

MIS2502 Data Analytics – Section 001/003

Syllabus version: 5 (as of 4/15/2018)

Class Schedule & Room:

Section 1: Mondays, Wednesdays and Friday, 9:00AM - 9:50AM / ALTER 231

Section 3: Mondays, Wednesdays and Friday, 3:00PM - 3:50PM / ALTER 232

First class: Wednesday, Jan 17, 2018

<p>Instructor: JaeHwuen Jung E-mail: jaejung@temple.edu</p> <p>Please put [MIS2502- Section#] into the subject line</p> <p>Office: 201E Speakman Hall Office Hours: Section 1: M.W. 10:00 – 11:00 am Section 3: M.W. 1:30 – 2:30 pm</p>	<p>Teaching Assistant:</p> <p>Section 1: Michelle Purnama tug77247@temple.edu</p> <p>Section 3: Jiawei Huang tug14575@temple.edu</p> <p>Please put [MIS2502] into the subject line</p> <p><i>(ITA will be responsible for grading assignments, ICAs, and exams)</i></p>
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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 Canvas site. The detailed usage of the two sites is as follows.

Website	Usage
MIS Community Site: http://community.mis.temple.edu/mis2502sec001003s18/	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	Scale			
Exams (3)	65%	94 – 100	A	73 – 76.99	C
Assignments (9)	27%	90 – 93.99	A-	70 – 72.99	C-
In-class activities	8%	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: 2/21 during class time
- Exam 2: 3/28 during class time
- Exam 3: 4/30 during class time

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

Makeup Exams

Makeup exams present a number of logistical challenges. Out of fairness to all students taking the course, makeup examinations will only be given in accordance with the official University policy. 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 due date.** They are to be done individually and should represent your own work. 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
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

Instructor and the ITA will 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 ITA 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, you are required to submit your solutions through Canvas by the end of the class unless otherwise notified.

You are allowed to miss two submissions for in-class activities. 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.

Class Participation

Participation: I strongly encourage your active class participation and discussion. 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

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 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 ***tentative schedule*** for the topics is presented below. 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	Course Materials	Assignments
Week 1			
Jan. 17	Course Introduction and Syllabus The Things You Can Do with Data.	PowerPoint: The Things You Can Do with Data	
Jan. 19	The Information Architecture of an Organization.	PowerPoint: Information Architecture	
Week 2			
Jan. 22	Data Modeling Gathering requirements: Introducing Entity-Relationship Diagram	PowerPoint: Relational Data Modeling	
Jan. 24	In-class exercise: Identifying entities		
Jan. 26	More on ERDs: Relationships, cardinality	PowerPoint: Relational Data Modeling	
Week 3			
Jan. 29	In-class exercise: Creating an entity relationship diagram (Last day to add or drop a full-term course)		
Jan. 31	From ERDs to Schemas: Normalization, primary/foreign keys, joins	PowerPoint: Relational Data Modeling	Assignment 1 Due: ER Modeling
Feb. 2	In-class exercise: Converting ERDs to schemas		
Week 4			
Feb. 5	Getting data out of the database: SQL SELECT, DISTINCT MIN, MAX, COUNT, and WHERE <i>Make sure you've reviewed the guide for setting up a connection in MySQL Workbench and reviewed the MySQL PowerPoint deck.</i>	PowerPoint: SQL 1	
Feb. 7	In-class exercise: Working with SQL, part 1		
Feb. 9	Getting data out of the database: Joining tables, SQL subselects, LIMIT	PowerPoint: SQL 1	
Week 5			
Feb. 12	In-class exercise: Working with SQL, part 1 (Continued)		
Feb. 14	Creating and updating the database SQL CREATE, DROP, and ALTER SQL INSERT, UPDATE, and DELETE	PowerPoint: SQL 2	Assignment 2 Due: SQL #1
Feb. 16	In-class exercise: Working with SQL, part 2		

Week 6			
Feb. 19	Review for Exam 1		
Feb. 21	Exam 1		
Feb. 23	In-class exercise: Working with SQL, part 2		
Week 7			
Feb. 26	Principles of Data Visualization	PowerPoint: Data Visualization	
Feb. 28	In-class exercise: Data Visualization		
Mar. 2	Getting data into the analytical database: The Extract, Transform, Load process	PowerPoint: ETL	Assignment 3 Due: SQL #2
Week 8			
Mar. 5	Spring Break – No Class		
Mar. 7			
Mar. 9			
Week 9			
Mar. 12	In-class exercise: ETL in Excel		
Mar. 14	Turning transaction data into analytical data: Overview of the Dimensional Model	PowerPoint: Dimensional Data Modeling	
Mar. 16	In-class exercise: Pivot Tables in Excel		Assignment 4 Due: ETL in Excel
Week 10			
Mar. 19	In-class exercise: Pivot Tables in Excel Descriptive Statistics Review	PowerPoint: Supplement - Basic Statistics	
Mar. 21	Introduction to Advanced Analytics and R	PowerPoint: Advanced Analytics – Introduction	
Mar. 23	Review for Exam 2 – SQL		Assignment 5 Due: Pivot tables in Excel
Week 10			
Mar. 26	Review for Exam 2 In-class exercise: Getting familiar with R and RStudio Part 1		
Mar. 28	Exam 2		
Mar. 30	In-class exercise: Getting familiar with R and RStudio Part 1		
Week 11			
Apr. 2	In-class exercise: Getting familiar with R and RStudio Part 2		
Apr. 4	Classification using Decision Trees	PowerPoint: Classification using Decision Trees	
Apr. 6	In-class exercise: Decision trees in R		Assignment 6 Due: Introduction to working with R

Week 12			
Apr. 9	In-class exercise: Decision trees in R		
Apr. 11	Analysis Scenario: Identifying similar customers (clustering and segmentation)	PowerPoint: Clustering and Segmentation	
Apr. 13	In-class exercise: Clustering and Segmentation in R		Assignment 7 Due: Decision Trees in R
Week 13			
Apr. 16	In-class exercise: Clustering and Segmentation in R		
Apr. 18	Analysis Scenario: What products are purchased together? (Association Rules)	PowerPoint: Association Rule Mining	
Apr. 20	In-class exercise: Computing Confidence, Support, and Lift		Assignment 8 Due: Clustering
Week 14			
Apr. 23	In-class exercise: Association Rule Mining in R		
Apr. 25	Advanced topic - Data Visualization in R		
Apr. 27	Review for Exam 3		Assignment 9 Due: Association Rules
Week 15			
Apr. 30	Exam 3		Bonus Assignment Due (4/28)