BEEDIE SCHOOL OF BUSINESS

Course Title: Business Data Management (BUS 464)

Course Outline

Fall 2015

Instructor: Dr. Nilesh Saraf
Office: WMC 3250
E-Mail: nsaraf@sfu.ca

Lecture & lab: M: 2:30 - 5:20 pm (Room: WMC 3533)
Office hours: Wed (11 to 12 pm) or by appointment

Course Objectives

Data management is central to every business because each business process results in the creation of new data -- about customers, orders, accounts, payments, suppliers, products, tickets, employees, etc. With almost unlimited and cheap computing power and storage, every manager is now interested in analyzing such large databases quickly. Their goals are to predict customer behavior, monitor accounting fraud, follow inventory trends, or predict employee performance, to name a few. Both, technology and business skills, are critical towards achieving these goals because data has to be integrated across all business units, at all times. The best IT platform is like a well-coordinated "orchestra". This is challenging because: every business has an "ever-changing" mixture of technologies and business.

This course will focus on the main component of information systems that deals with digitally storing and accessing business data – DataBase Management System (DBMS). While all business applications are always deployed on top of DBMSs, most businesses also have numerous DBMSs. This makes it difficult and complicated for managers to mix-and-match data from across a business to make decisions.

The core skill delivered through this course is designing databases for two very different (sometimes contradicting) business objectives:

A) to design a database so as to enable capture of raw data and reporting of lower-level transactions, typically for middle managers

B) to design a database so as to expedite business-decision making by aggregating large quantities of data, typically for top managers

The above two objectives mean different database designs. The course will achieve these objectives through a blend of class exercises, assignments and team work.

The key highlights of the course are:

i. Conceptual modeling of business data (MySQL Workbench)
ii. Structured Query Language (SQL) for summarizing business data (MySQL Workbench)
iii. Group assignment (MySQL workbench) on designing and building a business database.
iv. Understanding how to transform operational data for data-warehousing and online analytical processing (Microstrategy BI)
v. Visualizing data (R packages, Tableau & Pajek for Social Network Analysis).
vi. Understanding of managerial issues with database administration, data quality, security, privacy and storage.

Required material

Textbook: Data Management, Rick Watson, 6th Edition (online, kindle version) (textbook website: http://www.richardtwatson.com/dm6e/). The following book on reserve in the library is an older version but follows a similar structure – but is not a replica. It is your responsibility to identify the mismatches. *Data management : databases and organizations / Richard T. Watson. Published New York, NY : J. Wiley, c2004.Edition 4th ed.* **Computer:** You will need a laptop on which you can install software including MySQL Workbench & MySQL server to be used regularly. **Important**: The Kindle App installed on Macs does not allow copying text for pasting it in other software. So I recommend having Bootcamp installed on your Mac or rent a Windows machine for the semester (with administrative rights so you can install software).

Teaching Philosophy

You are now emerging as an MIS professional and are with classmates who have similar interests. This is a good course to meet and work with like-minded students. I also believe that both you and I are in this course because we want to be and that we both want to learn something from each other. I will spend a lot of time preparing for each meeting with you.

My objective is to take your understanding of information systems deeper than your previous experience. I'd like to help you see how useful digital databases can be and how business decisions require extensive analysis of information. My aim is that when you finish this course, you'll feel comfortable modeling data and understanding the complexity of information systems (It's not just about the "plumbing"!!). What you learn will hopefully stay with you long after you graduate.

Grading

Component	Type	Course Weight	Description
Exams	Individual	20+30	Paper-based. No cheat sheets.
Term project assignment	Group	25	This is a hands-on assignment. You are given instructions how to implement a transaction processing system and analytical database. A sandbox project will illustrate a parallel set of steps. 2 deliverables – one mid-semester, the other at the semester end. **Groups formed by students**.
Homework	Group	25	Given every week. **I will form these groups**. These will be marked every week.
Quizzes	Individual	0	At the start of each class there will be a mini-quiz (on projector). The reading material for each quiz will be declared in the previous week. One question from each quiz will be on the exams. The questions will not be posted on Canvas.

Course Organization and Resources

The course consists of 13 modules. The entire course will delivered in the classroom. Course material will be made available through Canvas. EVERYONE needs to bring a laptop to class.

Once you are comfortable with MySQL and are able to design a database yourself, I recommend that you complete the following courses from Lynda.com.

1. Installing Apache, MySQL, and PHP
2. PHP with MySQL Essential Training
3. PHP with MySQL Beyond the Basics

Based on what you learn from these tutorials I also invite you to approach the Term Project teams of BUS 362 in Fall 2015 and collaborate them to create PHP-based applications. You can explore with me the possibility of claiming 2-credits with me in teams of two in that semester.

Policies

1. **Class Participation & Attendance**: Attendance at all weeks is essential for success in this course. This needs to be an interactive class. It will really make your class interesting if you or others interact. So I will call upon any student to share their solution for in-class work. Reluctance or lack of work will reflect in **negative points** at the end of the semester since either it means you are distracted on the laptop/facebook or you are simply unprepared or not trying hard enough.
2. Arrive to class on-time. Contact me before class if you expect to be late or need to leave early. If you are unable to attend class due to very genuine reason(s) (excepting an emergency) you need to contact me at least 1 week prior to ask about alternative arrangement that I may or may not be able to make.
3. Students who miss examinations because of illness or for compassionate reasons are required to obtain a physician's certificate or other supporting documents in order to obtain consideration in the course. For other serious and unforeseen emergencies behind missing exams, classes or deadlines please ask me.
4. It is necessary to turn off cell phones, pagers and text message alerts before class. Use laptops for class purposes only and not for surfing, online social networking, E-Bay'ing and IM'ing. It is easy to spot individuals who are distracted by their laptops and phones. Usage of these will attract a penalty for lack of class participation.
5. Typically, I have awarded grades in accordance with the suggested marking norms for undergraduate courses at Beedie. But this can change.
6. Late submissions will not be accepted ***even if Canvas is inaccessible***. To avoid situations where you are unable to submit because Canvas service is unavailable I suggest you submit well in advance.
7. For contacting students by email I will use only their SFU email address. Please make sure you have access to your SFU email account.
8. **Freeloading**: It occasionally happens in class and enterprise settings that someone in a group is not prepared to do his/her share. I recommend that the team give the freeloader one warning (by email and cced to me) and then fire that person from the team. That person will then do group assignments individually or find another team to join. The team should notify me of the change in team composition immediately. I distribute a form to assess team participation at the end of the semester. If a major disparity in team contribution is reported, I will adjust team project grades.
9. **Sharing course material**: You are on your honour not to share any of the course materials and answers with other individuals not in this class during or after the semester. Doing so will impede class functioning in future and undermine the educational goals of this course -- and your university. If your close friend requests you to share, you should bring this note to his/her attention.

Schedule

1. The schedule is updated regularly and made available through Canvas. However, the schedule for two weeks in future can be considered final. In case there are important changes I will email the class. **Please check your SFU email regularly.**
2. You may find extra material about a past session in that specific week's folder (Module) on Canvas.

*Class Schedule (*Updated Tuesday, September 01, 2015)

SEP 8 Week 1 – Single entity in Entity Relationship Diagram (ERD)

1. Home	2. Review & recap		3. Workshop	4. Home
Read Ch 3 Recommended: Ch 1-2	•Course introduction & structure •Evaluation •Introduction to MySQL Workbench	Quiz on ERD skills	•Intro to data management •Modeling one entity •SQL exercises •Application	• complete txtbook exercises • homework[1]

SEP 15 Week 2 –1:M relationships in ERDs

1. Home	2. Review & recap	3. Workshop	4. Home
• Read Ch 4 • Prep for quiz	•Take the quiz •Debrief quiz •Previous homework	•Modeling multiple entities •SQL exercises •Application	• complete txtbook exercises • homework

SEP 22 Week 3 -- M:M relationships in ERDs

1. Home	2. Review & recap	3. Workshop	4. Home
• Read Ch 5 • Prep for quiz	•Take the quiz •Debrief quiz •Previous homework	•Modeling (ERD) •SQL exercises •Application **•Introduction to the Term Project**	• complete txtbook exercises • homework

SEP 29 Week 4 -- M:M relationships in ERDs

1. Home	2. Review & recap	3. Workshop	4. Home
• Read Ch 5 • Prep for quiz	•Take the quiz •Debrief quiz •Previous homework	•Modeling (ERD) •SQL exercises •Application	• Complete additional practice problems • homework • apply to term project

OCT 6 Week 5 -- 1:1 & Recursive relationships in ERDs

1. Home	2. Review & recap	3. Workshop	4. Home
• Read Ch 6 • Prep for quiz	•Take the quiz •Debrief quiz •Previous homework •Midterm exam review	•Modeling (ERD) •SQL exercises •Application	• complete txtbook exercises • homework • apply to term project

OCT 13 – ****midterm exam**

OCT 20 Week 6 -- Specialization/Generalization in ERDs

1. Home	2. Review & recap	3. Workshop	4. Home
• Read Ch 7, 9 & 10 • Prep for quiz	•Take the quiz •Debrief quiz •Previous homework	•Modeling (ERD) •SQL exercises •Application	• complete txtbook exercises • homework • apply to term project

OCT 27 Week 7 -- Spatial and Temporal Data in ERDs

1. Home	2. Review & recap	3. Workshop	4. Home
• Read Ch 11 & 8 • Prep for quiz	•Take the quiz •Debrief quiz •Previous homework	•Modeling (ERD) •SQL exercises •Application	• complete txtbook exercises • homework

[1] Submit homework every Saturday before 5 pm.

NOV 3 Week 8 – Star Schema Data Model

1. Home	2. Review & recap	3. Workshop	4. Home
• Read Ch 13 • Prep for quiz	•Take the quiz •Debrief quiz •Previous homework	•Modeling •SQL– ETL from an operational DB to an analytical DB	• complete txtbook exercises • homework • apply to term project

*****Term Project Due (1st Deadline – Friday 5 pm)*****

NOV 10 Week 9 – Snowflake Schema Data Model (OLAP (Microstrategy) ~~& Tableau~~)

1. Home	2. Review & recap	3. Lab (In-Class)	4. Home
• Read Ch 13 • Article (TBA) • Prep for quiz (previous week's reading)	•Take the quiz •Debrief quiz •Previous homework	•Modeling •Microstrategy demo •SQL– ETL from an operational DB to an analytical DB	• complete txtbook exercises • homework • apply to term project

NOV 17 Week 10 – Advanced Topics (Introduction to R, Visualization with R & Pajek)

1. Home	2. Review & recap	3. Lab (In-class)	4. Home
Read Ch 14, 15 & 19	•Take the quiz (Ch 19 only) •Debrief quiz •Previous homework	Visualization using R studio Visualization using Pajek	• complete txtbook exercises • homework

NOV 24 Week 11 - Advanced Topics (Hadoop and Map Reduce)

1. Home	2. Review & recap	3. Lab (In-class)	4. Home
Read Ch 17 + 21	•Take the quiz •Debrief quiz •Previous homework	•Running a MapReduce program •The DBMS data model •SQL for data admin •Final exam review	• complete txtbook exercises • homework

DEC 1 Week 12 - TBA

1. Home	2. Review & recap	3. Lab (In-class)	4. Home
Read Ch 17 + 21	•Take the quiz •Debrief quiz •Previous homework	•Running a MapReduce program •The DBMS data model •SQL for data admin •Final exam review	• complete txtbook exercises • homework

*****Term Project Due (2nd deadline, December 3 Th 5 pm) *****

*****Final Exam Dec 12 SATURDAY 3:30 to 6:30 PM *****