

MIS2502 Section 002 – Data Analytics

Spring 2018 (CRN: 19395)

About the Instructor

Jing Gong (gong@temple.edu)

Personal page: <http://community.mis.temple.edu/gong/>

Office: 201C Speakman Hall

Office hours: 12:50 – 1:50 PM Tuesdays and Thursdays or by appointment

Phone number: 215-204-6945

ITA

Nathan Pham (nathan.pham@temple.edu)

Aaron Cheng (acheng@temple.edu)

Class Location and Time

Location: Alter 232

Time: 3:30 - 4:50 PM Tuesdays and Thursdays

Course Websites

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

Website	Usage
MIS Community Site: http://community.mis.temple.edu/mis2502sec002004s18/	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.
Canvas: canvas.temple.edu	The Canvas site is primarily for assignment submission and sharing videos/recordings. The grades will also be posted on Canvas.

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.

Evaluation and Grading

Item	Percentage	Scale			
Exams (3)	60%	94 – 100	A	73 – 76.99	C
Assignments (9)	30%	90 – 93.99	A-	70 – 72.99	C-
In-class activities	5%	87 – 89.99	B+	67 – 69.99	D+
Presence & participation	5%	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: Tuesday 2/20 during class time
- Exam 2: Tuesday 3/27 during class time
- Exam 3: Thursday 4/26 during class time

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 **Canvas** before the due date.

They are to be done individually and should represent your own work. Please check the section "Plagiarism and Academic Dishonesty" for more details. If you need help, you may consult with your instructor or the ITA for the course.

#	Assignment
1	ER Modeling
2	SQL #1 – Getting Data out of the Database
3	SQL #2 – Putting Data into the Database
4	ETL in Excel
5	Pivot Tables in Excel
6	Introduction to working with R/RStudio
7	Decision Trees
8	Clustering
9	Association Rules

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.**

Please note:

- **Equipment failure is not an acceptable reason for turning in an assignment late.**
- In case the Canvas submission link does not work, you must send the submission to the instructor's email by the due date.
- For the assignment to be considered "on time," you must attach all necessary files specified in the assignment instructions by the due date. For any revisions or additional documents received after the due date, the usual late penalty applies.

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:

- Regrade requests must be submitted **within 1 week** of the date when the grade was returned.
- For assignment grades, regrade requests must be emailed to the instructor (not the ITA or grader) 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.
- For exam grades, regrade requests must be made during office hours.
- I reserve the right to regrade the entire assignment/ exam, and thus your grade may go up or down.

In-Class Activities

In-class activities (ICAs) 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.

ICAs are to be completed during class and submitted through **Canvas**.

- **You are allowed to miss two submissions for ICAs without penalty.** Deliverables from in-class activities will be graded by **success or fail**. Missed or late submissions will receive a zero (fail) grade.
- Equipment failure is not an acceptable reason for turning in an ICA 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:

- Unexcused absence: You are allowed **two unexcused absence** without penalty. For example, if you miss a class because of a job interview, contests or meetings related to professional development, it would count as an unexcused absence.
- Excused absence: An 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.
- The student who is absent for any reason is responsible for work missed
- If a pattern of excessive absences develops, the instructor may report this fact to the student's advisor through the department in which the student is enrolled.

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.

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 and alarms while in class.
- Limit the use of electronic devices (e.g., laptop, tablet computer) to class-related usage such as taking notes or working on in-class activities. 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 assignment or 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
- Submitting work done for a different course or section without the instructor's approval ahead of time
- Helping others to plagiarize or cheat, or doing the work of another person

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. 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.

For more specific definitions of cheating and plagiarism, please refer to the Temple University [Student Conduct Code \(policy # 03.70.12\)](#).

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	Week	Module	Topics	Assignments Due
1/16	1	0. Introduction	Course Introduction; The Things You Can Do with Data; The Information Architecture of an Organization	
1/18	1	1. Relational Data Modeling	Data Modeling, Gathering requirements, Introducing ERD; <u>In-class activity</u> : Identifying entities and attributes	
1/23	2	1. Relational Data Modeling	More on ERDs (Relationships, cardinality); <u>In-class activity</u> : Creating an entity relationship diagram (ERD)	
1/25	2	1. Relational Data Modeling	From ERDs to Schemas; <u>In-class activity</u> : Converting ERDs to schemas <i>(January 29 is the last day to add or drop a full term 16-week course)</i>	

Day	Week	Module	Topics	Assignments Due	
1/30	3	2. SQL 1 - Out	SQL SELECT, DISTINCT MIN, MAX, COUNT, and WHERE; <u>In-class activity</u> : Pen-and-paper SQL exercise <i>Make sure you've reviewed the guide for setting up a connection in MySQL Workbench and reviewed the MySQL PowerPoint deck.</i>	Assignment 1 Due: ER Modeling	
2/1	3	2. SQL 1 - Out	SQL 1 (Getting Data out of the database): Joining tables, SQL subselects, LIMIT; MySQL quick demo		
2/6	4	2. SQL 1 - Out	<u>In-class activity</u> : SQL Out (using MySQL Workbench)		
2/8	4	3. SQL 2 - In	SQL CREATE, DROP, ALTER, INSERT, UPDATE, and DELETE		
2/13	5	3. SQL 2 - In	<u>In-class activity</u> : SQL In (using MySQL Workbench)	Assignment 2 Due: SQL #1	
2/15	5	Review for Exam 1			
2/20	6	Exam 1			
2/22	6	4. ETL	Extract, Transform, Load (ETL); <u>In-class activity</u> : Excel Basics		
2/27	7	5. Dimensional Data Modeling	Overview, the Star Schema	Assignment 3 Due: SQL #2	
3/1	7	5. Dimensional Data Modeling	<u>In-class activity</u> : Pivot Tables in Excel		
3/6	8	No class (Spring Break)			
3/8	8	No class (Spring Break)			
3/13	9	6. Data Visualization	Principles of Data Visualization; <u>In-class activity</u> : Principles of Data Visualization	Assignment 4 Due: ETL in Excel	
3/15	9	6. Data Visualization 7. Introduction to Advanced Analytics and R	<u>In-class activity</u> : Creating an Infographic; Introduction to Advanced Analytics and R		

Day	Week	Module	Topics	Assignments Due	
3/20	10	7. Introduction to Advanced Analytics and R	<u>In-class activity</u> : Getting familiar with R and RStudio <i>(March 21 is the last day to withdraw from a Full Term 16-week course)</i>	Assignment 5 Due: Pivot Tables in Excel	
3/22	10	Review for Exam 2			
3/27	11	Exam 2			
3/29	11	8. Classification using Decision Trees	Classification using Decision Trees		
4/3	12	8. Classification using Decision Trees	<u>In-class activity</u> : Decision trees in R	Assignment 6 Due: Intro to R/RStudio	
4/5	12	9. Clustering	Clustering and Segmentation		
4/10	13	9. Clustering	<u>In-class activity</u> : Clustering and Segmentation in R	Assignment 7 Due: Decision Trees in R	
4/12	13	10. Association Rules	Association Rules; <u>In-class activity</u> : Computing Confidence, Support, and Lift		
4/17	14	10. Association Rules	<u>In-class activity</u> : Association Rules in R	Assignment 8 Due: Clustering in R	
4/19	14	11. Optional Module	Optional (Linear Regression)		
4/24	15	Review for Exam 3			Assignment 9 Due: Association Rules
4/26	15	Exam 3			