MIS2502.001– Data Analytics
Spring 2017 (CRN 19394)

About the Instructor:

Alvin Zuyin **Zheng** (zheng@temple.edu)
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Phone: 347-819-0936
Office hours: Monday **10:00AM – 11:00AM**
Wednesday **2:00PM – 3:00PM** or by appointment

Class Location and Time:

Alter Hall 231 9:00am – 9:50am, Monday, Wednesday and Friday
On the web: **http://community.mis.temple.edu/mis2502sec001s17**

Prerequisites:

Grade of C or better in MIS2101.

Course Description:

The course provides a foundation for designing database systems and analyzing business data to enhance firm competitiveness. Concepts introduced in this course aim to develop an understanding of the different types of business data, various analytical approaches, and application of these approaches to solve business problems. Students will have hands-on experience with current, cutting-edge tools such as MySQL and R.

Course Objectives:

- Articulate the key components of an organizations' information infrastructure.
- Create data models based on business rules.
- Create a transactional database from a model using SQL.
- Create an analytical data store by extracting relevant data from a transactional database.
- Perform extract, transform, load (ETL) functions such as data sourcing, pre-processing, and cleansing.

- Discover trends in analytical data stores using the data mining techniques of clustering, segmentation, association, and decision trees.
- Present data visually for clear communication to a managerial audience.

Required Textbook:

There is no required textbook for this course.

Course Websites:

We will use both the MIS community site and blackboard site. The detailed usage of the two sites is as follows.

Website	Usage
MIS Community Site: **http://community.mis.temple.edu/mis2502sec001s17**	The community site has an up-to-date copy of the syllabus, schedule, class announcements, slide decks, In-class activities, assignment instructions, as well as other course documents. While I will try to make announcements both in class and on the community site, it is a good idea for you to check the web site regularly.
Blackboard: learn.temple.edu	The Blackboard site is primarily for assignment submission. The grades will also be posted on Blackboard.

Evaluation and Grading

Item	Percentage
Exams (3)	60%
Assignments (9)	30%
In-class activities	5%
Presence & participation	5%

Scale			
94 – 100	A	73 – 76.99	C
90 – 93.99	A-	70 – 72.99	C-
87 – 89.99	B+	67 – 69.99	D+
83 – 86.99	B	63 – 66.99	D
80 – 82.99	B-	60 – 62.99	D-
77 – 79.99	C+	Below 60	F

Exams

There will be three exams during the semester. Tentative exam schedules are available below.

- Exam 1: **Feb 22**, during class time
- Exam 2: **Mar 29**, during class time
- Exam 3 (final exam): **May 8**, 8:00am-10:00am, in the same room for classes (Alter 231)

While there is some natural overlap in material between the exams, the exams are not intended to be cumulative.

Make-up exams will not be given under most circumstances. Exceptions are granted at the instructor's discretion and are typically limited to extreme circumstances such as documented hospitalization. If a student is permitted to take a make-up exam, the instructor reserves the right to substitute an alternate exam with different content. Students may find the content of the make-up exam to be more difficult than the original. It is, therefore, to a student's advantage to show up for each exam at the scheduled time and take it with the rest of the class.

Assignments

There will be nine assignments. **All assignments should be submitted via Blackboard before due date**. They are to be done individually and should represent your own work. If you need help, you may consult with your instructor.

#	Assignment	Tentative Due Date
1	ER Modeling	Feb. 3
2	SQL #1 – Getting Data out of the Database	Feb. 17
3	SQL #2 – Putting Data into the Database	Feb. 27
4	ETL in Excel	Mar. 10
5	Pivot Tables in Excel	Mar. 24
6	Introduction to working with R	Apr. 3
7	Decision Trees	Apr. 12
8	Clustering	Apr. 17
9	Association Rules	Apr. 26

Late Assignment Policy

All assignments will be assessed a 50% penalty (subtracted from that assignment's score) for the **first day** (i.e. 24 hours) they are late. **No credit will be given for assignments turned in more than 24 hours past the deadline. Equipment failure is not an acceptable reason for turning in an assignment late.**

A Note on Regrade Requests

We make every effort to return exam/assignment grades within 1 week of submission. If you believe that your grade is inaccurate, you may request a regrade under the following conditions:

1. Regrade requests must be submitted within 1 week of the date when the grade was returned.
2. For project and assignment grades, regrade requests must be emailed to the instructor and must outline the reasons you deserve a higher grade. Referencing another student's grade is inappropriate and irrelevant. While we do our best to apply an even standard across students, we can't discuss anyone else's grade with you, so we need to deal with the merits of your particular case.
3. For exam grades, regrade requests must be made during office hours.
4. I reserve the right to regrade the entire assignment/project/exam and thus your grade may go up or down.

In-Class Activities

In-class activities are very hands on in nature, where students will be expected to work with various examples and data sets based on instructions and class discussions.

After we complete the in-class activities during class, you are required to submit your own solutions in a single Word document through blackboard before the next class otherwise notified. The due date is the starting time of the next class. For instance, we had the in-class exercises on Wednesday, the due date for this exercise solutions is 9:00am Friday. The system will shut down on 9:00am sharp.

You are allowed to miss two submissions for in-class activities. Deliverables from in-class activities will be graded by **success or fail**. You will get score of 1 if you succeed and 0 if you fail. Answers to the exercises will be posted on the course website right after you submit yours. No late in-class exercises are accepted. Equipment failure is not an acceptable reason for turning in a deliverable late.

Class Presence and Participation

Class presence and participation points are given to encourage your active class participation and discussion. You will be rewarded with a perfect score if you frequently come to class and actively contribute to the class discussion.

Presence: You are allowed **two unexcused absence** without penalty. For example, if you miss a class because of a job interview or a meeting, it would count as unexcused absence. Excused absence is only allowed for extreme circumstances such as illness or family emergency and

requires documentation. If something keeps you from coming to class such as an illness or a family emergency, please contact me by e-mail as soon as possible.

Participation: Involvement during class is also important. Being present in class to ask and answer questions is essential to the learning process. Don't feel shy to speak up, ask questions or answer them. All students are expected to come prepared for the class and volunteer answers. I may also "cold call" students in class. However, note my policy is not to cold call students who are sitting in the front row. If something prevented you from being prepared for class on a particular day, you are invited to sit in the front row.

Classroom Etiquette

The environment you and your fellow students create in class directly impacts the value gained from the course. To that end, the following are my expectation of your conduct in this class:

- Arrive on time and stay until the end of class.
- Turn off cell phones, pagers and alarms while in class.
- Limit the use of electronic devices (e.g., laptop, tablet computer) to class-related usage such as taking notes. Restrict the use of an Internet connection (e.g., checking email, Internet browsing, sending instant messages) to before class, during class breaks, or after class.
- During class time speak to the entire class (or breakout group) and let each person "take their turn."
- Be fully present and remain present for the entirety of each class meeting.

Plagiarism and Academic Dishonesty

Plagiarism and academic dishonesty can take many forms. The most obvious is copying from another student's exam, but the following are also forms of this:

- Copying material directly, word-for-word, from a source (including the Internet)
- Using material from a source without a proper citation
- Turning in an assignment from a previous semester as if it were your own
- Having someone else complete your homework or project and submitting it as if it were your own
- Using material from another student's assignment in your own assignment

If you use text, figures, and data in reports that were created by someone other than yourself, you must identify the source and clearly differentiate your work from the material that you are referencing. There are many different acceptable formats that you can use to cite the work of others (see some of the resources below). You must clearly show the reader what is your work and what is a reference to somebody else's work.

Plagiarism and cheating are serious offenses. Penalties for such actions are given at my discretion, and can range from a failing grade for the individual assignment, to a failing grade for the entire course, to expulsion from the program.

Student and Faculty Academic Rights and Responsibilities

The University has adopted a policy on Student and Faculty Academic Rights and Responsibilities (Policy # 03.70.02) which can be accessed through the following link: http://policies.temple.edu/getdoc.asp?policy_no=03.70.02

Tentative Schedule

You are expected to review the assigned material for each class. Additional, supplementary material may be assigned throughout the course of the semester. Please get into the habit of checking the community site before each class to make sure you get the most out of class time.

Day	Topics	Assignments Due
Week 1		
Jan. 18	Course Introduction; The Things You Can Do with Data	
Jan. 20	The Information Architecture of an Organization	
Week 2		
Jan. 23	Relational Data Modeling : Data Modeling, Gathering requirements, Introducing ERD	
Jan. 25	In-class activity: Identifying entities and attributes	
Jan. 27	Relational Data Modeling : More on ERDs (Relationships, cardinality)	
Week 3		
Jan. 30	In-class activity: Creating an entity relationship diagram (ERD)	

	(Last day to add or drop a full-term course)	
Feb. 1	Relational Data Modeling : From ERDs to Schemas	
Feb. 3	In-class activity: Converting ERDs to schemas; MySQL quick demo	Assignment 1 Due: ER Modeling
Week 4		
Feb. 6	Review solution to Assignment 1; SQL 1: SQL SELECT, DISTINCT MIN, MAX, COUNT, and WHERE *Make sure you've reviewed the guide for setting up a connection in MySQL Workbench and reviewed the MySQL PowerPoint deck.*	
Feb. 8	In-class activity: Working with SQL, part 1	
Feb. 10	SQL 1: Joining tables, SQL subselects, LIMIT	
Week 5		
Feb. 13	In-class activity: Working with SQL, part 1 (Continued)	
Feb. 15	SQL 2: SQL CREATE, DROP, ALTER, INSERT, UPDATE, and DELETE	
Feb. 17	In-class activity: Working with SQL, part 2	Assignment 2 Due: SQL #1
Week 6		
Feb. 20	Review solution to Assignment 2; Review for Exam 1	
Feb. 22	**Exam 1**	
Feb. 24	Principles of Data Visualization	
Week 7		

Feb. 27	In-class activity: Data Visualization	Assignment 3 Due: SQL #2
Mar. 1	Review solution to Assignment 3; Extract, Transform, Load (ETL)	
Mar. 3	In-class activity: ETL in Excel	
Week 8		
Mar. 6	Dimensional Data Modeling: Overview	
Mar. 8	In-class activity: Pivot Tables in Excel	
Mar. 10	Dimensional Data Modeling: The Star Schema	Assignment 4 Due: ETL and Pivot tables in Excel
Week 9		
Mar. 13 Mar. 15 Mar. 17	Spring Break No Classes held	
Week 10		
Mar. 20	Review solution to Assignment 4; Review of Basic Statistics	
Mar. 22	Introduction to Advanced Analytics and R	
Mar. 24	In-class activity: Getting familiar with R and RStudio	Assignment 5 Due: Pivot Tables in Excel
Week 11		
Mar. 27	Review for Exam 2	
Mar. 29	**Exam 2**	
Mar. 31	Classification using Decision Trees	
Week 12		

Apr. 3	In-class activity: Decision trees in R	Assignment 6 Due: Introduction to working with R
Apr. 5	Review solution to Assignment 5; In-class activity: Decision trees in R	
Apr. 7	Clustering and Segmentation	
Week 13		
Apr. 10	In-class activity: Clustering and Segmentation in R	
Apr. 12	In-class activity: Clustering and Segmentation in R	Assignment 7 Due: Decision Trees
Apr. 14	Review solution to Assignment 6; Association Rule Mining	
Week 14		
Apr. 17	Review group project submissions	Assignment 8 Due: Clustering
Apr. 19	Review solution to Assignment 7; In-class activity: Computing Confidence, Support, and Lift	
Apr. 21	In-class activity: Association Rule Mining in R	
Week 15		
Apr. 24	Advanced topic	
Apr. 26	Advanced topic	Assignment 9 Due: Association Rules
Apr. 28	Review solution to Assignment 8; Review for Exam 3	