

MIS2502 Data Analytics – Section 003

Fall 2018 (CRN: 19563)

Syllabus version: 2 (as of 9/30/2018)

Monday/Wednesday/Friday, 3:00 - 3:50 PM @ ALTER 232

<p>Instructor:</p> <p>Aaron Zhi Cheng acheng@temple.edu</p> <p>Office: 201F Speakman Hall Office Hours: Mon: 3:50 pm – 4:50 pm Wed: 3:50 pm – 4:50 pm or by appointment</p>	<p>Teaching Assistant:</p> <p>Nathaly Gonzalez nathaly.gonzalez@temple.edu</p> <p><i>ITA will help with evaluating assignments, in-class activities, and exams, and may hold office hours if necessary.</i></p>
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Prerequisites:

Grade of C or better in MIS2101 (Information Systems in Organizations).

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 Canvas site. The detailed usage of the two sites is as follows.

Website	Usage
MIS Community Site: http://community.mis.temple.edu/mis2502sec003f18/	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.

Evaluation and Grading

Item	Percentage
Exams (3)	60%
Assignments (8)	24%
Group project	6%
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 and are subject to change.

- Exam 1: October 8, during class time
- Exam 2: November 2, during class time
- Exam 3: December 7, 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

Make-up exams will not be given under most circumstances out of fairness to all students taking the course. 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.

Group Project

There will be a group project released later in the semester. Students will be asked to analyze a data set from the *Temple Analytics Challenge* and to visualize their findings. Students should work in groups of 2 or 3. Members in the same group will receive the same grade.

Late Project Policy

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

Assignments

There will be eight assignments. **All assignments should be submitted via Canvas 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	September 17
2	SQL #1 – Getting Data out of the Database	September 26
3	SQL #2 – Putting Data into the Database	October 10
4	ETL and Pivot Tables in Excel	October 17
5	Introduction to working with R	November 7
6	Decision Trees	November 16
7	Clustering	November 28
8	Association Rules	December 3

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.

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 solutions through Canvas within the specified deadline.

Grading for In-Class Activities

- You are allowed to miss **two** submissions for in-class activities 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 a deliverable 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:

- Regrade requests must be submitted within 1 week of the date when the grade was returned.
- 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.
- For exam grades, regrade requests must be made during office hours.
- I reserve the right to regrade the entire assignment/project/exam and thus your grade may go up or down.

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 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.

You are expected to arrive on time and stay until the end of class. Otherwise, arriving late or leaving early can be considered absence as well.

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.

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 here: <http://guides.temple.edu/c.php?g=78108&p=508467>). 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 they 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

Disability Statement

Any student who has need of accommodation based on the impact of a disability should contact me privately to discuss the specific situation as soon as possible. Contact Temple University's Disability Resources and Services (DRS) office at (215)204-1280 at 100 Ritter Annex to coordinate accommodations for students with documented disabilities. Please contact your instructor and the DRS within the first week of class, at the beginning of the semester. DRS will establish your needs and make necessary arrangements with faculty. If you choose not to contact DRS, and have difficulty, you will be unable to receive accommodations retroactively, once exams are completed and/or course grades are submitted. Such decisions are made jointly between the DRS office and the instructor, at their discretion based on circumstances. Accommodation letters must be received by the instructor during the first two weeks of the semester.

Professional Achievement Point Requirement (MIS Majors Only)

The MIS department has instituted a professional achievement point requirement (link: <http://community.mis.temple.edu/professionalachievement/>) for MIS majors. We have found that our most successful students are not only engaged inside the classroom but also with the department and our Student Professional Organization, AIS. Students will be required to create a portfolio which documents their achievements in the classroom, with the department, and within AIS. For each addition to their portfolio, a student will earn some number of "professional achievement points". Students will be required to accumulate 1,000 professional achievement points to meet this graduation requirement.

MIS 2502 will serve as a checkpoint to ensure that students are focused on this requirement and on track to earn their 1,000 points by graduation.

All MIS majors are required to earn a minimum of 200 professional achievement points by the end of the semester. Students who have earned a "C" or better but do not earn the minimum number of professional achievement points by the end of the semester will receive an "Incomplete" for this course regardless of performance on exams or class participation!

If a student earns the minimum number of professional achievement points within one year from the end of the semester and notifies their instructor, the instructor will update their grade from "Incomplete" to a traditional grade.

If a student fails to earn the minimum number of professional achievement points within one year from the end of the semester or does not notify their instructor that they have earned the minimum number of professional achievement points then their "Incomplete" will be changed to an "F" automatically by the system and will be the student's permanent grade.

Class Schedule

The schedule (*tentative*) for lectures, in-class activities, assignments and exams is presented below. You are expected to review the assigned material for each class. 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.

Date	Module	Topic, Slide Deck and In-Class Activity	Assignment
Week 1			
Aug. 27	0.1. Course Introduction and Things You Can Do with Data (★★★★★)	-- Course Introduction [PowerPoint 0.1] -- The Things You Can Do with Data [PowerPoint 0.2]	
Aug. 29	0.2. Information Architecture of an Organization (★★)	-- The Information Architecture of an Organization [PowerPoint 0.3]	
Aug. 31	1. Relational Data Modeling (★★★★)	-- Data Modeling, Gathering requirements, Introducing ERD [PowerPoint 1.1]	
Week 2			
Sep. 3	Labor Day – No Class		
Sep. 5	1. Relational Data Modeling (★★★★)	<i>In-Class Activity #1.1: Identifying entities and attributes</i>	
Sep. 7		-- More on ERDs (e.g., Relationships, cardinality) [PowerPoint 1.1]	
Week 3			
Sep. 10	1. Relational Data Modeling (★★★★)	<i>In-Class Activity #1.2: Creating an entity relationship diagram (ERD)</i>	
*Last day to add or drop a full-term course			
Sep. 12		-- Converting ERDs to Schemas [PowerPoint 1.2]	
Sep. 14		<i>In-Class Activity #1.3: Converting ERDs to schemas</i>	

Week 4			
Sep. 17	2. SQL 1 – Out (★★★★★)	-- Getting data out of a database: SQL SELECT, DISTINCT MIN, MAX, COUNT, and WHERE [PowerPoint 2.1] <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
Sep. 19		-- MySQL quick demo [PowerPoint 2.1] [PowerPoint 2 Supplement] <i>In-Class Activity #2.1: Working with SQL, part 1</i>	
Sep. 21		-- Joining tables, SQL subselects, LIMIT [PowerPoint 2.2]	
Week 5			
Sep. 24	2. SQL 1 – Out (★★★★★)	<i>In-Class Activity #2.2: Working with SQL, part 1</i>	
Sep. 26	3. SQL 2 – In (★★★)	-- Creating and updating the database: SQL CREATE, DROP, ALTER, INSERT, UPDATE, and DELETE [PowerPoint 3]	
Sep. 28		<i>In-Class Activity #3: Working with SQL, part 2</i>	Assignment 2 Due: SQL #1 (before class)
Week 6			
Oct. 1	4. ETL (★★)	-- Extract, Transform, Load (ETL) [PowerPoint 4]	
Oct. 3		<i>In-Class Activity #4: Excel Basics</i>	
Oct. 5		Review for Exam 1	

Week 7			
Oct. 8		Exam 1 (★★★★★)	
Oct. 10	5. Dimensional Data Modeling (★★)	-- Dimensional Data Modeling Overview [PowerPoint 5]	Assignment 3 Due: SQL #2
Oct. 12		<i>In-Class Activity #5: Pivot Tables in Excel</i>	
Week 8			
Oct. 15	5. Dimensional Data Modeling (★★)	-- Dimensional Data Modeling: The Star Schema [PowerPoint 5]	
Oct. 17	6. Data Visualization (★★★★)	-- Principles of Data Visualization [PowerPoint 6]	Assignment 4 Due: ETL and Pivot Tables in Excel
Oct. 19		<i>In-Class Activity #6.1: Data Visualization Principles</i>	
		<i>In-Class Activity #6.2: Creating Infographics</i>	
Week 9			
Oct. 22	7. Introduction to Advanced Analytics and R (★★★★)	-- Supplement materials: Review of Basic Statistics [PowerPoint 7 Supplement]	
<i>*Tuesday (Oct 23) is the last day to withdraw a full-term course</i>		-- Introduction to Advanced Analytics [PowerPoint 7.1]	
Oct. 24		-- Introduction to R and R Studio [PowerPoint 7.2]	
Oct. 26			
Week 10			
Oct. 29	7. Introduction to Advanced Analytics and R (★★★★)	<i>In-Class Activity #7: Getting familiar with R and RStudio</i>	<u>Group Project Due: Data Visualization</u>
Oct. 31		Review for Exam 2	
Nov. 2		Exam 2 (★★★★)	

Week 11			
Nov. 5	8. Classification Using Decision Tree (★★★)		
Nov. 7		-- Classification using Decision Trees [PowerPoint 8] <i>In-Class Activity #8: Decision Trees in R</i>	Assignment 5 Due: Introduction to R
Nov. 9		<i>In-Class Activity #8: Decision Trees in R</i>	
Week 12			
Nov. 12	9. Clustering (★★★)	-- Clustering [PowerPoint 9]	
Nov. 14		<i>In-Class Activity #9: Clustering and Segmentation in R</i>	Assignment 6 Due: Decision Trees
Nov. 16		<i>In-Class Activity #9: Clustering and Segmentation in R</i>	
Week 13			
Nov. 19~25	Fall Break & Thanksgiving Holiday – No class		
Week 14			
Nov. 26		Review group project submissions	
Nov. 28	10. Association Rules (★★★)	-- Association Rules [PowerPoint 10]	Assignment 7 Due: Clustering
Nov. 30		<i>In-Class Activity #10.1: Computing Confidence, Support & Lift</i>	
Week 15			
Dec. 3	10. Association Rules (★★★)	<i>In-Class Activity #10.2: Association Rule Mining in R</i>	Assignment 8 Due: Association Rules
Dec. 5		Review for Exam 3	
Dec. 7		Exam 3 (★★★★★)	

*** More ★ indicate that you need to take more efforts.