DSBA6100         Spring 2015

Big Data Analytics
For Competitive Advantage
Cross listed as MBAD7090, ITCS 6100, and HCIP 6103

Dr. Jared Hansen, Associate Professor of Marketing
Dr. Wlodek Zadrozny, Associate Professor of Computer Science
DSBA6100 - Big Data Analytics for Competitive Advantage  
(Cross listed as MBAD7090, ITCS 6100, HCIP 6103)  

DSBA6100 Section U91 @ Wed 12:00-2:45pm in Room 902 CCB  
DSBA6100 Section U92 @ Wed 5:30-8:15pm in Room 902 CCB  
As created and co-taught by Dr. Jared Hansen and Dr. Wlodek Zadrozny, ©2015-2025  

Dr. Jared Hansen, Department of Marketing, Belk College of Business,  
Office: 250B Friday, Email: jared<Hansen@uncc.edu>Web: [http://belkcollegeofbusiness.uncc.edu/jaredhansen](http://belkcollegeofbusiness.uncc.edu/jaredhansen)  
Spring 2015 office hours: posted online  

Dr. Wlodek W Zadrozny, Department of Computer Science, College of Computing and Informatics,  
Office: 435D Woodward, Email: wzadrozn<at>uncc.eduWeb: [https://cci.uncc.edu/directory/zadrozny-wlodek](https://cci.uncc.edu/directory/zadrozny-wlodek)  
Spring 2015 office hours: posted online  

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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.  

**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 reveal business opportunities and threats.  
4. Using actual 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.  

**Instructional Method**  
This course will take a case & project approach, complemented by lectures, seminar style discussion and outside speakers. Students will be introduced to several topics and tools with emphasis through cases and projects on how to use them to generate firm value. Students should bring laptops with them to class for hands-on exercises.  

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1 The focus of the class is not on mastering hadoop code or deriving formulas. Rather, the focus is on knowing which combinations of data/metadata, algorithms, tools, and softwares should be used to address different types of major business problems and how to think critically about designing data strategies for complex problems/questions.
Credit Hours: This is a 3 credit hour course. Thus, the course has been designed to require about 10 hours/week (about 3 hours outside of class for every 1 credit hour) between readings, quizzes, and exercise/project work. If a student has limited backgrounds in certain topical areas, they might need to spend additional time to keep up with other students in the course.

Required Readings:
There will be several business cases (PDFs or hyperlinked) and a series of topical article posted to the class moodle page.

Supplemental (Not Required) Readings (for those who want additional technical information):

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

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercises and Cases</td>
<td>250</td>
<td>25%</td>
</tr>
<tr>
<td>Start of Class Quizzes/Activities</td>
<td>50</td>
<td>5%</td>
</tr>
<tr>
<td>Post Class Online Review Quizzes</td>
<td>50</td>
<td>5%</td>
</tr>
<tr>
<td>Final Group Term Project Part 1</td>
<td>250</td>
<td>25%</td>
</tr>
<tr>
<td>Final Group Term Project Part 2</td>
<td>250</td>
<td>25%</td>
</tr>
<tr>
<td>Final Group Term Project Part 3</td>
<td>150</td>
<td>15%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1000</strong></td>
<td><strong>100%</strong></td>
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</tbody>
</table>

Final letter grades will be based on the following totals:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Points</th>
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<tbody>
<tr>
<td>A (Superior Performance)</td>
<td>900 and above</td>
</tr>
<tr>
<td>B (Good Performance)</td>
<td>750-899</td>
</tr>
<tr>
<td>C (Average Performance)</td>
<td>600-749</td>
</tr>
<tr>
<td>U (Unsatisfactory)</td>
<td>Below 600</td>
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Attendance
Students are expected to attend all class meetings and to arrive before the class starts. Class topics are integrated, with each week building on prior weeks. Failure to 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 3 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; instructors do not hold extra repeat class sessions.

**Start of Class Quizzes & Participation**
There will normally be short (usually up to 10 question) quizzes that occur at the beginning of class that ask questions about the assigned readings for that class period. If there are no readings or under other circumstances, there might be a short activity instead. Once grading has started or 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 made). Quizzes are graded using the quiz rubric shared in class during the first grade.

To reward meaningful participation, individuals who make insightful questions or comments during the class will receive a ‘golden ticket’ which they turn into the TA at the end of class. Golden ticket points are bonus points that offset missed quiz questions per the quiz rubric.

**Online Post Class Review Quizzes**
Scholarship on pedagogy has indicated that repetition helps develop mastery. There will be online review quizzes after each class session (similar to the start of class quizzes). They will be in Moodle or another online location indicated in-class by the instructor.

**Exercises and Cases**
There will normally be weekly cases and exercises that help participants practice read/discussed topics. Some cases and exercises will involve the entire class discussing a situation while others will be team-based discussion/answers. The teams for the exercises and cases will be randomly assigned by the instructors at the end of the second week of class. The group assignments will be listed in an Excel file posted to Moodle. Most cases/exercises will be posted on the class web page. Sometimes the web page may refer students to the class Moodle page or it may be emailed to the students. Exercises and cases will always be posted and/or announced at least one week in advance of the due date.

**Final Group Term Project**
The final group term project (parts 1, 2, and 3) is described in detail in a separate document posted online and discussed during the first week of class.

**Extra Credit Opportunities**
Descriptions of extra credit opportunities will be discussed in-class and posted to the online class resources/moodle.

**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 actively appropriately share their views in 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.

Inclement Weather
University Policy Statement #13 states the University is open unless the Chancellor announces that the University is closed. The inclement weather hotline number to call is 704-786-2877. **In the event of inclement weather, check your email the morning of class.** The instructors will use their best judgment as to whether class should be held understanding that some of you commute from far away and the instructors will notify you by email if class is cancelled.

Other Information
χ Students are responsible for all announcements made in class and on the class online resources. Students should check the online class resources throughout the semester. The instructors will send occasional emails with important information to the class listing in the Banner system. It is the students’ responsibility to make sure that their email addresses are accurate.

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); student e-mails other than related to scheduling appointments may not be answered by the instructors. Office hours for each week will be posted online each week.

χ Emails to instructors regarding the class or appointments need to include both instructors on emails (and the responding instructor will reply all) or they should see either of the instructors in person in their office by appointment.

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

χ By attending class beyond the first week, students agree to follow the framework and rules related to this course that are described above.
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<thead>
<tr>
<th>Date</th>
<th>Instructor</th>
<th>Tentative Topic</th>
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| 7-Jan  | Hansen and Zadrozny   | # Overview of Course, Group Project, Program/Classes, Field/Jobs  
# Defining/Understanding Data Science, Big Data, Analytics  
# Introduction to Search/Mungling |
| 14-Jan | Hansen + guest        | # DSBA Ethical Questions 101: data gathering, analysis, conflicts  
# Defining/Understanding Competitive Advantage + Organizational Strategy |
| 21-Jan | Zadrozny              | # Data Wrangling/Munging 101: Classification Tools  
# DSBA Ethical Questions 102: A.I., data mining predictions |
| 28-Jan | Hansen                | # Data Wrangling/Munging 102: Statistical Thinking/Considerations in Big Data  
# Exploratory Big Data Analysis Considerations |
| 4-Feb  | Zadrozny              | # Data Wrangling/Munging 201: Mining Frequent Data/Items Sets + Graph Analysis |
| 11-Feb | Hansen                | # Data Visualization 101: Preattentive Visual Processing, Design Best Practices, & Data Storytelling Strategy  
# Visualization in Excel and Tableau |
| 18-Feb | Hansen                | # Data Visualization 102: Dashboard Strategies, Data Storytelling to Technical vs. Nontechnical Audiences  
# Visualization in SPSS/SAS and R |
| 25-Feb | Hansen                | # Data Wrangling/Munging 301: Data Machine Learning Algorithms |
| 4-Mar  | --                    | University Spring Break |
| 11-Mar | Zadrozny              | **Group Project Presentations – Part 1: Data Collection Summary** |
| 18-Mar | Zadrozny + guest speaker | # Big Data Analytics: Unstructured Text Mining + Sentiment  
# Big Data Analytics: Big Iron for Big Data…Hadoop Managerie  
# DSBA Strategy: Competing on Analytics w/ External Processes |
| 25-Mar | Hansen                | # Big Data Analytics: Choosing Among Regression Models (OLS, 2SLS, Logistic/Binary, Jackknife, Ridge, Stepwise, Curvilinear, etc.)  
# DSBA Strategy: RoadMap to Enhanced Analytical Capabilities |
| 1-Apr  | Zadrozny              | # Big Data Analytics: Graphical Modeling & Analytics + Logistic Regression/Bayes  
# DSBA Strategy: Managing Analytical People |
| 8-Apr  | Hansen                | # Big Data Analytics: Bayesian Regression/Prediction  
# Big Data Analytics: Market Segmentation/Classification of Big Data  
# Big Data Analytics: Visualization of Sentiment + Graphical Analysis  
# DSBA Strategy: Architecture of Business Intelligence |
# DSBA Strategy: Future of Analytical Competition |
| 22-Apr | Hansen                | **Group Project Presentations – Part 2: Business Analytics Summary** |
| 29-Apr | --                    | University Reading Day |
| 6-May  | Hansen & Zadrozny     | **Group Project Presentations – Part 3: Meta-Analysis of All Teams** Data/Findings |