



**DSBA/MBAD 6211 Advanced Business Analytics
Course Syllabus Spring 2023**

Basic Information

Instructor: Xue Guo, Ph.D.

Office: 353C Friday

Phone: 704-687-7621

Email: xue.guo@uncc.edu

Classroom: Center City 901

Class Hours: Tuesday 5:30 pm – 8:15 pm

Website: Canvas will be the website for course information (<http://canvas.uncc.edu>).

TA: Saikerthan Reddy Depa (sdepa@uncc.edu)

Office Hours (Tentative): Tuesday 1:30 pm – 3:30 pm or by appointment; TA: Fridays 4:00 – 5:00 pm

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. This course uses a case approach and Python is the main analytical tool.

Specific topics covered in this course include

1. Predictive modeling (e.g., decision trees, neural network, SVM, random forest),
2. Model Evaluation,
3. Dimension reduction and feature selection,
4. Text analytics,
5. Time series analysis & forecasting,
6. Survival analyses,
7. Advanced clustering methods

We will have a case-based approach throughout the semester. The materials including power point presentations, cases, articles, and other readings will be uploaded to Canvas or shared in class by the instructor.

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 includes lectures, seminar style discussion, and lab work. This course will use statistical software Python for hands-on experimentation with various analytics techniques.

Course Materials

Handouts, power-point slides, assignments, and additional helpful resources will be posted on Canvas. Software: Python/Google Colab Notebooks

Recommended references:

- Google Colab Overview: https://colab.research.google.com/?utm_source=scs-index
- Free Python bootcamp course provided by the School of Data Science: [Introduction to Python For Data Science](#)

Grading

Component	Percentage
Two exams (2 @ 25%)	50%
Group project	25%
Assignments (4 @ 5%)	20%
Participation (5%)	5%
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 **open** book and notes. 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 11:59PM 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 4-5 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.

Class Policies

Attendance and Participation Policy

5% of the final grade is allocated to case reading discussions and class attendance. The students are required to read the case studies before the class and are highly encouraged to contribute to the case discussions in class. Other contributions to the class, including sharing personal experiences related to data science and business analytics, managerial insights, theoretical opinions, ... are all desirable as well. 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. Up to 2 missed sessions will be allowed upon instructor's approval in nonemergency cases.

Laptop Requirement

Students are required to have their own personal laptop computer. The policy and the minimum system requirements are found at the link <https://belkcollege.uncc.edu/laptop-policy>. In particular, students in DSBA/MBAD 6211 must have working webcam and microphone, and install R in their laptop.

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).

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COVID-19 Related Information

Niner Nation Cares

All students must follow the updates and instructions related to COVID-19 posted on <http://ninernationcares.charlotte.edu>. For your own health and safety and that of your friends and families, make sure to adhere to the health and safety guidelines posted on the above links. Please do not treat these guidelines lightly.

Belk College statement on diversity

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Title IX Reporting Expectations

UNC Charlotte is committed to providing an environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic violence, dating violence, and stalking. If you (or someone you know) has experienced or experiences any of these incidents, know that you are not alone. UNC Charlotte has staff members trained to support you in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, helping with civil protective orders, and more.

Please be aware that all UNC Charlotte employees, including faculty members, are expected to relay any information or reports of sexual misconduct they receive to the Title IX Coordinator. This means that if you tell me about a situation involving sexual harassment, sexual assault, dating violence, domestic violence, or stalking, I am expected to report the information to the Title IX Coordinator. Although I am expected to report the situation, you will still have options about how your case will be handled, including whether or not you wish to pursue a formal complaint. Our goal is to make sure you are aware of the range of options available to you and have access to the resources you need.

If you wish to speak to someone confidentially, you can contact the following on-campus resources, who are not required to report the incident to the Title IX Coordinator: (1) University Counseling Center (counselingcenter.uncc.edu, 7-0311); or (2) Student Health Center (studenthealth.uncc.edu, 7-7400). Additional information about your options is also available at titleix.uncc.edu under the “Students” tab.

All students are required to abide by the UNC Charlotte Sexual Harassment Policy and the policy on [Responsible Use of University Computing and Electronic Communication Resources](#). Sexual harassment, as defined in the UNC Charlotte Sexual Harassment Policy, is prohibited, even when carried out through computers or other electronic communications systems, including course-based chat rooms or message boards.

University's statement on 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 in Fretwell 230.

Tentative Class Schedule

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

Please bring your own laptop for all the sections			
Week	Date	Topics	Due
Week 1	Jan 10	<ul style="list-style-type: none"> • Course Introduction • Overview of Business Analytics • Brief Software Recap 	
Week 2	Jan 17	<ul style="list-style-type: none"> • Predictive Modeling—Logistic Regression and Model Evaluation 	Group formation due
Week 3	Jan 24	<ul style="list-style-type: none"> • Predictive Modeling—Trees and Neural Net 	
Week 4	Jan 31	<ul style="list-style-type: none"> • Predictive Modeling— Trees and Neural Net • Advanced Predictive Modeling—SVM and Ensemble methods 	Project topic due
Week 5	Feb 7	<ul style="list-style-type: none"> • Advanced Predictive Modeling—SVM and Ensemble methods 	Assignment 1 due
Week 6	Feb 14	<ul style="list-style-type: none"> • Dimension Reduction • Experimentation in Data Science 	Assignment 2 due
Week 7	Feb 21	Mid-Term Exam	
Week 8	Feb 28	Spring Break – No Class	
Week 9	Mar 7	<ul style="list-style-type: none"> • Phase 1 Project Presentation (Proposal) 	Phase 1 Group Project
Week 10	Mar 14	<ul style="list-style-type: none"> • Text Mining 	
Week 11	Mar 21	<ul style="list-style-type: none"> • Text Mining 	
Week 12	Mar 28	<ul style="list-style-type: none"> • Text Mining • Forecasting 	
Week 13	Apr 4	<ul style="list-style-type: none"> • Forecasting 	
Week 14	Apr 11	<ul style="list-style-type: none"> • Forecasting 	Assignment 3 due
Week 15	Apr 18	<ul style="list-style-type: none"> • Survival Analysis 	
Week 16	Apr 25	<ul style="list-style-type: none"> • Clustering Analysis 	Assignment 4 due
Week 17	May 2	Final Exam	
Week 18	TBD	<ul style="list-style-type: none"> • Phase 2 Project Presentation (Final Report) 	