ISM 6930, Section 522, 3 Credit Hours
Special Topics in MIS: Business Analytics and Big Data
Spring 2015, Room A-205

Instructor: Dr. Anurag Agarwal
E-Mail: agarwala@usf.edu
Class Time: Saturday, 3:00 to 6:00 p.m.

Office: SMC-C217
Office Telephone: 941-359-4522
Office Hours: By appointment

PREREQUISITES: QMB-6305, ISM-6021

COURSE DESCRIPTION: This course provides an overview of the various aspects of Business Analytics in general and Big Data Analytics in particular. The course covers topics in descriptive, predictive and prescriptive analytics. Big Data technologies and tools are also covered.

COURSE TOPICS:
1. Descriptive Analytics
   a. Pivot Tables/Charts
   b. Visualization
2. Predictive Analytics
   a. Classification Models (Neural Networks, Decision Trees)
   b. Clustering Models (K-Means, Agglomerative, Dendrograms)
   c. Association Rule Mining
   d. Text Mining
   e. Statistical Models
3. Prescriptive Analytics
   a. Basic Optimization models
4. Business Applications
   a. Translating a Business Problem as an Analytics Problem
   b. Translating Analytics Solution to Business Solution
   c. Social Media Analytics, Web Analytics
   d. Retail Analytics, Sports Analytics
   e. Recommender Systems
   f. Sentiment Analysis
5. Big Data Related Topics
   a. Hadoop (1 and 2) and MapReduce
   b. NoSQL Databases
   c. Cloud Computing
6. Tools
   a. R, Rattle
   b. RapidMiner
   c. Tableau

COURSE OBJECTIVES: To understand the principles of big data management and big data analytics and their applications in business.

COURSE STUDENT LEARNING OUTCOMES: At the conclusion of the course the student should be able to:
1. Appreciate the value of big data analytics as a competitive tool for businesses.
2. Distinguish between descriptive, predictive and prescriptive analytics.
3. Learn about data mining tasks such as classification, clustering and association rules.
4. Learn about big data technologies such as Hadoop, MapReduce and NoSQL databases.
5. Learn tools like R, Rattle, Tableau and Rapid MIner for analytics.
6. Learn about the Analytics life cycle.

**TEXT AND MATERIALS:** There is no required textbook for this course. But there are some readings and notes.

**List of Readings:**


The pdf files of the above articles will be posted on the class web site on Canvas. In addition to these articles, some more notes and ppt files will also be posted.

**CANVAS USE:** The class syllabus is posted in Canvas, an online course management system. In this class Canvas will be used for posting course content and conducting online quizzes and exams. [http://www.usfsm.edu/infocommons/students.php](http://www.usfsm.edu/infocommons/students.php)

**COMPUTER LAPTOP USE:** USFSM requires all students to have laptops that can be brought with them to class. You are expected to bring your laptop to class so you can follow in class hands-on examples.

**PLAGIARISM SOFTWARE:** The University of South Florida has an account with an automated plagiarism detection service which allows student assignments be checked for plagiarism. I reserve the right to ask students to submit their assignments to Turnitin through Canvas. Assignments are compared automatically with a database of journal articles, web articles, and previously submitted papers. The instructor receives a report showing exactly how a student’s paper was plagiarized.

**PLEASE REMOVE YOUR NAME FROM THE BODY OF YOUR PAPER AND REPLACE IT WITH YOUR USF ID#. ALSO REMOVE YOUR NAME FROM THE FILE NAME AND REPLACE IT WITH YOUR USF ID# (e.g., “U12345678 Essay 1.docx”) BEFORE SUBMITTING IT TO TURNITIN.**

Pursuant to the provisions of the Family Educational Rights and Privacy Act (FERPA), students are requested to maintain confidentiality as a way to keep their personal
contact information (i.e. name, address, telephone) from being disclosed to vendors or other outside agencies. By your submission, you are also agreeing to release your original work for review for academic purposes to Turnitin.

**GRADING, EVALUATION AND ATTENDANCE POLICIES:**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
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<tbody>
<tr>
<td>Article Summary Presentation and Discussion (Group)</td>
<td>20 pts</td>
</tr>
<tr>
<td>Consulting Project Presentation (Group)</td>
<td>40 pts</td>
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<tr>
<td>Assignments (Seven)</td>
<td>70 pts</td>
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<tr>
<td>Quizzes (Five)</td>
<td>50 pts</td>
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<tr>
<td>Midterm</td>
<td>20 pts</td>
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<tr>
<td>Final</td>
<td>40 pts</td>
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<tr>
<td>Attitude, Behavior, Class participation</td>
<td>20 pts</td>
</tr>
<tr>
<td><strong>Total Course Points</strong></td>
<td><strong>260 pts</strong></td>
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Grade cutoffs will be as follows:
- 97.0% for an A+, 93% for an A, 90.0% for an A-
- 87.0% for a B+, 83.0% for a B, 80.0% for a B-
- 77.0% for a C+, 73.0% for C, 70.0% for C-
- 67.0% for a D+, 63.0% for a D, 60.0% for a D-
- Below 60.0% results in an F grade

Note: At the graduate level, a grade of C- is essentially a failing grade because you will be required to repeat the course if you earn a grade of C- or below.

**Article Summary Presentation and Discussion:**
The class will be divided into groups of 3 students. Each group will present a ten-minute summary of one of the articles chosen from the list of readings above. Everyone will read the articles and be ready for discussion. These presentations will be scattered throughout the semester.

**Consulting Project Presentation:**
The class will be divided into groups of 3 students. Each group will work on a consulting project. The project will be assigned during the second class meeting. The group will act like a consultant for a company to address a business problem and will present an Analytics solution to the problem. The presentations will be on the last day of classes.

**Assignments:**
Eight assignments will be assigned, each worth 10 points. Specific problems will be assigned that students will solve using the tools and techniques learned during the course. Assignments submitted late will be penalized 20% of the grade for being up to 24 hours late and 40% of the grade for being 24 to 48 hours late. Beyond 48 hours, the assignment will not be graded for credit.
Quizzes:
Five quizzes will be conducted during the semester.

Exams: There will be a midterm and a final exam.

Attitude, Behavior and Class Participation:
Twenty points are reserved for attitude, behavior and class participation. You are expected to attend every class, be in class on time, pay attention to and engage in class activities, show an attitude of learning, not disrupt class, show respect for others and in general exhibit a positive attitude.

USFSM AND USF SYSTEM POLICIES

A. Academic Dishonesty: The University considers any form of plagiarism or cheating on exams, projects, or papers to be unacceptable behavior. Please be sure to review the university’s policy in the catalog, USFSM Undergraduate Catalog or USFSM Graduate Catalog, the USF System Academic Integrity of Students, and the USF System Student Code of Conduct.

B. Academic Disruption: The University does not tolerate behavior that disrupts the learning process. The policy for addressing academic disruption is included with Academic Dishonesty in the catalog: USFSM Undergraduate Catalog or USFSM Graduate Catalog, USF System Academic Integrity of Students, and the USF System Student Code of Conduct.

C. Contingency Plans: In the event of an emergency, it may be necessary for USFSM to suspend normal operations. During this time, USFSM may opt to continue delivery of instruction through methods that include but are not limited to: Canvas, Elluminate, Skype, and email messaging and/or an alternate schedule. It’s the responsibility of the student to monitor Canvas site for each class for course specific communication, and the main USFSM and College websites, emails, and MoBull messages for important general information. The USF hotline at 1 (800) 992-4231 is updated with pre-recorded information during an emergency. See the Safety Preparedness Website for further information.

D. Disabilities Accommodation: Students are responsible for registering with the Office of Students with Disabilities Services (SDS) in order to receive academic accommodations. Reasonable notice must be given to the SDS office (typically 5 working days) for accommodations to be arranged. It is the responsibility of the student to provide each instructor with a copy of the official Memo of Accommodation. Contact Information: Disability Coordinator, 941-359-4714, disabilityservices@sar.usf.edu, http://www.usfsm.edu/students/disability/

E. Fire Alarm Instructions: At the beginning of each semester please note the emergency exit maps posted in each classroom. These signs are marked with the
primary evacuation route (red) and secondary evacuation route (orange) in case the building needs to be evacuated. See Emergency Evacuation Procedures.

F. Religious Observances: USFSM recognizes the right of students and faculty to observe major religious holidays. Students who anticipate the necessity of being absent from class for a major religious observance must provide notice of the date(s) to the instructor, in writing, by the second week of classes. Instructors canceling class for a religious observance should have this stated in the syllabus with an appropriate alternative assignment.

G. Sexual Misconduct/Sexual Harassment Reporting: USFSM is committed to providing an environment free from sex discrimination, including sexual harassment and sexual violence (USF System Policy 0-004). The Counseling and Wellness Center is a confidential resource where you can talk about incidents of sexual harassment and gender-based crimes including sexual assault, stalking, and domestic/relationship violence. This confidential resource can help you without having to report your situation to either the Office of Student Rights and Responsibilities (OSSR) or the Office of Diversity, Inclusion, and Equal Opportunity (DIEO), unless you request that they make a report.

Please be aware that in compliance with Title IX and under the USF System Policy, educators must report incidents of sexual harassment and gender-based crimes including sexual assault, stalking, and domestic/relationship violence. If you disclose any of these situations in class, in papers, or to me personally, I am required to report it to OSSR or DIEO for investigation. The Deputy Coordinator for USFSM is Mary Beth Wallace, AVP for Student Enrollment, Engagement and Success, 941-359-4330 or marybeth@sar.usf.edu.

Campus Resources:
- Counseling Center and Wellness Center 941-487-4254
- Victim Advocate (24/7) 941-504-8599

List of off-campus resources:
- Hope of Manatee: 941-755-6805
- Safe Place & Rape Crisis Center (SPARCC) – Sarasota: 941-365-1976
- First Call for Help- Manatee: 941-708-6488
- Sarasota & North Port 941-366-5025
- Manatee Glens: 941-782-4800

H. Web Portal Information: Every newly enrolled USF student receives an official USF e-mail account. Students receive official USF correspondence and Canvas course information via that address.
GENERAL INSTRUCTION FOR STUDENTS

How to communicate with me:
You can either (i) send me an email directly or through Canvas, or (ii) call me or (iii) set up an appointment to see me in my office. When emailing, please write the appropriate subject and please write your name at the bottom of the email. As a courtesy, please commence your email with a greeting such as “Dear Dr. Agarwal” or “Dear Prof. Agarwal”.

How NOT to communicate with me
Please don’t email me from a non-USF email account.
Please don’t submit deliverables to me through email. All deliverables must be submitted through Canvas.
Please don’t reply to an email that I send to the entire class without changing the subject unless your question is about that subject. If you are using the “Reply” button as a means to get my email address in the “To” line, please change the subject line and also delete all previous text from that email, if your email pertains to something else.
Please re-read your message to make sure there are no spelling or grammatical errors. The emails should be composed professionally.

How will I communicate with you?
I will use the Canvas to send you all emails pertaining to the course. I will reply to your emails within 24 hours. Occasionally emails do tend to go to my Junk Mail folder so if you have not received my response within 24 hours, please either resend your email or call my office phone number and leave a message in case I am not in my office.
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Description</th>
<th>Assignments/Quizzes</th>
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</table>
| 1    | 1/10  | Introduction to Big Data  
Introduction to Business Analytics  
Descriptive Analytics |                                          |
| 2    | 1/17  | Descriptive Analytics  
- Pivot Tables, Pivot Charts  
- Visualization  
- Tableau | Assignment - 1                         |
| 3    | 1/24  | Predictive Analytics: Classification Models  
- Neural Networks  
- Decision Trees  
- Using Rattle, Statistica, SPSS, RapidMiner | Quiz-1  
Article Presentation - 1 |
| 4    | 1/31  | Predictive Analytics: Clustering Models  
- K-Means  
- Agglomerative (Dendrograms)  
- Using Rattle, Statistica, SPSS, RapidMiner  
Predictive Analytics: Association Rule Mining  
Using Rattle, Statistica | Assignment - 2                            |
| 5    | 2/07  | Predictive Analytics: Statistical Models | Quiz-2  
Article Presentation - 2 |
| 6    | 2/14  | Predictive Analytics: Statistical Models, Design of Experiments, RapidMiner | Assignment - 3                            |
| 7    | 2/21  | **Mid Term**                                                                 |                                          |
| 8    | 2/28  | Text Mining                                                                 | Quiz-3                                    |
| 9    | 3/07  | **SPRING BREAK**                                                             |                                          |
| 10   | 3/14  | Sentiment Analysis  
Recommender Systems | Assignment - 4  
Article Presentation - 3 |
| 11   | 3/21  | Prescriptive Analytics: Optimization                                         |                                          |
| 12   | 3/28  | Prescriptive Analytics: Optimization continued                               | Assignment -5                             |
| 13   | 4/04  | Hadoop and MapReduce  
R, R-Hadoop | Quiz-4                                    |
| 14   | 4/11  | SQL vs. NoSQL Databases                                                      | Assignment -6  
Article Presentation - 4 |
| 15   | 4/18  | The Data Analytics Life Cycle  
Social Media Analytics  
Retail Analytics | Quiz-5                                    |
| 16   | 4/25  | Consulting Project Presentations (25 min. each)                              | Assignment -7                             |
| 17   | 5/02  | Web Analytics, Health Analytics  
Sports Analytics | Final                                     |