Course Description: This course provides an introduction to the use of big data analytics as a strategic resource in creating competitive advantage for businesses. A focus is placed on integrating the knowledge of analytics tools with an understanding of how companies could leverage data analytics to gain strategic advantage. An emphasis is placed on developing the ability to think critically about complex problems/questions in real world data science and business analytics (DSBA) challenges. This course has a significant project-oriented component. Students will be divided in teams to analyze and provide insight on a real business dataset. Software tools such as Python will be introduced and will be used in completing the homework assignments and the data analysis of the group project.

Course Objectives: (1) Understand the role of big data analytics in organizational strategy and how organizations can leverage useful data/information to gain competitive advantage and acquire insights. (2) Gain an introductory knowledge of the data science and business analytics tools that are useful in extracting intelligence and value from data. (3) Apply big data analytics tools to analyze business opportunities and threats. (4) Use business cases/examples, develop data-driven strategies that enhance stakeholder relationships, open new market opportunities, and/or better position the organization for competitive advantage during industry transition. (5) Effectively communicate the findings from data analytics to a business audience.

Pre-requisite: Introduction to Python for Data Science

Required Textbook
Foster Provost and Tom Fawcett. Data Science for Business. What you need to know about data mining and data-analytic thinking. O'Reilly Media, 2013

Recommended Book – additional reading material will be provided in the class

Video Lectures/Lecture Notes/Assignments/Readings
Students will spend approximately 150 minutes of instructional time during the 15-week session using CANVAS and other web technologies. All video lectures, lecture notes, homework assignments and additional material will be available on CANVAS. You will be responsible for downloading them to prepare for class and complete assignments. Note that while this is a self-paced course you will have hard deadline for your assignments and assessments.
Student Work and Grading
1. (10%) Complete the prerequisite: Introduction to Python for Data Science
2. (15%) Mini-assignments (most modules have a mini-assignment)
3. (15%) Mini-quizzes (most modules have a mini-quiz with 1 or 2 questions)
4. (10%) Homework assignments (individual and group assignments)
5. (10%) Quizzes (5-6 questions)
6. (15%) Midterm exam (conceptual questions)
7. (15%) Group project presentations – peer evaluation
8. (10%) Participation based on peer feedback and class discussions

Grades
A (90-100%), B (80-90%), C (70-80%), D (60-70%), F (0-60%)

Tentative Schedule
Week 01 (Sep 7): Introduction
  (Sep 14): Last day to add, drop a course with no grade
Week 02 (Sep 14): Data Manipulation using Python
Week 03 (Sep 21): My First Model - Linear Regression; Overfitting & Regularization
Week 04 (Sep 28): Model Comparison; Cross-Validation & Hypothesis Testing
Week 05 (Oct 5): Data Wrangling
Week 06 (Oct 12): From Regression to Classification: Logistic Regression
Week 07 (Oct 19): Expected Value Framework for Business Problem Formulation
Week 08 (Oct 26): Visualizing Model Performance
Week 09 (Nov 2): Data Management & Working with Big Datasets
Week 10 (Nov 9): Nonlinear Models: Decision Trees & Ensemble Methods
Week 11 (Nov 16): Model Explainability & Fairness
Week 12 (Nov 23): Unsupervised Learning; Dimensionality Reduction; Clustering
Week 13 (Nov 30): Introduction to Neural Networks and Deep Learning
Week 14 (Dec 7): Automatic Machine Learning
Week 15 (Dec 14): Group Project Presentations

Team Policies and Expectations
If a team member refuses to cooperate on the project, his/her name should not be included on the completed work. If the non-cooperation continues, the team should meet with the instructor so that the problem can be resolved, if possible. If no resolution is achieved, the cooperating team members may notify the uncooperative member in writing that he/she is in danger of being fired, sending a copy of the memo to the instructor. If there is no subsequent improvement, they should notify the individual in writing (copy to the instructor) that he/she is no longer with the team. The fired student should meet with his/her instructor to discuss options. Similarly, students who are consistently doing all the work for their team may issue a warning memo that they will quit unless they start getting cooperation, and a second memo quitting the team if the cooperation is not forthcoming. Students who get fired or quit must find a team willing to accept them as member. As you will find out, group work isn’t always easy – team members sometimes cannot prepare or attend group sessions because of other responsibilities, and conflicts often result from differing skill levels and work ethics. When teams work and communicate well the benefits more than compensate for the difficulties. One way to improve the chances that a team will work well is to agree beforehand on what everyone on the team expects from everyone else.
**Academic Integrity**
Homework assignments are expected to be the sole effort of the student(s) submitting the work. Students are expected to follow the Code of Student Academic Responsibility. Every instance of a suspected violation will be reported. Students found guilty of violations of the Code will receive the grade of F for the course in addition to whatever disciplinary sanctions are applied. **Your source code submission will be checked against plagiarism.**

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.

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.

**Student Recordings are Prohibited**
Electronic video, image capture, and/or audio recording is not permitted during class, whether conducted in person or online, unless the student obtains permission from the instructor. If permission is granted, any distribution of the recording is prohibited. Students with specific electronic recording accommodations authorized by the Office of Disability Services do not require instructor permission; however, the instructor must be notified of any such accommodation prior to recording. Any distribution of such recordings is prohibited.

**Prevention of Sexual Harassment in Online Courses**
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.