



Knauss School of Business

ITMG 320: Database Design and Business Intelligence Implementation

TTH 5:30 - 6:50 PM LC 106

Instructor: Dr. Carl M. Rebman, Jr.
Office: Olin 127
Office Hours: TTH 7:00 PM - 8:00 PM [LC 106]
W 12:30 PM -2:30 PM [OLIN 127]
TH 1:45 PM – 2:15 PM [LC 106]

Other times by appointment.

Teaching Schedule TTH 2:30 PM – 3:50 PM
TTH 4:00 PM – 5:20 PM
TTH 5:30 PM – 6:50 PM

Office Phone: (619) 260-4135

Home Phone (619) 283-6690

E-mail: carlr@sandiego.edu

Course Web Site http://carl.sandiego.edu/itmg320_or
<http://54.193.10.58/itmg320>

TEXT(s):

[Database Design – 2nd Edition](#) by Adrienne Warr and Nelson Eng is used under a [CC BY 4.0 International License](#). Download for free from the [B.C. Open Textbook Collection](#).

Optional Text: *Database Systems, Design, Implementation, and Management, 13th Ed.* Carlos Coronel, Steven Morris ISBN-10: 1-337-62790-9 ISBN-13: 978-1-337-62790-1

Additional readings and materials may also be assigned on a periodic basis.

Software Tools: Microsoft Excel (*all computers in the labs have access to this software*), MS SQL Server. (*access will be provided via EPIC*), Microsoft Access (*all computers in the labs have access to this software*.)

Computer Labs are available on campus inCheck for current operating hours here
<https://www.sandiego.edu/its/support/labs/hours-of-operation/general.php>

Other Readings: May be placed on E-Reserves in the main library or handed out in class.

Required Equipment: One USB memory stick, or other type of backup device for files, to be brought to class DAILY.

Course Description:

Humans produce a LOT of data - according to the World Economic Forum, we crossed 4 Zettabytes (1 trillion Gigabytes) of data worldwide in 2014, and now expected to reach 44 Zettabytes in 2020. . That data is used for a wide range of useful things - health care, web search, maps, weather simulation, scientific research, etc. The massive volume of data being produced and consumed for these purposes has made Big Data a very hot topic these days, and NYU even has its own Data Science Institute.

Databases are the backbones of modern scholarly, scientific, and commercial information systems. For example, NASA uses databases to manage voluminous quantities of data generated by its many missions, and large pharmaceutical companies use databases for drug-discovery. Use of databases in the humanities and social sciences is also growing. For example, the Library of Congress maintains an important database called Thomas for managing U.S. congressional records, legislations, and historical documents. Establishment of rigorous standards and design principles has helped to broaden the applications of databases. However, experience has shown that careful attention to demands of users and particular contexts of use is of great importance in achieving design effectiveness.

Database systems are tools we can use to store and manipulate all that data for useful ends. The goal of this course is to teach you how to create databases and to use database systems productively. This includes the following topics:

- Modeling Enterprise Data with ER Diagrams
- SQL, as a language for both Data Manipulation and Data Definition
- Logical and Physical Design of Databases
- Transaction Processing and Concurrency
- Online Analytical Processing
- Using databases on backend servers
- Using databases with interconnectivity to Business Intelligence

A majority of business data are stored in traditional data systems, such as relational databases. While other data sources, e.g., social media, messaging data, and machine sensors, are also increasing in importance, the data stored in traditional data systems are often of central importance in business analytics projects. To access and analyze these data, business analytics professionals need knowledge of relational databases and SQL. Consequently, SQL and relational database skills are two of the most sought-after skills by recruiters that hire business analytics professionals (Mamonov et al. 2015; Wixom et al. 2014).

COURSE OUTCOMES After taking this course you will be able to:

- describe basic relational database and data warehouse concepts
- create and interpret data models implemented using Entity Relationship Diagrams (ERD)
- describe what is involved in a successful database implementation.
- list the potential advantages of the database approach
- Learn database design principles
 - Requirements specification
 - Data modeling
 - Schema transformation
 - User interaction
 - Evaluation
- design and create a database
- manipulate dataset with Structured Query Language (SQL)
- query databases using SQL and applying SQL to the solution of problems
- optimize data structures and tables that eliminate duplication, unnecessary data entry, and confusion.
- merge, analyze and query databases to produce new information and solve problems
- describe basic principles of visual perception and cognition and design thinking related to data visualization and identify appropriate visualizations for different types of data and best practices for creating visualizations
- use interactive data visualization to understand and analyze data
- create effective visualizations and data stories to communicate data analysis results
- Perform good presentation skills
- Demonstrate technology research, writing, and evaluation skills

Workload & Expectations

Database administration is time-intensive, but it pays off! Average “Database Administrator” salary is ≈\$63,000 and “Database Manager” salary is ≈ \$111,000 (Indeed.com, 2023). Salaries of seasoned “Data Scientists” exceed \$120,000 annually. Databases are naturally a time-intensive field, which is why salaries for database professionals are higher than in other fields. Therefore, you should expect to spend an average of 6 – 8 hours OUTSIDE of class per week working on and learning the material. Some weeks you may spend more than 6 – 8 hours and some weeks you may spend less. It is vitally important that you be open to “hacking” by taking advantage of open access resources on the internet (ie: Stack Overflow, DataCamp, etc.) to *independently* supplement the course materials assigned. Being able to experiment *on your own* with trial and error is an important part of studying analytics. It is also critically important that you *follow directions carefully* to streamline efficiency and to avoid redundancies in questions and processes. An example of how you may allocate your 6 – 8 hours study time each week is as follows (everyone is unique so you may personally have a different allocation of your time; this is just an example):

- 2 hours: reading the relevant assigned readings and taking your own notes on the readings
- 1 hour: reviewing examples and notes from lecture
- 1 – 2 hours: working on assignments (worked examples, code chunks, problem sets, projects)
- 1 – 2 hours: going to office hours and/or reviewing with peers (group study)
- 1 hour: troubleshooting and researching

Teaching Method

*The student is expected to have read materials or completed assignments as listed on the course schedule **prior to each class**. The class discussions/lectures are intended to illustrate the primary concepts from each section and to provide an opportunity to answer any questions that may result from the readings.*

Exams/Quizzes

The format for exams/quizzes will vary between true/false, multiple choice, matching/short answer and computer based. Most quizzes will be announced in advance although you should be prepared for the possibility of an unannounced quiz. The format for the exams will be primarily computer based with some possible multiple-choice questions. There are **NO** make-up exams or quizzes. Students missing a scheduled exam due to a **PRE-ARRANGED** excused absence will be allowed to take a final exam that will count as 50% of his/her final grade.

Academic Integrity:

You, your colleagues, faculty, staff, and alumni are the University of San Diego. These and many other persons have worked very hard since the founding of USD in 1949 to build a quality university. The philosophy and mission of USD <http://www.sandiego.edu/about/mission-vision-values.php> emphasizes the idea of personal and academic integrity. The following is a synopsis of the academic integrity policy. For more information click on this hyperlink <http://www.sandiego.edu/associated-students/branches/vice-president/honor-council/integrity-policy.php> or download this pdf <http://www.sandiego.edu/conduct/documents/HonorCode.pdf>

“All members of the University community share the responsibility for maintaining an environment of academic integrity since academic dishonesty is a threat to the University. Acts of academic dishonesty include a) unauthorized assistance on an examination; b) falsification or invention of data; c) unauthorized collaboration on an academic exercise; d) plagiarism; e) misappropriation of resource materials; f) any unauthorized access of an instructor’s files or computer account; or g) any other serious violation of academic integrity as established by the instructor.”

Academic Dishonesty will not be tolerated in any form. Helping each other study is anticipated. However, only original work will be accepted. There will be no sharing of materials, wearing hats, or using cell phones/PDAs during tests. All assignments unless otherwise noted are individual assignments. **If an incident of academic dishonesty occurs in this course the student could receive a grade of "F" for the semester and could possibly face further disciplinary action.**

Student Disability Policy

The University of San Diego complies with the American with Disabilities Act and Section 504 of the Rehabilitation Act It is

a University of San Diego Disability Services policy that when students are scheduling exams (midterm exams or final exams) in the Disability office, they must submit an "Authorization to Administer Exam" at least one week prior to the exam date. If a student does not give Disability office this notice, the Disability office can deny them the right to the accommodation, as the Disability office is not given adequate time to prepare (and set up office space during established exam scheduling times.) Please provide me (your instructor) with a Letter of Accommodation drafted by the Disability office as soon as possible. There are no retroactive accommodations for Disabled students. As your instructor, I am not obligated to provide accommodations until I receive the Letter of Accommodation drafted by the Disability office. If a student does not give the Letter of Accommodation to me (your instructor), within adequate time to make exam arrangements, I am not obligated to fulfill any such request. If you have any questions or concerns about the process please contact, the USD Disability Services office (Serra Hall, Rm 300), phone at 619-260-4655 or via email at disabilityservices@sandiego.edu as soon as possible.

Communication Policy E-Mail

Due to the subject matter of this course, it is very important that every student obtain an email account either from the University or from a private provider of the student's selection as various assignments will be need to be submitted via email. In addition, course announcements may be distributed via electronic format. It is the student's responsibility to check their email account on a regular basis (outside of class) during the duration of the course. It is recommended that students should retain a copy of all email correspondence with the instructor until the end of the semester. ***Unless otherwise directed no email should be sent to the instructor during class sessions.***

EMAIL MESSAGE FORMAT: To ensure that I respond to your email quickly, please use this as the **SUBJECT LINE** when sending an email to me:

ITMG 320 (followed by subject description)

Attendance/Absence/Participation/Professionalism:

Attendance is critical for success in this class. It is in the student's best interest to attend class every day. It is understood that events may cause one to have to miss class to which advance notice is preferred. 100 points are allocated towards ***attendance, class participation and professionalism***. Failure to be in class when attendance is taken can result in 0 points awarded for that session. This can also include being late after attendance has been taken or leaving class early. ***Furthermore, failure to attend more than 50% of all class lecture and lab sessions will result in failing the course.*** Lastly keep in mind that attendance, participation, and professionalism are three separate items, that is, you need to more than just show up; you are expected to be prepared and contribute to class activities and discussion. Also engaging in Internet surfing, IMs, games, or sending emails during class will not be tolerated and will result in a reduction in points. Plus, you will find it much easier to keep up and master the material if you attend regularly. You are responsible for all material covered in class or assigned during a class even if you were absent. Please contact me as soon as possible if you know you must miss a class.

Grade Weights	Percent
EXAM ONE	10%
EXAM TWO	10%
FINAL EXAM	25%
Homework, In-Class Assignments, Quizzes, Projects, Presentations	45%
Attendance/Class Participation and Professionalism	10%

TOTAL PERCENT	100%
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Grading

During the course of a semester a student might have concerns or challenges and wish to have a grade appeal. This is fine, however, any grade petition/appeal must be done **within two days** after the grade has been returned. All grade petitions/appeals can be done in person but **MUST** also accompanied with an email petition/appeal submission. All grade petition/appeals must be resolved after one week. *NO GRADES or GRADE PETITION/APPEALS will be entertained after ONE WEEKS.* Once this time has elapsed the window for grade reconsideration is expired. Please note that no grade appeals will be entertained during a class session, you must either come to me office hours, or contact me via phone or email.

Scale	Total Points
A+	>97 %
A	93 % - 96%
A-	90 % - 92.9%
B+	87% - 89.9%
B	83% - 86.9%
B-	80 % - 82.9%
C+	77% - 79.9%
C	73% - 76.9%
C-	70% - 72.9%
D+	67% - 69.9%
D	63% - 66.9%
D-	60% - 62.9%
F	59% and below

Important NOTICE: This grading scale is extremely strict. You must have the exact minimum number of points to receive the grade you desire, that is exactly 930 is an A, but 92.9 (or 929.9999) is an A-, and so on. Therefore, note that in advance all petitions to round up to

the higher point value will be denied.

Also note the instructor reserves the right to modify or change any part of this syllabus at any time.