I. Course Description:

Analytics is the discovery and communication of meaningful patterns in data. This course will provide students with an analytics toolkit, reinforcing basic probability and statistics while throughout emphasizing the value and pitfalls of reasoning with data. Applications will focus on connections among analytical tools, data, and business decision-making. We will discuss concepts such as independence and sampling that are critical for understanding data in a business context. We will work on increasing students’ ability to work with data and understand the conclusions made from data analysis. This process will continue in the Business Analytics II (DECS 431) course.

Note that students with a solid background in probability, statistics and working with data may prefer to waive DECS 430-5. Waiver exams will be given according to the Kellogg waiver exam schedule.

II. Assignments and Assessment:

The deliverables for the course are listed below:

Homework Assignments – A homework assignment will be given at the end of each of the first four class sessions, to be completed prior to the next class session. Homework assignments #1 and #4 will be GROUP assignments. Group membership will be randomly determined and posted to the course website. Assignments #2 and #3 will be INDIVIDUAL assignments. Each assignment will be worth 10% of the course grade (for a total of 40%).

Final Exam – Students will take the final exam on Thursday, August 1st. The final exam is worth 60% of the course grade.
III.  **Classroom Etiquette, Honor Code, 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.

Classes will start promptly, and each student is expected to be prepared to begin at that time. Once class begins, you may leave the classroom only in case of an emergency. There will be a short break near the mid-point of each class session.

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.

IV.  **Communications and other items:**

- Email is the best way to reach me if you have a question about the course, homework assignments, etc. I will get back to you ASAP.
- The course website will contain announcements, readings, course materials, etc. It will be updated after every class. In particular, complete slides from each class session will be posted after class for your review.
- I will hold office hours each day of class, from 5:00 to 5:45, in a room TBD.
V. Schedule:

**Session 1: Introduction and the Basics**
- Data and Organizational Decision-Making
- Descriptive Statistics
- Rules of Probability
- Interpreting and Recognizing Conditional Probability

**Session 2: Independence I**
- Random Variables
- Expected Value, Variance
- Probability Distributions
- The Portfolio Problem

**Session 3: Independence II**
- Correlation and Covariance
- Business Applications of the Central Limit Theorem

**Session 4: Sampling I**
- Inferential Statistics
- Sample Size
- Hypothesis Testing
- Confidence Intervals

**Session 5: Sampling II**
- Sample Bias
- Adverse Selection
- Wrap-up, Summary and Review (bring your questions!)