

Big Data Analytics for Competitive Advantage

DSBA 6100-U01, MBAD 7090-U01

Spring 2019

Instructor: Dr. Gabriel Terejanu	Class Time: W 12:30PM-3:15PM
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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 Orange3/KNIME, Python and Tableau 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.

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

Some Recommended Books – additional reading material will be provided in the class

1. Thomas W. Miller. *Modeling Techniques in Predictive Analytics with Python and R. A Guide to Data Science.* Pearson Education, 2016
2. Jesus Rogel-Salazar. *Data Science and Analytics with Python.* Chapman and Hall/CRC, 2017

Lecture Notes/Assignments/Readings

Students will spend approximately 150 minutes of instructional time during the 15 week session using CANVAS or other web technologies, where 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.

Attendance Policy

Students are expected to attend all class meetings and to arrive before the class starts. Attendance will be taken at the beginning of each lecture. Class topics are integrated and hands-on activities are conducted in the majority of the classes. Failure to attend or to arrive on time can adversely affect both individual performance and the ability to contribute to the group project. *If a student misses 4 weeks of class or more, they will automatically receive an unsatisfactory U grade in the course regardless of earned points to date on other activities.* If a student misses a class due to work or other reasons, it is their responsibility to get notes from peers; the instructor does not hold extra repeat class sessions.

Student Work and Grading

1. (20%) Homework assignments (~ 4 assignments)
2. (10%) Announced quizzes (~ 4 quizzes)
3. (20%) Midterm exam
4. (20%) Final exam
5. (20%) Group project presentations – peer evaluation
6. (10%) Attendance and participation based on peer feedback

Grades

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

Tentative Schedule

Week 1 (Jan 9):

1. Introduction & Software.
2. Application: Advertising and Promotion

Week 2 (Jan 16 - **Last day to add, drop a course with no grade**):

1. Supervised Learning (Regression); Linear Regression; Overfitting; Regularization; Performance evaluation
2. Application: Demand Forecasting

Week 3 (Jan 23):

1. Data Wrangling and Management
2. **LendingTree – guest lecture**

Week 4 (Jan 30):

1. Supervised Learning (Classification); Logistic Regression; Performance evaluation
2. Application: Bank Marketing

Week 5 (Feb 6):

1. Model Complexity & Model Selection
2. Decision Trees & Combining Models

Week 6 (Feb 13):

1. Unsupervised Learning; Clustering. Application: Customer Segmentation
2. Data Reduction (feature extraction)

Week 7 (Feb 20):

1. Hypothesis Testing – The Scientific Method
2. **LendingTree proposal discussions**

Week 8 (Feb 27):

3. **Midterm Exam**
4. Best Practices in Data Visualization

Week 9 (Mar 13):

1. Recommender Systems
2. Application: Market Basket Analysis

Week 10 (Mar 20):

1. Time Series Analysis
2. Application: Economic Data Analysis

Week 11 (Mar 27):

1. Text Analytics
2. Application: Sentiment & Stock Price Prediction

Week 12 (Apr 3):

1. Neural Networks and Deep Neural Networks
2. Image Analytics Application

Week 13 (Apr 10):

1. Explainable Models.
2. Adversary Approaches.

Week 14 (Apr 17):

1. Regulations and Privacy.
2. Data Anonymization.

Week 15 (Apr 24):

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.