td>Each unexcused absence will lead to a deduction of 5 points (See Attendance Policy for details)</td>
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Grading Scale:

A: 90 % and above; B: 80 - 89 %; C: 70 - 79 %; D: 60 - 69 %; F: Below 60%
# TENTATIVE COURSE OUTLINE

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Subjects</th>
<th>Exams</th>
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</table>
| 1 - 4 | **Introduction**  
**Data Definition Language**  
- Chapter 3 - Table Creation and Management  
- Chapter 4 - Constraints  
**Data Manipulation Language**  
- Chapter 5 - Data Manipulation | **Exam 1** (100 points) – Covers Chapters 3, 4, & 5 |
| 5 – 8 | **Basic SELECT Statements**  
- Chapter 2 - Basic SQL SELECT Statements  
- Chapter 8 – Restricting Rows and Sorting Data | **Exam 2** (100 points) – Covers Chapters 2, 8 & 9 (Part I) |
| 9 - 12 | **More SELECT Statements**  
- Chapter 9 – Joining Data from Multiple Tables  
**Advanced SQL Statements**  
- Chapter 10 – Selected Single-Row Functions | **Exam 3** (100 points) – Covers Chapters 9 (Parts II & III) & 10 |
| 13 - 16 |  
- Chapter 11 – Group Functions  
- Chapter 12 – Subqueries  
- Chapter 13 - Views |  |
| 17 | | **Exam 4 (Final Exam)** (100 points) – Covers Chapters 11, 12, & 13 |
# Detailed List of Course Coverage

- **Table Creation and Management:**
  - CREATE TABLE ...
  - ALTER TABLE ...
  - Renaming/Deleting a Table
  - USER_TABLES, DESC,
  - Table Creation with Subqueries,

- **Constraints**
  - Creating Constraints at the Column Level
  - Creating Constraints at the Table Level
  - Using the PRIMARY KEY Constraint
  - Using the FOREIGN KEY Constraint
  - Using the UNIQUE Constraint
  - Using the CHECK Constraint
  - Using the NOT NULL Constraint

- **Data Manipulation**
  - Inserting New Rows: INSERT INTO ... VALUES
    - Handling Virtual Columns
    - Handling Single Quotes in an INSERT Value
    - Inserting Data from an Existing Table
  - Modifying Existing Rows: UPDATE
    - Using Substitution Variables
  - Deleting Rows

- **Basic SQL SELECT Statements**
  - SELECT...FROM...WHERE
  - Column Aliases
  - Arithmetic Operations
  - NULL Values
  - Concatenation

- **Restricting Rows and Sorting Data**
  - WHERE Clause
    - Comparison Operators
    - BETWEEN . . . AND Operator
    - IN Operator
    - LIKE Operator
    - Logical Operators
• Treatment of NULL Values
  ○ ORDER BY Clause

• Joining Data from Multiple Tables
  ○ Cartesian Joins: (traditional and JOIN methods)
  ○ Equality Joins: (traditional and JOIN methods)
  ○ Non-Equality Joins: (traditional and JOIN methods)
  ○ Self-Joins: (traditional and JOIN methods)
  ○ Outer Joins: (traditional and JOIN methods)
  ○ Set Operators

• Selected Single-Row Functions
  ○ Case Conversion Functions (LOWER, UPPER, INITCAP, etc.)
  ○ Character Manipulation Functions (SUBSTR, INSTR, etc.)
  ○ Number Functions (ROUND, TRUNC, etc.)
  ○ Date Functions (MONTHS_BETWEEN, etc.)
  ○ Datatype Conversion Functions (TO_CHAR, etc.)
  ○ Other Functions (NVL, NVL2, NULLIF, CASE, the DUAL table, etc.)

• Group Functions
  ○ SUM, AVG, COUNT, MAX, MIN
  ○ Grouping Data: GROUP BY ... HAVING
  ○ Restricting Aggregated Output
  ○ Nesting Functions
  ○ Statistical Group Functions (STDDEV, VARIANCE)
  ○ Enhanced Aggregation for Reporting (GROUPING SETS, CUBE, ROLLUP)

• Subqueries and MERGE Statements
  ○ Single-Row Subqueries (in WHERE, HAVING, SELECT clauses)
  ○ Mutiple-Row Subqueries
  ○ IN, ALL, ANY Operators

• Multiple-Column Subqueries
• NVL and IS NULL in Subqueries
• Correlated Subqueries
• Nested Subqueries

This syllabus is a living document and is subject to change.
POLICIES

Attendance

Attendance is MANDATORY for all students. The attendance will be taken 5 - 10 minutes after the class starts. **Note that those who are not present throughout the *entire* class session (i.e., arriving late for more than 15 minutes or leaving early) will be deemed as absent.**

A **100-point attendance credit** is given to each student at the beginning of the semester. Each unexcused absence will lead to a **deduction of 5 points** unless there is a documented illness or emergency.

The absent student will be responsible for the materials, assignments and/or announcements missed.

Students may be granted emergency or planned excused absences under the following circumstances:

- **Emergency Excused Absences:** For an emergency excused absence, the student must contact the instructor to obtain approval. Students may be granted emergency excused absences under special circumstances, such as personal illness (a doctor’s excuse is needed if the student is away for 2 days or longer) or death or serious illness of a close family member.
- **Planned Excused Absences:** For a planned excused absence, the student must contact the instructor at least one week prior to the start of the course regarding the absence. You may be granted planned excused absences when involving in a scholarly activity (e.g., making an academic presentation at a regional or national conference). Time away from class must be minimal and, preferably no more than 2 days. Planned excused absences are not permitted during examination days or project presentation days, except under unusual circumstances.

Academic Dishonesty

All assignments, projects and exams should reflect individual effort. **Any incident of plagiarism or cheating will result in an automatic course failure for *all* involved parties.** All matters pertaining to academic dishonesty will be dealt with according to School, College and University guidelines.

**Statement on Academic Honesty/Plagiarism** – See the Morris Library Guide on Plagiarism ([http://libguides.lib.siu.edu/plagiarism](http://libguides.lib.siu.edu/plagiarism))

As defined by the SIUC **Student Conduct Code**, acts of academic dishonesty include, but are not limited to:

1. **Plagiarizing** or representing the work of another as one’s own work;
2. Preparing work for another that is to be used as that person’s own work;
3. Cheating by any method or means;
4. Knowingly or willfully falsifying or manufacturing scientific or educational data and representing the same to be the result of scientific or scholarly experiment or research;

5. Knowingly furnishing false information to a university official relative to academic matters;

6. Soliciting, aiding, abetting, concealing, or attempting acts of academic dishonesty.

**Professional Conduct**

Students are expected to conduct themselves in a professional and courteous manner, which includes but is not limited to the following:

- Arrive at class on time.
- Do not leave early unless you have notified the instructor in advance with a legitimate reason.
- Turn off cell phones before entering the classroom.
- Do not do things (e.g., writing e-mails, web surfing, or doing homework assigned in other classes) unrelated to the subjects discussed in class.
- Loud talking or any other inappropriate disruptive behaviors in not allowed in the classroom.
- Be respectful toward your instructor and classmates.

**Email Communication**

Students are responsible for checking the course D2L website frequently.

**ACADEMIC CALENDAR**

**SPRING SEMESTER 2015**

- Martin Luther King, Jr.'s Birthday Holiday: Monday, January 19
- Semester Classes Begin: Tuesday, January 20
- Spring Vacation: Saturday, March 7, 12:00 Noon through Sunday, March 15
- Honors Day: Saturday, April 11
- Final Examinations: Monday, May 11 through Friday, May 15
- Commencement: Saturday, May 16, 2015

All Breaks begin officially at 10:00 p.m. the night before and end at 7:30 a.m. the morning after the respective beginning and ending dates listed, unless otherwise noted.