CS450/550 Database Concepts Syllabus Document

This document contains two syllabi. The first is in the ABET format which is relatively uninformative for students. The second is the syllabus given to students in the course. The second is actually a form. They are required to initial the several sections of the syllabus and type in their name to signify that they have read the syllabus. The form is due early in the semester.
ABET Syllabus CS450 Database Concepts

1. Course number and name **CS 450 Database Concepts**
2. Credits and contact hours **3 credits** Entirely web-based, no classroom contact. 
   **Nominally 3 hours/week.**
3. Instructor’s or course coordinator’s name **Irwin Levinstein**
4. Text book, title, author, and year
   
   Ramez Elmasri and Shamkant B. Navathe, Fundamentals of Database Systems, seventh edition, 2016. This text is required but previous editions (Ramez Elmasri and Shamkant B. Navathe, Fundamentals of Database Systems, sixth or fifth editions) are adequate.

   a) other supplemental materials. **Students are urged to acquire books on SQL and PL/SQL such as Nilesh Shah, Database Systems Using Oracle 2e. There is a very large website for the course accessed at https://cs450.cs.odu.edu/~cs450/450/latest/ that could be considered supplemental materials.**

5. Specific course information

   a) brief description of the content of the course (catalog description)

   Laboratory work required. Three level database architecture. The relational database model and relational algebra. SQL and its use in database procedures and with conventional programming languages. Entity relationship modeling. Functional dependencies and normalization. Transactions, concurrency and recovery. 3.000 Credit hours 3.000 Lecture hours

   b) prerequisites or co-requisites **Prerequisites: CS 252 (unix) and a grade of C or better in CS 381 (discrete) and either CS 330 (object oriented) or CS 361 (data structures).**

   c) indicate whether a required or elective course in the program **Elective**

6. Specific goals for the course

   a) specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.

   1. Recognize the general purpose and goals of the online course
   2. Identify the overall structure of a database, from the media storage to the presentation of data to the user
   3. Demonstrate proficiency with the basic concepts of the relational database model
   4. Use the operations of relational algebra to solve data retrieval problems
   5. Demonstrate proficiency with basic SQL to solve data retrieval problems
6. Incorporate the use of SQL, as a data sublanguage, with proficiency
7. Develop skills of reading and creating Entity Relationship Diagrams
8. Apply mathematical principles to ensure consistency and integrity in database design
9. Identify problems of transactions in connection with multi-user databases
10. Understand basic database recovery techniques

b) explicitly indicate which of these student outcomes are addressed by the course.

i. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions. **YES**
ii. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program’s discipline. **YES**
iii. Communicate effectively in a variety of professional contexts. **NO**
iv. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles. **NO**
v. Function effectively as a member or leader of a team engaged in activities appropriate to the program’s discipline. **NO**
vi. Apply computer science theory and software development fundamentals to produce computing-based solutions. **To some extent**

7. Brief list of topics to be covered

<table>
<thead>
<tr>
<th>Course Overview and Introduction to Database Concepts and Architecture</th>
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<tbody>
<tr>
<td>The Relational Model and Relational Algebra</td>
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<tr>
<td>SQL—A Relational Database Language</td>
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<td>Embedded SQL (PL/SQL and PHP)</td>
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<td>Database Design—the Entity Relationship Model</td>
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<tr>
<td>Database Design—Functional Dependencies and Normal Form</td>
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<tr>
<td>Transaction Processing Concepts, Concurrency, and Recovery</td>
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</table>
INSTRUCTIONS: Fill in your name and emails above. Read each paragraph and put your initials in each of the boxes printed in the syllabus to indicate that you have read the associated paragraph. If you agree to abide by all of the course requirements, sign your name where indicated by typing it in the blank. If you do not agree, you should drop the course. Return to me by [Syllabus Due Date]. If you do not return it I will not grade your work. If you return it late, you lose 5 points from your final average.

CS4/550 Database Concepts
SYLLABUS [Semester Year]

Instructor: Irwin Levinstein.
Office: None. Please communicate by email or course forums.
Email: all of your email to me for this course should be initiated at web page
https://cs450.cs.odu.edu/~cs450/cgi-bin/email450att.cgi in order to avoid ending up in a spam folder. Since this is an entirely internet based course, all of our communication will be by email or message board.

US Mail: Irwin Levinstein, Computer Science Department, Old Dominion University, Norfolk VA 23529.
Text: Ramez Elmasri and Shamkant B. Navathe, Fundamentals of Database Systems, seventh edition, 2016. This text is required but previous editions (Ramez Elmasri and Shamkant B. Navathe, Fundamentals of Database Systems, sixth or fifth editions) are adequate alternatives. Page and chapter numbers are given for all editions.

While the course includes some instruction in the languages SQL and PL/SQL, students are basically expected to master the material on their own in the course of programming assignments. It is recommended that students find congenial books on the languages to supplement the information provided in the textbook, in course lectures, and on the web. Nilesh Shah, Database Systems Using Oracle 2e has been ordered by the bookstore but is expensive so you may prefer others. Two introductory level books that you might consider are Alice Rischert, Oracle SQL By Example and Benjamin Rosenzweig and Elena Silvestrova Rakhimov, Oracle PL/SQL By Example. Students have also found Michael McLaughlin, Oracle Database 11g PL/SQL Programming, useful, but it does not cover SQL. Whatever book you choose for SQL should be oriented to Oracle SQL which has features differing from standard SQL and provide information on the SQL*PLUS interface for entering SQL commands. The website has links to online references.

Goals: If you get an A in this course, you will be able to explain the basic concepts of database architecture, data storage, and the relational database model. You will be able to express queries in relational algebra, SQL, and ordinary English, and be able to embed SQL queries in PL/SQL and PHP programs. You will be able to design a relational database. You will be able to understand and apply the concepts and techniques of concurrency control and database recovery. If you get less than an A you will have some deficiencies in the above-mentioned areas and be less prepared for those courses for which this course is a prerequisite.

Schedule: The official course schedule is available on the web at
**Cheating:** Students may form groups of up to size 2 to work on Relational Algebra, SQL, PL/SQL and PHP programming assignments as well as the functional dependency assignment and groups of up to size 4 for the graduate student assignment but **must work individually** on all other assignments and homework unless announced in class and/or on the course web page. Graduate students and undergraduate students may not be members of the same group.

If you are part of a group, you may discuss, or get help on, anything to do with that assignment **ONLY** with another group member or the instructor or the TA for the class. If you are NOT part of a group, you may NOT discuss or get help on any aspect of the assignment with anyone except the instructor or TA. Review questions are to be answered without assistance from others. **In no case may you use materials from other students in previous semesters** in the preparation of any work to be submitted. All work to be submitted must be entirely produced by you or your group. Collaborating with others, whether students or not, outside these limits is a violation of the course rules. **Possession of solutions from earlier semesters is also a violation.**

You are expected to **protect your work.** If two students or two groups submit similar work, both will suffer penalties for cheating. Two ways to protect your work are 1) do not put your work in your `secure_html` directory tree and 2) put the following statement in your Linux `.cshrc` or `.bashrc` and `.bash_profile` file: `umask 7`. This gives you permission but no one else to read, write or execute the files you create. From time to time I will attempt to read assignments for this course in your Unix (Z Drive) account. If I am able to read them, that demonstrates that you are making your work available to others to copy. You will be warned and thereafter penalized if I find that you have not corrected the problem.

**Communications:** It is your responsibility to actively seek out course information. You should visit the course web page at least three times a week. You should read your email at your ODU CS account at least four times a week. You are responsible for knowing about all course related matters announced on the web page or via email.
- **email:** to avoid spam filters please initiate all course email at [https://cs450.cs.odu.edu/~cs450/cgi_bin/email450att.cgi](https://cs450.cs.odu.edu/~cs450/cgi_bin/email450att.cgi) (there is a link at the top of the course web page).
- **web page:** [https://cs450.cs.odu.edu/~cs450/450/[url base]](https://cs450.cs.odu.edu/~cs450/450/) To encourage you to read your mail and to visit the web page, requests will be made from time to time for you to respond to certain announcements within a given time. The announcements will be made via email or via the web page or both. If you fail to respond as requested you may lose points from your total course score.

**Grades:** Your grade will be based on **positive points** earned from review questions, several assignments and two examinations and **negative points** earned by failing to complete self-assessments or surveys, failing to respond to email and web page requests for a response, late submissions, or failing to protect your work as described above. The review questions altogether will count as one assignment. The assignments will count 60% of the **positive points** of your grade. The examinations will count 40% of the **positive points** of your grade. Both exams will be curved. Some assignments may be curved as well. The final score will not be curved. Grading scale: [0-60): F; [60-68.5): D; [68.5-70): D+; [70-78.5): C; [78.5-80): C+; [80-88.5): B; [88.5-90): B+; [90-100]: A. Since the graduate student grade scale does not include any D grade, a D or D+ for a graduate student may be reported as an F. Note: [x-y) means the interval from and including x to but not including y.

**Review Questions:** Review Questions have been assigned for most chapters. They are accessed via the course [Schedule] page. The answers are due by the dates in the schedule. Answers must be submitted via the web forms provided for that purpose. Only one submission is allowed.

You are not to collaborate with others on the review questions. It is a violation of the course rules to do so.
Self-Assessments: Many self-assessments are provided online to aid in understanding the concepts of the course. The self-assessments are accessed via the course [Schedule] page. They are designed so that you can retake them as often as you like. It is your responsibility to complete these self-assessments. You get credited with completing one when you earn a score of 100% and submit it. **If you complete fewer than 90% of the self-assessments, you may have up to one assignment’s worth of points deducted from your course score.** From time to time, self-assessments are added to those initially announced in the schedule. These will be announced on the course web page. It is your responsibility to know about them.

Surveys: Over the course of the semester several surveys will be announced on the course cs450.web site. The announcement will be visible for several days and responses will not be possible after the stated due date. **If you complete fewer than 75% of the surveys, you may have up to one assignment’s worth of points deducted from your course score.** To avoid missing the surveys, you should check the web pages several times a week. Surveys consist of form with a series of questions posted on the course website on cs450.cs.edu. Your responses will be visible to all other students in the course but your name will not be attached to your responses and I will read them without knowing what response came from whom.

Presentations: Most of the material which is presented in online video lectures in the form of PowerPoint™ presentations is available for you in the form of PDF files. You will need a PDF viewer such as Adobe Acrobat Reader™ to view the presentations. The files will be downloadable from the course web page. You will need an unzipping utility such as WinZip™ to retrieve them once they are downloaded.

Videos: High quality videos of virtually the entire lecture portion of the course may be accessed via the course [Schedule] page. You are expected to watch all the videos during the first week of each module.

Assignments: **Students in CS450 will have 4 assignments** in addition to the review questions. The CS450 students’ assignment average will be computed by adding their best assignment grade again to their total assignment grade before dividing by 5 (best grade counts twice). This benefit is not available to students in CS550 whose total assignment grade is simply the average of all assignments. **CS550 students will have 5 assignments.** The level of design and programming in the fifth assignment as well as the first three assignments will go beyond that required of CS450 students. If the assignment grades are ‘curved’ the curve will be more generous for CS450 students than for CS550 students. The assignments are briefly described in the schedule. Total value of the assignments, including review questions: 60% of the positive points of your grade.

Tests: There will be two tests, one at mid-term and one at the end of the semester. The two tests will count equally. Total value of the tests: 40% of your average. The tests be delivered via Blackboard. Tests may be taken at proctored locations that you arrange for or via a proctoring service provided by ODU. You must take the tests when scheduled. **CS550 students will have examination questions which are not required of CS450 students.** If the test scoring is ‘curved’, the curve will be more generous for CS450 students than for CS550 students.

Honor Code: By registering for classes at ODU you have agreed to the following Honor Pledge: *I pledge to support the honor system of Old Dominion University. I will refrain from any form of academic dishonesty or deception, such as cheating or plagiarism. I am aware that as a member of the academic community, it is my responsibility to turn in all suspected violators of the honor system. I will report to Honor Council hearings if summoned.*

Classroom Behavior: As this is an online course, the only issue is online behavior. Politeness is expected in all forums and email correspondence.

Late Material: No late work will be accepted or graded without prior agreement or extenuating circumstances (as defined by the instructor).
Attendance: As this is a distant learning web-based class, there are no class meetings. However you are expected to keep up with the work assigned and to meet all deadlines. You are responsible for knowing everything announced on the course web sites whether you saw it or not. Examinations must be completed on the dates assigned.

Acknowledgement
I have read this syllabus in its entirety and have read carefully the paragraphs marked with boxes. I have initialed each box to indicate that I have read and understood the paragraph next to it. By signing I acknowledge that I agree to abide by the course requirements.

Signed ____________________________

Typing your name above constitutes signing this document and acknowledging that you have read all the parts thereof.