DSBA 6100-U91 - Big Data Analytics for Competitive Advantage
(Cross listed as MBAD7090-U91)

Fall 2020

Class meetings:
Sep 9th – Sep 30th: **Online** (join via Zoom link posted on Canvas for that day’s class)
Oct 7th – End of Semester: Wednesdays 6.30pm-9.15pm **201 Center City Building (2nd floor)**.

**Instructor:** Dr. Chandra Subramaniam, Belk College of Business & School of Data Science
**Office:** 353-A Friday
**Email:** csubrama@uncc.edu
**Web:** [https://belkcollegeofbusiness.uncc.edu/csubrama/](https://belkcollegeofbusiness.uncc.edu/csubrama/)
**Office hours:** Wednesdays 5.00-6.00pm; By prior appt at other times.

**TA:** Juan Ricardo (jricardo@uncc.edu)

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**Important Information & Policies for Fall 2020 semester**

**Niner Nation Cares:** All students must follow the updates and instructions related to Fall semester reopening posted on [http://ninernationcares.uncc.edu](http://ninernationcares.uncc.edu) and [https://ninernationcares.uncc.edu/students](https://ninernationcares.uncc.edu/students). 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.

**Face coverings in classrooms and labs:** It is the policy of UNC Charlotte for the Fall 2020 semester that as a condition of on-campus enrollment, all students are required to engage in safe behaviors to avoid the spread of COVID-19 in the 49er community. Such behaviors specifically include the requirement that all students properly wear **CDC-compliant face coverings** while in buildings including in classrooms and labs. Students are permitted to remove face coverings in classroom or lab settings only when I explicitly grant permission to do so (such as while asking a question, participating in class discussion, or giving a presentation) and while at an appropriate physical distance from others. Failure to comply with this policy in the classroom or lab may result in dismissal from the current class session. If the student refuses to leave the classroom or lab after being dismissed, the student may be referred to the Office of Student Conduct and Academic Integrity for charges under the [Code of Student Responsibility](http://www.uncc.edu/studentconduct).  

**Absenteeism during Covid-19:** Students are expected to attend every class and remain in class for the duration of the session when it is safe to do so in accordance with university guidance regarding COVID-19. Failure to attend class or arriving late may impact your ability to achieve course objectives which could affect your course grade. An absence, excused or unexcused, does not relieve a student of any course requirement. Regular class attendance is a student’s

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1 This syllabus may be subject to minor changes during the semester after adequate advance notice to students.
obligation, as is a responsibility for all the work of class meetings, including tests and written tasks. Any unexcused absence or excessive tardiness may result in a loss of participation points. For absences related to COVID-19, please adhere to the following:

- **Do not come to class if you are sick.** Please protect your health and the health of others by staying home. Contact your healthcare provider if you believe you are ill.
- **If you are sick:** If you test positive or are evaluated by a healthcare provider for symptoms of COVID-19, complete this form to alert the University. Representatives from Emergency Management and/or the Student Health Center will follow up with you as necessary, and your instructors will be notified.
- **If you have been exposed** to COVID-19 positive individuals and/or have been notified to self-quarantine due to exposure, complete this form to alert the University. Representatives from Emergency Management and/or the Student Health Center will follow up with you as necessary, and your instructors will be notified.

To return to class after being absent due to a COVID-19 diagnosis or due to a period of self-quarantine, students should submit an online request form to Student Assistance and Support Services (SASS). Supporting documentation can be attached directly to the request form and should be from a student's health care provider or the Student Health Center, clearly indicating the dates of absences and the date the student is able to return to class. Instructors will be notified of such absences.

If you are absent from class as a result of a COVID-19 diagnosis or quarantine, please notify your instructor immediately and seek instructions to help you continue to make progress in the course. The specific instructions for this situation will be provided on a case-by-case basis. The final decision for approval of all absences and missed work is determined by the instructor.

**Remote sessions:** The classes from September 7 until October 1 will be held online. You must join the class online via the zoom links posted on Canvas for the classes during the above period.

**Laptop requirement:** All DSBA students are required to have their own laptop computer. In addition, due to some classes being remote & online, your laptop must have a working webcam and a microphone. Please make sure that your laptop can access the webpages and other materials posted on Canvas and that there are no network access restrictions installed by your workplace. If so, you may find having your personal laptop saves a lot of issues relating to doing work in class.

**Student Support:** The details of student support resources available are provided at the following links.

- **Academic support:** [https://ninernationcares.uncc.edu/students/academic-support](https://ninernationcares.uncc.edu/students/academic-support).
- **Health support:** [https://ninernationcares.uncc.edu/health-support-services](https://ninernationcares.uncc.edu/health-support-services)
Syllabus and Class Expectations

Course Description
This course provides an overview of the use of big data analytics as a strategic resource in creating competitive advantage for businesses. The focus is on integrating the knowledge of analytics tools with an understanding of how companies could leverage big data analytics to gain strategic advantage. You will learn to think critically about complex business problems/questions in the real world and understand how data science and business analytics (DSBA) can be used to solve those problems/questions.

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.

This class is not about learning or mastering Hadoop or Python programming or deriving data mining formulas. As such, you will not be taught any programming language or Hadoop coding in this class. Rather, the focus is on an awareness of the tools and techniques in big data analytics and how they can be leveraged to address business opportunities and problems. Tools such as R, SAS Enterprise Guide and Tableau will be covered at a level appropriate for doing data wrangling, visualization, and modeling. More importantly, this course is designed to emphasize critical thinking and business problem-solving with big data.

Pre-requisite Knowledge in Statistics & Probability
All students in my class are required to have basic proficiency in Statistics and Probability before we begin our discussion of predictive models, which usually happens around the middle of October. If you are a new DSBA student joining this semester, you must have received information that you are required to complete 3 bootcamps, one each in Statistics, Python and R. For my class, I want you to complete the "Training - Statistics for Data Science" and complete it before October 16th. If you are in the MBA program or a returning DSBA/HIA student and did not receive the bootcamp information, please register for the bootcamp by filling out the google form linked below (and select "Overview of Statistics for Data Science" as the training option.

https://docs.google.com/forms/d/e/1FAIpQLSfr_LAeo_D2CYOfBqeAnTXquOokodfL1ilm_7noh4u6tU3KQ/viewform?usp=pp_url

You will be registered and can proceed to complete the course. You must complete the course by October 16th. I will ask for the completion certificate from all my students on Oct 19th.
Instructional Method
This course will take a business use-case & problem-solving approach, complemented by lectures, seminar style discussions and outside speakers. Students will be introduced to several analytics topics and tools through business use-cases and problems. Students should bring laptops with them to class for hands-on exercises.

Credit Hours
This is a 3 credit hour course. Thus, the course has been designed to require on average about 10 hours/week (about 3 hours outside of class for every 1 credit hour) between readings, quizzes, and exercise/project work. Of course, the hours may be more or less than indicated above depending on the assignments, cases, exams or project work due. If a student has limited backgrounds in certain topics, they might need to spend additional time to keep up with other students in the course.

Reading Materials
Required Readings (NO PURCHASE REQUIRED): Required readings may include chapters, online articles and analytics use-cases. These resources are free and will be posted or hyperlinked on the class Canvas page well in advance of the relevant class period.

Software: This class will use software such as Tableau, R, and SAS Enterprise Guide. The instructor will provide instructions to access the software for free.

Office hours: In Fall semester, office hours and one-on-one meetings will be held online via zoom. During the scheduled open office hours, appropriate zoom link will be posted on Canvas. Click the link to enter the virtual office, and your instructor will allow you in in the order of the students who have entered. If you like to set up an appointment outside of the scheduled office hours, email your instructor giving your availability and the instructor will setup a zoom link for you to join at the agreed meeting time.

Grading
The final grade will be determined on the following weights:

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<thead>
<tr>
<th>Component</th>
<th>Individual or Group</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Exams (2 x 250 points)</td>
<td>Individual</td>
<td>500 points (50%)</td>
</tr>
<tr>
<td>Homework Exercises</td>
<td>Individual</td>
<td>200 points (20%)</td>
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<tr>
<td>In-class assignments and quizzes</td>
<td>Individual</td>
<td>150 points (15%)</td>
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<tr>
<td>Group Project &amp; Presentation</td>
<td>Group</td>
<td>150 points (15%)</td>
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2 Any changes to the grading components or weights will be at the discretion of the instructor and will be communicated to the students well in advance.
Final letter grades will be based on the following total points at the end of semester:

- 900 and above  A (Superior Performance)
- 800-899.99    B (Good Performance)
- 650-799.99    C (Average Performance)
- Below 650     U (Unsatisfactory)

Group Projects Overview (details will be explained in class)
Each group will be required to complete a project in two phases. The first phase will focus on data cleaning, preparation and visualization. The second phase will focus on articulating how big data and analytics can be used to address business problems/opportunities, developing analytics models and presenting the findings and recommendations. The groups will apply their learning from this class and their own research to come up with data driven solutions and present them in competitive strategy terms. Each group is expected to submit a mid-term report and a final report. In addition, each group will present their project towards the end of the semester.

Attendance
Students are expected to join/attend all class meetings and to join/arrive before the class starts. Class topics are integrated, with each week building on prior weeks. Failure to join/attend or to arrive on time can adversely affect both individual performance, ability to contribute to the group project, and the earned letter grade. If a student misses 4 or more classes, 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; instructors do not hold extra repeat class sessions. Also, there will be no make-up quizzes or in-class assignments given irrespective of whether your absence is excused or un-excused.

Quizzes & In-class Assignments
There will be short quizzes at various points in the semester on topics covered before. There may also be in-class assignments. Once an exam/quiz has started and work has been collected, late arrivals cannot make them up. (If one arrives during a quiz, they can immediately start on it, but no time extension will be given). Make-up quizzes or in-class assignments are not allowed irrespective of whether your absence is excused or un-excused. Instead, one quiz out of all administered quizzes will be dropped for the final grading. Since the class meets on Wednesdays evening, please arrange your work or personal activities around this schedule.

Extra Credit Opportunities
Descriptions of extra credit opportunities, if any, will be offered to the entire class and posted to class page on Canvas. However, it is strongly encouraged that students do not rely on extra credit to improve their grades as we may end up with very few or no extra credit opportunities in the semester. No extra credit opportunities will be offered after Dec 3rd 2020. Most importantly, no extra credit will be offered to an individual student for the purpose of improving her/his grades. Bottom line: Stay focused throughout the semester and do not miss any assignment or test, so you don’t have to rely on extra credit for improving your grades.
Team Work for Project
The final project is a team activity. The instructor will form the teams within the first 3 weeks of the class. Once the teams are formed, the team members are responsible for organizing themselves, dividing up the work, and deciding how relative contributions should be measured. It is also the team’s responsibility to promptly inform the instructor of any dysfunctional team dynamics and to solicit his help.

It is the responsibility of the team to ensure that all team members understand all concepts related to the completed projects and presentations. The instructor may ask questions about any completed project or presentation to any team member and any incomplete or unsatisfactory answers will affect the team grade. The instructor will later announce additional measures to obtain feedback on group member contributions and institute appropriate grade penalty for lack of participation. However, this grade penalty will be limited to the course-work that are group-based.

Civility
The University strives to create an inclusive academic climate in which the dignity of all individuals is respected and maintained. We celebrate diversity that is beneficial to both employers and society at large. Students are strongly encouraged to be respectful and courteous towards others when sharing their views during class discussions.

Academic Integrity/Honesty
Students have the responsibility to know and observe the requirements of The UNC Charlotte Code of Student Academic Integrity available online at http://legal.uncc.edu/policies/up-407. This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism (which includes viewing others work without instructor permission), abuse of academic materials, and complicity in academic dishonesty. This forbidding includes sharing/copying work between individuals or teams without permission of instructors. Any special requirements or permission regarding academic integrity in this course will be stated by the instructor, and are binding on the students. Students who violate the code can be expelled from UNC Charlotte. The normal penalty for a first offense 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 failing. Students are expected to report cases of academic dishonesty to the course instructor.

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.

Accommodations for Religious Observances
UNC Charlotte provides reasonable accommodations, including a minimum of two excused absences each academic year, for religious observances required by a student’s religious
practice or belief. Please refer to https://legal.uncc.edu/policies/up-409 for details on requesting such accommodations.

Other Information

χ Students are responsible for all announcements made in class or announced via email. The instructors may send some information via Canvas announcements. It is the students’ responsibility to keep up-to-date on the class-related information and to check their @uncc.edu email regularly.

χ The instructors will discuss grades only in person (and not via telephone or e-mail) and only with the student (not with parents, spouses, etc). The instructors may not answer student e-mails other than related to scheduling appointments. Office hours are posted in the syllabus on page 1.

χ The instructors may modify the class schedule and syllabus during the course of the semester depending upon the progress of the class.

The University of North Carolina Charlotte and the Belk College of Business strive 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.

Topics and Tentative Schedule (as of 8/28/2020)

Note: This schedule is subject to change during the semester. Always refer to the latest class schedule and announcements posted on Canvas.

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<thead>
<tr>
<th>Date</th>
<th>Theme/Topic of Discussion</th>
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<tbody>
<tr>
<td></td>
<td><em>(The info about each week’s reading materials are posted on Canvas )</em></td>
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<td><em>(Sessions 9-Sep thru 30-Sep are online; Zoom links are posted on Canvas)</em></td>
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<tr>
<td>9-Sep</td>
<td>Class overview, Syllabus, Software</td>
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<td>Introduction to Big Data Analytics</td>
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<td>16-Sep</td>
<td>Big Data use cases in Business: Drivers and Challenges</td>
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<td><strong>Main Article:</strong> Big Data in Big Companies</td>
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<td><strong>Supplementary Article:</strong> Pirelli Tires becomes Data Driven</td>
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<td>23-Sep</td>
<td>Data Sourcing and Management: The Acquisition, Collection, Storage and Analysis of Big Data</td>
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<td>30-Sep</td>
<td>Data Wrangling: Cleaning, Transforming, and Preparing Data for Analytics</td>
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<td>Data Visualization and Exploration</td>
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<td><em>(Sessions from Oct 7 thru end of semester meet in room 201 Center City Building)</em></td>
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<tr>
<td>7-Oct</td>
<td>Data Visualization and Exploration, including hands-on</td>
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<td>14-Oct</td>
<td>Data Visualization and Exploration, including hands-on</td>
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<td>21-Oct</td>
<td>Exam 1</td>
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<td>28-Oct</td>
<td>Supervised Learning Models</td>
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<td>4-Nov</td>
<td>Supervised Learning Models</td>
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<td><em>[Group Project mid-term report due]</em></td>
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<td>11-Nov</td>
<td>Unsupervised Learning Models</td>
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<td>18-Nov</td>
<td>Advanced Learning Models</td>
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<td>Overview of Text Analytics</td>
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<td>27-Nov</td>
<td>Thanksgiving Break – No Class</td>
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<td>2-Dec</td>
<td>Big Data Ethics &amp; Privacy Issues</td>
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<td>9-Dec</td>
<td>Final Exam</td>
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<tr>
<td>TBD</td>
<td>Group Project – Final Presentations</td>
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