CIS 302 – Relational Database Systems

Cedar Crest College

Fall 2008 *Tony Marasco*

COURSE CONTENT

In this course the student is provided with a solid and practical foundation for the design, implementation, and management of database systems. The foundation is built on the notion that successful database creation depends on the important concepts that define them. This is achieved through a balance of theory and practice. Basic database theories such as normalization and transaction control are discussed in detail. Likewise, Structure Query Language (SQL), the *de facto* language for database communication, is presented.

As mentioned, conceptual data modeling, entity-relationship diagrams, and database normalization procedures are discussed. The course emphasizes applications development and programming techniques with a modern relational database management system. An introduction to object-oriented database system and data warehouse is provided. Students implement a major database application project. Assignments in this course may require programming concepts that the student mastered in other courses. Most assignments will be theoretical in nature; although, applied assignments will be delivered. Fundamentals of computer programming will not be discussed in this class.

The course is instructor-led in a computer laboratory. Laboratory time is scheduled; however, as this class may require extensive research and commitment outside of class. As assignments increase in difficulty increased commitment is required by the student.

CREDIT VALUE

Three (3) credits

TEXTS AND MATERIALS (Title/Edition, Author, ISBN, Publisher)

Database Systems: Design, Implementation, and Management, 7th Ed. – Rob & Coronel
ISBN: 0-418-83593-5, Course Technology
looseleaf notebook
at least two (2) High Density 3½ Diskettes (one for backup), CD-RW, ZIP disk, or USB drive.

COURSE EXPECTATIONS AND OUTCOMES

The objective of this course is to provide students with a sound theoretical and practical foundation in the study of database design.
After completing this course you should be able to:

- Differentiate the concepts of data, information, and knowledge.
- Define a database and compare and contrast the three types of databases.
- Define a Database Management System (DBMS).
- Define and apply data abstraction.
- Understand the concepts of entity relationships.
- Define data normalization and apply its fundamentals to existing data models.
- Identify and optimize data with respect to normalization rules.
- Understand and apply Structured Query Language (SQL).
- Define a transaction-oriented DBMS.
- Differentiate the types of distributed DBMS models.
- Understand the concepts of client-server computing.
- Compare and contrast a database and data warehouse and the specific roles of each.

COURSE OBJECTIVE, OUTCOME, AND ASSESSMENT

Objective: Upon completion of this course, the student will understand the concepts of database design. The student will gain proficiency with an industry standard database for use in this course.

Outcome: Students will demonstrate critical thinking, qualitative application methods, and quantitative reasoning skills in the design of databases—both in the logical and physical aspects. Students will be able to apply Data Manipulation Language (DML) to convert the abstract logical model to the physical model.

Assessment: Students will complete scenario-based assignments based on data modeling. Models are assessed on "correctness" based on interpretation of business rules coupled with modeling techniques discussed. The student's ability to reduce redundant attributes while maintaining the integrity of the entire system is assessed. Students will exhibit precise implementation of the physical model into an industry standard database. Examinations and out of classroom assignments will be used as an assessment tool.

COMPUTER HARDWARE AND SOFTWARE

The course requires extensive work on IBM compatible computers similar to Cedar Crest College's micro labs located in the basement of the AD building and in Curtis. Labs are available whenever the building is open (and class is not in session in the room) and any computer in any lab or dorm lab may be used providing the necessary software is installed. Assignments must be completed in the specific software package and version discussed in class. Cedar Crest College does not provide software for use on personally owned computers. If the student wishes to purchase the software packages it is the student's responsibility to properly install such software. The instructor, peers, or Cedar Crest representatives are not responsible for supporting individual students' computers. Sharing diskettes for class assignments, sharing network accounts, and copying software are violations of the honor code. Sharing commercial programs is a violation of U.S. copyright laws.

All software used in the course will be available only on the local-area network. All students need to apply for an account to use the LAN and Internet. If you own the software required for the assignment (and the proper version/revision number) you may use it for class assignments. In the event you own a different version or a competitive product, you must obtain permission from the instructor *prior* to beginning your project. For example, Microsoft Excel is the spreadsheet on which Cedar Crest assignments are based. Using Microsoft Works is *not* acceptable. **Using Microsoft Works is *not* acceptable as its file formats are not compatible with Microsoft Office. Submitting assignments that cannot be opened by the instructor results in a grade of zero for that assignment.** Under no circumstances are you permitted to copy software from the Cedar Crest Labs for use at home.

Note: Saving work on the public hard disks (C:, desktop, "My Documents", etc.) is not advisable because there is no security on the local machines and your work may be deleted at any time. Work lost on the network disk may be recovered, in some instances, and Computing Services should be contacted immediately to schedule potential recovery. You should always backup (keep two copies) your work.

CCC HONOR CODE

Please be reminded of Cedar Crest College's Honor Philosophy during this course. The Honor Code applies to and is not limited to class assignments and examinations.

I fully support the Cedar Crest College Honor Code and the Classroom Protocol code as stated in the Customs Book.

CCC POLICY FOR LEARNING DISABILITIES

Students with documented disabilities who may need academic accommodations should discuss these needs with their professors during the first two weeks of class. Students with disabilities who wish to request accommodations should contact the Advising Center.

CCC LAB ASSISTANTS AND TUTORS

A lab assistant is assigned to do hardware and software maintenance at each dorm lab, and her name and room number are posted in the dorm. Additionally, there is a lab assistant on duty to provide more extensive help at the central site most days, evenings and weekends. They are trained to handle questions but are instructed not to provide help which would violate the honor code. THE LAB ASSISTANTS ARE NOT RESPONSIBLE FOR ANY OF YOUR COMPUTER WORK; YOU SHOULD NOT EXPECT THEM TO TUTOR YOU OR MAKE UP FOR MISSED CLASS TIME OR POOR NOTES. Specifics will be discussed in class. Hours and pictures are posted in Lab 1.

The Cedar Crest computer labs are at all times a work area and not an entertainment area. It is absolutely essential that all students find a comfortable, quiet atmosphere conductive to work. Violations in the form of loud, disruptive behavior of any kind will not be tolerated and will be handled according to established policy.

Tutors are available for most course offerings at Cedar Crest. *Tutors should be not relied upon to complete assignments.* Tutors should offer assistance when the student cannot resolve a particular difficulty. Students should attempt to the best of their ability to work through difficulties encountered. In this way the students' problem solving skills will be sharpened for post-academic employment.

ASSIGNMENTS

All assignments in this class are created on the computer using the tool used with this course – Microsoft SQL Server. Such assignments must be submitted with electronic media. That is, either diskette, CD-R/W, ZIP-100/250, USB Disk, or via the Cedar Crest Email system.

Printouts alone are not acceptable.
If assignments require printouts do not submit the assignment without including the electronic (database file or SQL script) version! If the assignment requires multiple printouts to illustrate your progress, you may save multiple versions of your work and submit all of them electronically.

Additionally, all assignments must adhere to the following specifications:

- Proprietary material **may not** be submitted as part of any course assignment. This is considered plagiarism and could result in severe penalties to the student.
- All course work may be submitted only once.
- All course work, unless designated as a group project, must be completed solely by the student. Sharing of work is considered breach of the Honor Philosophy.
- Handwritten assignments will be accepted (where applicable); however, it is the student's responsibility to verify the writing is legible or point deductions may occur.
- The tone of writing within documents submitted must be scholarly in nature and language.
- Writing style when submitting research papers must adhere to MLA guidelines.
- Some assignments use a data disk for completion. All files required are copied onto the Cedar Crest file server (T:) for convenience.
- It is your responsibility to secure your work from unauthorized duplication and taking precautionary steps to avoid corruption of your work.

If an assignment is not completed and turned in on the due date, five percent of the total value of the assignment value will be deducted PER DAY AFTER THE DUE DATE THAT *I* DO NOT HAVE THE ASSIGNMENT – NO EXCEPTIONS. If an assignment is handed in late it should be submitted into the DROPBOX or emailed for prompt reception of credit. Late assignments will be graded when the instructor *receives* them—not based on a date written by the student. If a student wishes to receive credit based on the date submitted, the assignment must be accompanied with a date and signature of the department secretary. Late assignments will be returned after on-time assignments are graded so it is possible that your late assignment will not be returned in time for studying for examinations. Submit your work on the due dates.

All work returned and graded you are encouraged to keep for reference. Your instructor will attempt to return the graded work by the next class. Assignments represent a high percentage of your grade. The student who is not willing to give a commitment of time and energy to the computer will almost certainly fail. Projects for this class will require a substantial dedication of time.

All assignments are designed for the average student's ability. The instructor will provide assistance in the event a student has difficulties with assignments. The degree of assistance and when the assistance occurs is at the sole discretion of the instructor. It is not the responsibility of the instructor, tutors, or peers to supply specific formulae or source code. Students must plan their time judiciously. It is the student's responsibility if assistance cannot be granted before the due date of an assignment causing late penalties to be incurred because of poor time management.

All assignments must adhere to the standards set forth by user interface design. Most of these are explicitly described in class while others will be implied based on related topics. These standards are *cumulative* throughout the course and the student must implement these. Failure results in point deductions on these assignments.

There are no "assignment/exam reviews" in this class. That is, you may not pre-submit your work and request your instructor to comment on your progress, accuracy, or exactness of your work prior to grading. Assignments or examinations are submitted for grading one time. There are no retries.

CLASS ATTENDANCE

Attendance at all classes is highly recommended, as we are covering an extensive amount of material which may seem disjointed and overwhelming without the continuity of classroom discussions. Some classroom discussions will require a "hands-on" approach and some will discuss material not covered in the text. While handouts will be provided, you will be responsible for the materials in the text and discussed in class.

If a student cannot attend a class meeting, it is solely the student's responsibility to complete all assignments by the designated due date using electronic mail, inter-office mail, hand-delivery, etc. Likewise it is the student's responsibility to obtain any course notes and information discussed in class. If handouts were provided the instructor will maintain copies for the student during the absence. *The instructor is not required to maintain or give details to a student of any material discussed in class. Likewise, students are not permitted to borrow or view the instructor's materials not designated for class use for any reason.*

Almost all computer assignments will be discussed in some detail in class and some may be modified, so your constant attention is required. Statistics on students who have been unable to motivate themselves to attend this class are dismal, but very revealing.

EXAMINATIONS

Attendance is mandatory on the exam dates listed on the syllabus. Failure to notify the instructor IN ADVANCE and produce a documented excuse will result in a grade of 0 for that exam. NO EXCEPTIONS.

Examinations are designed to assess the student's knowledge in the subject matter. This includes the ability to apply and critically think through problems. Therefore examinations will include questions based on application of theories. Wrote memorization will not constitute 100% of any examination. Technology changes at an extremely rapid pace and the ability to apply knowledge is critical to future success and exceeding expectations in the workplace.

The class meeting before an exam will have some time allotted for review. The review clarifies any questions the students may have based on materials to be included on the exam. The student should take careful notes during the semester as the exams focus on materials discussed in the classroom.

Please note: The late penalty (5% per day) for assignments does not apply to examinations. A late examination is a zero.

Cedar Crest Final Exam Policy: Your obligations for this course include attendance at the final exam, on the day and time scheduled by the Registrar's Office. You should not make travel arrangements until the final exam schedule is published; if you must make plans early, you should schedule your travel after the last final exam day 

OFFICE HOURS

I will be available in my office in Curtis 204 or in the lab during this time or location and times may be scheduled by appointment. Office hours are provided on a first-come first-served basis unless previously scheduled. Please note that office hours are not a substitute for tutoring and this time should not be regarded as personal tutoring time. In this way all students will have potentially equal access to the instructor of this course.

Students should be considerate and not interrupt an existing session the instructor is leading while awaiting their time slice. Likewise, students should not attempt to impose deadlines on tutors, the instructor, or peers if assistance is desired.

Monday: 6:00 pm-7:00 pm
email: trmarasc@cedarcrest.edu
Phone: 610/437-4471 (ask for Rebecca)
Course Webpage: http://www.cedarcrestonline.net

COURSE REQUIREMENTS AND GRADING

Points for this course are listed below as well as the number of points required for the respective letter grade. Points required are determines by the Department and not the instructor. Please note that in assignments and examinations points are distributed in a graduated form. Therefore, in an assignment with five parts with a total value of ten points, do not assume each part is worth two points. More difficult parts will have a higher point value.

One Exam (100 pts)	33.3%	A:	279	C+:	231
Final Exam (100 pts)	33.3%	A-:	270	C:	219
Projects (100 *total*)	33.3%	B+:	261	C-:	213
		B:	249	D+:	201
Total – 300 pts.	100%	B-:	240	D:	180

SYLLABUS[*]

Date	Lecture Topics **[Pages and Text abbreviation are in Brackets]**	Assignment **(Due Date) READ THE FOOTNOTES**
8/25	Database Systems [4-25] Data Models [28-53]	
9/1	LABOR DAY HOLIDAY – NO CLASS	
9/8	Data Models [28-53] The Relational Database Model [59-94]	
9/15	The Relational Database Model [59-94] The Entity Relationship Model [102-136]	
9/22	The Entity Relationship Model [102-136] Normalization of Database Tables [147-176]	
9/29	Normalization of Database Tables [147-176]	
10/6	Advanced Data Modeling [183-204]	
10/13	FALL BREAK – NO CLASS	
10/20	Exam I Introduction to SQL [213-274]	
10/27	Introduction to SQL [213-274]	
11/3	Introduction to SQL [213-274]	
11/10	Advanced SQL [285-354]	
11/17	Advanced SQL [285-354]	
11/24	Transaction Management and Concurrency Control [395-423]	
12/1	Database Performance Tuning and Query Optimization [425-452]	
12/8	The Data Warehouse [490-540] Database Administration [590-634]	
TBD	Final Exam	

[*] Dates subject to change