Business Intelligence

COSC 4347 and 5347

Spring 2022

Course Description

Prerequisites for Undergraduates: COSC 1342 and COSC 1343. Creating value from business data by converting it into meaningful and useful information for business decision making by using current industry business intelligence (BI) and business analytics (BA) tools and technologies.

Class Time

Tues and Thurs   11:00am – 12:20pm   COB 211

Instructor Information

Dr. Robert P. Schumaker
Professor, Computer Science Dept.
rschumaker@uttyler.edu

Office Hours

DM through Slack (preferred), Zoom, email
    If your inquiry is grade-related, please make a Zoom appointment.
Because of University regulations regarding Covid-19, there will be **no** physical office hours this semester.

Textbook Information

Data Mining and Business Analytics with R (Ledolter, 2013)   ISBN: 978-1-118-44714-7

Course Objective

This course is designed with the following goals:
- Identify the appropriate analytical tool based on the problem type and characteristics
- Properly conduct a collection and analysis of big-data
- Relate the tools learned to appropriate classes of problems
- Analyze a variety of business datasets for non-trivial patterns
- Predict future trends based on historical data
- Interpret results and appropriately explain them to business managers

Computer Account Access

Students will need a Patriot account and password for computer access. This information can be found at http://www.uttyler.edu/ccs

Course Documents and Slides

This class will use Canvas for course documents, slides and other class-related materials. Students are encouraged to check the website frequently during the course of the semester to keep up to date about course changes.

Business Intelligence

COSC 4347 and 5347

Spring 2022

Course Grading

COSC 4347 (Undergraduate):			COSC 5347 (Graduate):	
Homeworks	20		Homeworks	20
MidTerm I	20		MidTerm I	20
MidTerm II	20		MidTerm II	20
Final Exam	20		Final Exam	20
Participation	10		Participation	10
Lifelong Learning	10		Semester Project	10
Total Points	100		Total Points	100

Grading Scale

A	85.0 points or more
B	70.0 to 84.999 points
C	55.0 to 69.999 points
D	40.0 to 54.999 points
F	39.999 points or less

This grading scale is fixed and immutable. While heart-breaking, the Instructor is not responsible for the following consequences for bad grades as reported by former students: assault by family member, delayed graduation, deportation, homelessness, failure to attend grad school, loss of significant other, crushing their hopes and dreams. Grades are not curved, individual extra credit is not offered and any requests to unethically "adjust" grades will be reported to the University as an incident of academic dishonesty. **Students are encouraged to check their grades often and are responsible for all deadlines.**

Course Policies

1. Homeworks – Various homeworks will be assigned this semester. Each homework will prepare the student in exercising their analytical skills and demonstrate material mastery.

2. Exams – Three exams including a comprehensive final will be administered covering all material disseminated through the assigned readings as well as what was discussed in class. Exams are designed to measure the student's knowledge of the material as well as their ability to use these skills in an efficient manner. Examinations may consist of multiple choice questions or application problems.

3. Class Participation – Class Participation points will be scored by the quantity of quality discussion a student contributes regarding relevant technology-related articles. The maximum points that can be earned is ten.

4. Lifelong Learning – It is imperative for successful individuals to continue learning throughout their lifetime. Professional organizations are a wonderful opportunity to reinvent, retool and build connections with industry leaders. Students that attend a professional technology organization meeting (and email proof of attendance) will receive credit. Upcoming meetings and events can be found on Canvas. Online webinars will be accepted.

5. Make-up exams will be granted at the discretion of the instructor. Make-ups will be given only under extremely unusual circumstances, will be different from exams given during the regular class time and may be penalized up to 50% of the grade. *Permission for a makeup exam must be obtained **PRIOR** to the regular exam and must include written documentation of the student's absence*.

6. Missed Classes, Tests/Quizzes and Assignments – Students who miss class are responsible for getting missed materials and lecture information on their own time from their peers. Any tests/quizzes and/or assignments due during the student's documented absence will be due by 5pm of the day of their return with no penalty.

7. Time Outside of Class – This course is a computer application course that requires students to complete computer application exercises and projects. It is the responsibility of the student to make a **backup** of all assignments or application projects. *If your work is not saved and accessible by the instructor, then it cannot be evaluated and a grade of F will be given for that particular project or assignment.* BACKUPS of projects and tests are imperative in order to avoid lost or damaged data.

8. The Harvard CS50 Regret Clause – If you commit some act that is not reasonable but bring it to the attention of the course's heads within 72 hours, the course may impose local sanctions that may include an unsatisfactory or failing grade for work submitted, but the course will not refer the matter for further disciplinary action except in cases of repeated acts. Below are rules of thumb that (inexhaustively) characterize acts that the course considers reasonable and not reasonable. If in doubt as to whether some act is reasonable, do not commit it until you solicit and receive approval in writing from the course's heads. Acts considered not reasonable by the course are handled harshly. If the course refers some matter for disciplinary action and the outcome is punitive, the course reserves the right to impose local sanctions on top of that outcome that may include an unsatisfactory or failing grade for work submitted or for the course itself. The course ordinarily recommends exclusion (i.e., required withdrawal) from the course itself.

Reasonable
- Communicating with classmates about problem sets' problems in English (or some other spoken language), and properly citing those discussions.
- Discussing the course's material with others in order to understand it better.
- Helping a classmate identify a bug in their code at office hours, elsewhere, or even online, as by viewing, compiling, or running their code after you have submitted that portion of the pset yourself. Add a citation to your own code of the help you provided and resubmit.
- Incorporating a few lines of code that you find online or elsewhere into your own code, provided that those lines are not themselves solutions to assigned problems and that you cite the lines' origins.
- Reviewing past semesters' tests and quizzes and solutions thereto.
- Sending or showing code that you've written to someone, possibly a classmate, so that they might help you identify and fix a bug.
- Submitting the same or similar work to this course that you have submitted previously to this course.
- Turning to the course's heads for help or receiving help from the course's heads during the quizzes or test.
- Turning to the web or elsewhere for instruction beyond the course's own, for references, and for solutions to technical difficulties, but not for outright solutions to problem set's problems or your own final project.
- Whiteboarding solutions to problem sets with others using diagrams or pseudocode but not actual code.
- Working with (and even paying) a tutor to help you with the course, provided the tutor does not do your work for you.

Not Reasonable
- Accessing a solution to some problem prior to (re-)submitting your own.
- Accessing or attempting to access, without permission, an account not your own.

- Asking a classmate to see their solution to a problem set's problem before (re-)submitting your own.
- Discovering but failing to disclose to the course's heads bugs in the course's software that affect scores.
- Decompiling, deobfuscating, or disassembling the staff's solutions to problem sets.
- Failing to cite (as with comments) the origins of code or techniques that you discover outside of the course's own lessons and integrate into your own work, even while respecting this policy's other constraints.
- Giving or showing to a classmate a solution to a problem set's problem when it is they, and not you, who is struggling to solve it.
- Looking at another individual's work during the quizzes or test.
- Manipulating or attempting to manipulate scores artificially, as by exploiting bugs or formulas in the course's software.
- Paying or offering to pay an individual for work that you may submit as (part of) your own.
- Providing or making available solutions to problem sets to individuals who might take this course in the future.
- Searching for or soliciting outright solutions to problem sets online or elsewhere.
- Splitting a problem set's workload with another individual and combining your work.
- Submitting (after possibly modifying) the work of another individual beyond the few lines allowed herein.
- Submitting the same or similar work to this course that you have submitted or will submit to another.
- Submitting work to this course that you intend to use outside of the course (e.g., for a job) without prior approval from the course's heads.
- Turning to humans (besides the course's heads) for help or receiving help from humans (besides the course's heads) during the quizzes or test.
- Viewing another's solution to a problem set's problem and basing your own solution on it.

Tentative Course Schedule and Assignments:

Scheduled dates may vary depending on the pace of the class.

Date	Concept	Assignment Due	Quizzes
Jan 11	Introduction to Business Intelligence	Arnyg Analytical	
Jan 13	A Data Science Overview	Learning Quizzes I & II	
Jan 18	Basic Statistics Overview	Patterns and Me	
Jan 20	Using Excel for Statistics		
Jan 25	Introduction to R	RBN Art	Chapter 1, 2
Jan 27	Linear Regression		Chapter 3
Feb 1	Polynomial and Multiple Regression	R Basics	Chapter 4
Feb 3	Time-Series Analysis	Multiple Regression	
Feb 8	Measures of Correlation	Stock Smoothing	
Feb 10	Analysis of Variance (ANOVA)		
Feb 15	Clean and Analyze Data	Midterm I	
Feb 17	Data Visualization		
Feb 22	Visualization with R		
Feb 24	Optimization and Linear Programming		
Mar 1	LP Exercises		
Mar 3	LP Exercises Presentation	Linear Programming	
Mar 8	No Classes – Spring Break		
Mar 10	No Classes – Spring Break		
Mar 15	Logistic Regression and Binary Classification		Chapter 7, 8
Mar 17	Introduction to Data Mining	Midterm II	
Mar 22	Clustering and kNN		Chapter 9, 15
Mar 24	Decision Trees		Chapter 13
Mar 29	Naive Bayes		Chapter 10
Mar 31	Genetic Algorithms		
Apr 5	Neural Networks		
Apr 7	Support Vector Machines		
Apr 12	Machine Learning Exercises		
Apr 14	Text Analytics		Chapter 19
Apr 19	Project Work Day		
Apr 21	Research Talk – Classes Choice		