



Business Intelligence

COSC 4347 and 5347

Spring 2020

### 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/Thurs 11:00am – 12:20pm COB 255

\*Note: This is a hybrid course section. Class meeting times are listed on the last page of the syllabus.

### Instructor Information

Dr. Robert P. Schumaker  
Professor, Computer Science Dept.  
COB 315.05  
rschumaker@uttyler.edu

### Office Hours

Tues and Thurs 12:30pm – 2:00pm on class meeting weeks in COB 315.05

Tues and Thurs 12:30pm – 2:00pm on class meeting weeks through Canvas

If these times don't work for you, please make an appointment.

Appointments outside of office hours can be made at [robschumaker.youcanbook.me](http://robschumaker.youcanbook.me)

### 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.



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**Course Grading**

COSC 4347 (Undergraduate):		COSC 5347 (Graduate):	
Homework I	10	Homework I	10
Homework II	10	Homework II	10
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
<b>Total Points</b>	<b>100</b>	<b>Total Points</b>	<b>100</b>

**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

**Course Policies**

1. Analytics Aptitude Assessment – Students are encouraged to take the Aryng’s Analytical Aptitude Assessment at <http://aryng.com/aryngs-analytical-aptitude-assessment/> and upload their results in Canvas before the beginning of the second class. This assessment will help the instructor in identifying analytical weaknesses that require more thorough explanation.
2. Homeworks – Two homeworks will be assigned this semester. Each homework will prepare the student in exercising their analytical skills and demonstrate material mastery.
3. 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.
4. Class Participation – Class Participation points are broken up into two parts; tech stories (Tech) and operating the teaching workstation (Workstation). Participation.Tech will be scored by the quantity of quality discussion a student contributes regarding relevant technology-related articles. Participation.Workstation will be scored as to whether the student voluntarily operates the teaching workstation. The exact formula of Class Participation points will not be revealed until the end of the semester and the maximum points that can be earned is ten.
5. 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 bring proof of attendance) will receive credit. Upcoming meetings and events can be found on Canvas.
6. 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.*



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7. Late Assignments – Assignments are due by 5:00pm of the date assigned. Assignments that are turned in late will be penalized by 20% for each 24 hour period (5:01pm to 5:00pm the following day) past the deadline and will receive a zero if turned in more than 5 calendar days late. Electronic assignments are encouraged to be sent electronically.
8. 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 excused absence will be due by 5pm of the day of their return with no penalty. Late assignment grading will be applied thereafter.
9. 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.
10. 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.



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### 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.

### Classroom Lab Rules

1. Please do not surf the Web during class unless instructed to access the Internet.
2. Do not access inappropriate Web sites during class. This will lead to dismissal from the class.
3. Please do not work on other computer assignments during class.
4. Please do not talk to your neighbor during class.
5. Do not use the printer during class.
6. Please do not bring food or an uncovered drink into the computer classroom lab.
7. Do not use your phone during class.

### University Policies and Additional Information that Must Appear in Each Course Syllabus (5/19)

#### UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

#### Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www.uttyler.edu/wellness/rightsresponsibilities.php>



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### **Campus Carry**

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>

### **UT Tyler a Tobacco-Free University**

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products.

There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit [www.uttyler.edu/tobacco-free](http://www.uttyler.edu/tobacco-free)

### **Grade Replacement/Forgiveness and Census Date Policies**

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

### **State-Mandated Course Drop Policy**

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university.

For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.



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### **Disability/Accessibility Services**

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including non-visible disabilities such as learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150 or call 903.566.7079.

### **Student Absence due to Religious Observance**

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

### **Student Absence for University-Sponsored Events and Activities**

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

### **Social Security and FERPA Statement**

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

### **Emergency Exits and Evacuation**

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

### **Student Standards of Academic Conduct**

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

- i. "Cheating" includes, but is not limited to:
  - copying from another student's test paper;
  - using, during a test, materials not authorized by the person giving the test;
  - failure to comply with instructions given by the person administering the test;
  - possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
  - using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;





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- collaborating with or seeking aid from another student during a test or other assignment without authority;
  - discussing the contents of an examination with another student who will take the examination;
  - divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
  - substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
  - paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
  - falsifying research data, laboratory reports, and/or other academic work offered for credit;
  - taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
  - misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.
- ii. “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.
- lii. “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.
- iv. All written work that is submitted will be subject to review by plagiarism software.

#### **UT Tyler Resources for Students**

- UT Tyler Writing Center (903.565.5995), [writingcenter@uttyler.edu](mailto:writingcenter@uttyler.edu)
- UT Tyler Tutoring Center (903.565.5964), [tutoring@uttyler.edu](mailto:tutoring@uttyler.edu)
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)



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**Tentative Course Schedule and Assignments:**

Date	Concept	Assignments	Readings
Jan 14	Introduction to Business Intelligence		
Jan 16	A Data Science Overview	Analytical Assessment	
Jan 21	Basic Statistics Overview		
Jan 23	Using Excel for Statistics	Completed Handouts	
Jan 28	Introduction to R		Chapter 1, 2
Jan 30	Linear Regression		Chapter 3
Feb 4	Polynomial and Multiple Regression		Chapter 4
Feb 6	Time-Series Analysis		
Feb 11	Measures of Correlation		
Feb 13	Analysis of Variance (ANOVA)		
Feb 18	Midterm I	Homework I	
Feb 20	Clean and Analyze Data		
Feb 25	Data Visualization		
Feb 27	Visualization with R		
Mar 3	Introduction to Tableau		
Mar 5	Optimization and Linear Programming		
Mar 10	No Classes – Spring Break		
Mar 12	No Classes – Spring Break		
Mar 17	LP Exercises		
Mar 19	Logistic Regression and Binary Classification		Chapter 7, 8
Mar 24	Midterm II	Homework II	
Mar 26	Introduction to Data Mining		
Mar 31	k-Nearest Neighbor		Chapter 9
Apr 2	Clustering		Chapter 15
Apr 7	Decision Trees		Chapter 13
Apr 9	Naive Bayes		Chapter 10
Apr 14	Genetic Algorithms		
Apr 16	Neural Networks		
Apr 21	Support Vector Machines		
Apr 23	Text Analytics		Chapter 19

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