DECS 430-5: Business Analytics I  
Spring 2020  
Syllabus  

Professor Alvaro Sandroni  
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I. Course Description  

Analytics is the discovery and communication of meaningful patterns in data. This course will provide students with an analytics toolkit, covering concepts in probability and statistics while emphasizing the value and pitfalls of reasoning with data. Applications will focus on connections among analytical tools, data, and business decision-making.  

The two main objectives of the course are to (i) introduce probability concepts that directly impact managers’ decision making skills in uncertain environments, and (ii) introduce statistical concepts that lay the foundation for data analysis done in Business Analytics II (DECS 431).  

Students with a solid background in probability, statistics, and data work may prefer to waive DECS 430-5. Waiver exams will be given according to the Kellogg waiver exam schedule, communicated via Kellogg administration.  

II. Assignments, Assessment and Reading  

The deliverables for the course are the following.  

**Group Assignments** – A homework assignment will be given each week, to be completed prior to the next class session. The assignments will be worth 40% of the course grade. Assignments are due by 1:00pm of the next class. So, homework 1 is due at 1:00 pm of the second class. Homework 2 and 3 are due by 1:00 on the third and fourth class respectively. They are available on the course Canvas website and solutions must be submitted as .pdfs through that site (one per group with the names of all in the group). Each assignment is worth 20% of the course grade (for a total of 40%).  

**Final Exam** – Students should take the final exam on the last class. The final exam is worth 50% of the course grade. The remaining 10% is for class participation.  

**Reading** – Some articles that should be read before class. They can be found on the canvas page. Before the first class, please read the LSG Sky Chefs’ survey.
III. Classroom Etiquette, Honor Code, Participation, etc.

Due to the nature of this course, students will occasionally need to have access to their laptops or tablets during class. However, students should not use these devices for anything other than class work and no electronic devices should be in operation during class time. Students requesting exceptions should contact the professor prior to the first class.

Students are expected to abide by Kellogg’s Honor Code and Code of Student Etiquette at all times. Specific guidance on Honor Code issues will be provided during the quarter, as needed.

Participation is vital to the learning experience. Class participation and attendance includes being present and on time for class, the quality of your in-class contributions to discussion and also responses to in-class questions. I do “cold call” students in class. You should keep up with what has been going on in class and in the homework and be prepared for questions. Be sure to listen to your classmates. Helping others become stronger through your questions and comments is a key purpose of participation.

IV. Course materials

Materials for the course will be distributed via Canvas. There is no required textbook for the course. However, some students find it beneficial to have an additional source of material for reference. The optional textbook for the course is "Vital Statistics: Statistics for Business and Economics", by William Sandholm and Brett Saraniti, Oxford Univ. Press. Some classroom examples are taken from this text.

V. Office Hours, Communication and Contact Information

My office hours will be one hour before class starts. If you cannot visit during office hours, then write me an e-mail (sandroni@kellogg.northwestern.edu) to make an appointment. E-mail is the fastest and most reliable way to reach me outside of class. My office phone is 1-3729.

Questions about the material or administrative issues that are relevant to others should be posted in the course’s discussion board.

Optional TA review sessions will be held for students needing additional review of concepts. An announcement of times/locations will be made.

The class TAs is Jose Miguel Alvarado Onell  
<josealvarado2023@u.northwestern.edu>
Discussion Board

If you have any questions about the course material or the assignments that are not personal in nature, post them using the class Discussion Board on Canvas. This is to assure that all students receive the same help with the class. You are also encouraged to answer questions posted by other students; this is another form of class participation. All students should subscribe to the discussion board by going to the course Canvas site. Just click through to the discussion board and then click the forum titled “General Questions.” Near the top of the page a button labeled “subscribe” appears, click it to subscribe. When a message is posted to the discussion forum you should automatically receive an email alert with the content of the post. So, this will ensure that you are notified by email of discussion board posts.

VI. Course Schedule

Sessions 1 and 2 (First class)
Introduction and the Basics
- Data and Organizational Decision-Making
- Descriptive Statistics
- Rules of Probability
- Interpreting and Recognizing Conditional Probability

Independence I
- Random Variables
- Expected Value, Variance
- Probability Distributions
- The Portfolio Problem

Session 3 and 4 (Second Class)

Review of Rules and Probability and Independence I

Independence II
- Correlation and Covariance
- Business Applications of the Central Limit Theorem

Session 5 (Third Class)

Review of the Correlation and the Central Limit Theorem
Sampling I
- Inferential Statistics
- Sample Size
- Hypothesis Testing
- Confidence Intervals

Fourth class. Final exam
• Wrap-up, Summary and Review (bring your questions!)
• Exam