

DSBA/MBAD 6211 U01/U90
Advanced Business Analytics
UNC Charlotte
Spring 2020

Instructor: Dr. Kexin Zhao
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Class Hours: Tuesday

Classroom: Center City 801
Office Hours: Monday 9:00-12:00 in my office, right before class in Center City, or by appointment
Website: Canvas

Course Description

This course is designed to help students apply business analytics techniques to explore and analyze various types of data, so they can find subtle and non-trivial relationships that are understandable, useful, and executable to business owners. Managers in various functional areas can exploit valuable insights gained via fact-based decision-making to achieve competitive advantages. Specific topics covered in this course include *predictive modeling*, *experimentation*, *survival analyses*, *text mining*, *forecasting*, and *social network analytics*. This course uses a case approach and *R* is the main analytical tool.

Learning Objectives

This course aims at business managers, information professionals, data analysts, as well as general audience who are interested in applying data analytics techniques to discover non-trivial relationships and to summarize data in novel ways that are understandable, useful, and executable to business owners.

This course will examine principles, ideas, and data analytics tools underlying the current practice of data mining. Specifically, students will understand basics of predictive modeling, experimentation, survival analyses, text mining, forecasting, and social network analytics. By understanding business analytics at the practical and non-highly-mathematical level, students will be able to translate information into decisions and convert information about past performance into reliable forecasts.

This course will develop understanding of practical applicability of analytics methods in a variety of business scenarios. This course will not just describe/explain the end results, but also discuss the process of formulating/refining business objectives, data selection, data preparation, model selection and evaluation that lead to the results. The students will learn how to formulate analytic tasks in support of business objectives, how to define successful projects, and how to evaluate utility of existing and potential applications of discussed technologies in practice.

This course will take a case approach, complemented by lectures, seminar style discussion, outside speakers, and lab work. This course will use statistical software R for hands-on experimentation with various analytics techniques.

Course Materials

Handouts, power-point slides, assignments, and additional helpful resources will be posted on Canvas. You can print the posted material and bring them to class. Please note that I will not provide printed copies of the posted materials in the class.

Software: R/R Studio

Recommended references:

- *An Introduction to Statistical Learning with Applications in R*, by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani. Freely available at: <http://faculty.marshall.usc.edu/gareth-james/ISL/>
- *Data Mining for Business Analytics (R Edition 2017)*, by Galit Shmueli, Peter Bruce, Inbal Yahav, Nitin Patel, Kenneth Lichtendahl. (ISBN-10: 1118879368)

Grading

Component	Percentage
Two exams (2 @ 27.5%)	55%
Group project	25%
Assignments (4 @ 5%)	20%
Total	100%

Final letter grade will be calculated based on the following scale:

A: 90 and above; B: 80-89.9; C: 70-79.9; D: 60-69.9; E: 59.9 and below.

The course grades are posted on Canvas for informational purposes only. The official overall grade is computed and kept in the instructor's grade book.

Exams

Exams are **closed** book and notes when they are administered in class. Questions on the exams will be taken from the assigned readings of texts, class lectures, and assignments.

If the answer to an exam question is disputed, the student should submit a written appeal, citing the source to the instructor. The instructor will take these appeals into account during grading.

Exams are a form of intellectual property belonging to those who create them. Consequently, exams must remain in my possession or under my control at all times. This means that exams may not be taken out of the room or copied. Students are encouraged to review their exams during office hours or by appointment. However, failure to return an exam after taking or reviewing it or removing an exam from my presence at any time or copying an exam will be considered theft of intellectual property. Such action will result in an exam grade of zero and may warrant further disciplinary action.

Missed exams

In the event that the excuse is **approved before the exam date** (a rare case and requires documentation), the student will be given a make-up exam.

Assignments

Students need to complete four **individual** assignments during the course of the semester. These assignments will be submitted **on Canvas before 5:00pm on the due date**. Assignments submitted after the due date will be considered late. A penalty of **20% of the assignment value per day** (including weekends) is assessed on late assignments beginning on the due date.

You must complete each assignment on your own. Any sharing between students will be considered a violation of the Academic Integrity Code and will result at a minimum in a grade of zero for the assignment with a possibility for further disciplinary action.

All changes in assignments or schedules will be posted on Canvas. It is your responsibility to keep up with the changes that are posted on Canvas.

Group Project

Students will form a group of 3-5 members to complete a business analytics project. Details will be made available via Canvas. If possible, all teams should be comprised of students from different disciplines/backgrounds, so please keep this in mind this when selecting your team members. I reserve the right to arrange/rearrange team assignments.

If a group member does not contribute, the rest of the members may, after a consensus agreement, ask him/her to leave the group and notify the instructor. The maximum project grade for students not belonging to a group will be 80. If necessary, peer reviews will be factored into the grade.

No more than 2 teams could work on the same dataset. The topic selection is first come, first served.

Class Policies

Attendance and Participation Policy

Attendance and participation are required and tardiness or early departure is disruptive and is, of course, discouraged. Students will be held responsible for any material covered,

announcements made, assignments passed out, and any other type of work that they may miss during any absence from class.

Class Behavior Policy

Inappropriate behavior distracts from the ability of others to profit from their in-class experience. Such behavior includes arriving late, leaving early, talking, surfing the net, and so on.

Rude and inappropriate behavior **will not be tolerated**. Since it is my responsibility to provide an environment that is conducive to learning for everyone in the class, I will deduct points from the grade of any student who chooses to repeatedly distract others. In particularly egregious cases, I will have the student permanently removed from the class.

Under no circumstances will students be permitted to spend their lab time working on assignments for other classes, checking e-mail, surfing the Web, or printing out homework. Attempts to engage in such behavior will be reflected in lower grades and may lead to removal from the course.

Electronic Devices in Class

Use of cellular phones, pagers, music players, radios, and similar devices are prohibited in the classroom and laboratory facilities. Cellular phones **MUST BE TURNED OFF DURING CLASS**, except in cases of medical emergencies. Pagers must be set to vibrate, rather than beep. Calculators and computers are prohibited during examinations and quizzes, unless specified. Laptop-size computers may be used in lecture for the purpose of taking notes. **Use of instant messaging, email or other communication technologies during class time is prohibited.** Use of computing devices for purposes other than those required for the purposes of the class topic are prohibited. This includes use of laptops, lab computers, phones or other devices for Internet browsing, game playing, reading news, texting, chatting, IM and other activities not required for the class.

Grade Appeals Policy

If you believe that the grade you received on an assignment or an exam was in error or unfair, you can appeal to the professor **in writing within 7 calendar days after the grades are posted**. The appeal should clearly state the reasons why you believe the grade to be unfair or the nature of the error. Overdue appeals will not be considered.

Academic Integrity

As a program that helps to create business and government leaders, the College of Business has an obligation to ensure academic integrity is of the highest standards. Standards of academic integrity will be enforced in this course.

University regulations will be strictly enforced in all cases of academic irregularities, cheating or plagiarism or any variations thereof. Students assume full responsibility for the content and integrity of the academic work they submit. The guiding principle of academic integrity shall be that a student's submitted work, examinations, reports, and projects must be his/her own work.

All UNCC students have the responsibility to be familiar with and to observe the requirements of The **UNCC Code of Student Academic Integrity** (see the Catalog and also <http://integrity.uncc.edu/>). This code forbids cheating, fabrication or falsification of information, multiple submission of academic work, plagiarism of written materials and software projects, abuse of academic materials (such as library books on reserve), and **complicity in academic dishonesty** (helping others to violate the code). Additional examples of violation of the Code include:

- Representing the work of others as your own.
- Using or obtaining unauthorized assistance in any academic work.
- Giving unauthorized assistance to other students.
- Modifying, without instructor approval, an examination, paper, record, or report for the purpose of obtaining additional credit.
- Misrepresenting the content of submitted work.

Students are expected to report cases of academic dishonesty they become aware of to the course instructor who is responsible for dealing with them.

For this course, it is permissible to assist classmates in general discussions about the homework. General advice and interaction are encouraged. Each person, however, must develop his or her own solutions to the assigned homework and laboratory exercises. Students may not "work together" on graded assignments. Such collaboration constitutes cheating, unless it is a group assignment. A student may not use or copy (by any means) another's work (or portions of it) and represent it as his/her own. If you need help on an assignment, contact your instructor or the TA, not other classmates.

Any further specific requirements or permission regarding academic integrity in this course will be stated by the instructor, and are also binding on the students in this course.

Students who violate the code can be punished to the extent of being permanently expelled from UNCC and having this fact recorded on their official transcripts. The normal penalty is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases, the course grade is reduced to "F."

If you are unclear about whether a particular situation may constitute an honor code violation, you should meet me to discuss the situation. Feel free to discuss the definition of cheating and/or plagiarism with me if you are unclear on these terms or have questions about the acceptability of a particular type of action.

The instructor may ask students to produce identification at examinations and may require students to demonstrate that graded assignments completed outside of class are their own work.

Disability Accommodations

UNC Charlotte is committed to access to education. If you have a disability and need academic accommodations, please provide a letter of accommodation from Disability

Services early in the semester. For more information on accommodations, contact the Office of Disability Services at 704-687-0040 or visit their office at Fretwell 230.

Diversity

The Belk College of Business strives to create an inclusive academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity that includes, but is not limited to ability/disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.

Incomplete Grade Policy

Receiving a grade of incomplete (“I”) is not based solely on a student’s failure to complete work or as a means of raising his/her grade by doing additional work after the grade report time. An incomplete grade can be given only when a student has a serious medical problem or other extenuating circumstance that legitimately prevents completion of required work by the due date. In any case, for a student to receive an 'I' grade, the student's work to date should be passing, he/she must have completed a significant portion of the course, and the student must provide proper written proof (e.g., a doctor's note) of the extenuating circumstances.

Course Changes Policy

The instructor reserves the right to make any necessary changes to the course content, schedule, and policies. Changes will be announced in class and will also be posted online.

Religious Accommodation for Students Policy

The instructor will observe University Policy 409 (<https://legal.uncc.edu/policies/up-409>) on matters of religious accommodation. Please note that the procedure prescribed by this policy requires a notice to the instructor prior to the census date of the semester (typically the tenth day of instruction).

Tentative Class Schedule

*** This tentative schedule is subject to change ***

Week	Date	Topics	Due Dates
Week 1	Jan 14	<ul style="list-style-type: none"> • Course Introduction • Overview of Business Analytics • Brief Software Recap 	
Week 2	Jan 21	<ul style="list-style-type: none"> • Predictive Modeling 	Group formation due
Week 3	Jan 28	<ul style="list-style-type: none"> • Predictive Modeling 	Project topic due
Week 4	Feb 4	<ul style="list-style-type: none"> • Advanced Predictive Modeling 	Assignment 1 due
Week 5	Feb 11	<ul style="list-style-type: none"> • Advanced Predictive Modeling • Dimension Reduction 	
Week 6	Feb 18	<ul style="list-style-type: none"> • Experimentation in Data Science • Survival Analysis 	Assignment 2 Due
Week 7	Feb 25	<ul style="list-style-type: none"> • Midterm 	
Week 8	Mar 3	Spring break, no class. ☺	
Week 9	Mar 10	<ul style="list-style-type: none"> • Text Mining 	
Week 10	Mar 17	<ul style="list-style-type: none"> • Text Mining 	
Week 11	Mar 24	<ul style="list-style-type: none"> • Text Mining • Forecasting 	Assignment 3 due
Week 12	Mar 31	<ul style="list-style-type: none"> • Forecasting 	
Week 13	Apr 7	<ul style="list-style-type: none"> • Forecasting 	Project midterm report due
Week 14	Apr 14	<ul style="list-style-type: none"> • Group Project Day/Catch up 	Assignment 4 due
Week 15	Apr 21	<ul style="list-style-type: none"> • Social Network Analytics 	
Week 16	Apr 28	<ul style="list-style-type: none"> • Final Exam 	
Week 17	May 5	<ul style="list-style-type: none"> • Group Project Presentation 	