Introduction to Business Analytics

ECB246 Block 4 2018

Cornell College

General

Location:	College 118	
Time:	Monday – Thursday :	9:30 – 11:00 a.m. & 1:00 – 2:30 p.m.
		Note: Day 1 will begin at 9 a.m.
	Friday:	9:30 – 12:30 p.m.
Instructor:	Cindy Bradley, Lecturer Business Analytics	
Office Hours:	M-Th. 3:00 – 4:00 p.m. Other times by appointment	
Office:	College Hall 216	
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Course Overview

The availability of massive amounts of data and substantial improvements in computing power has led to a dramatic increase in the use of analytical methods in business. Businesses want to use data to improve efficiency of operations, increase profitability, better understand their customers and gain a competitive advantage. This course provides an introduction to the various analytical methods being employed in business today to turn data into information for better decision making. The course will cover introduction to the areas of data visualization, descriptive data mining, linear regression, time series analysis and forecasting, predictive models and spreadsheet modeling.

Course Learning Objectives

The content of this course supports the Educational Priorities and Outcomes of Cornell College and places emphasis on the following educational priorities:

- *Communication* – You will develop communication skills by learning how to present the results of an analysis to a decision maker via written and oral communication.
- *Reasoning* – You will develop your reasoning skills by using descriptive, predictive and prescriptive analytical techniques to create insights from data, improve ability to more accurately forecast, to quantify risk, and to yield better alternatives through analysis and optimization.
- *Inquiry* – You will learn how data analytical techniques can be applied to real world problems across a variety of disciplines for better decision making.

Expectations of Students

No one starts off with data analysis skills or acquires these skills without effort. They are developed through training, experience and lots of practice. To be successful in this course you must put in the effort, be self-motivated and be willing to explore.

Attendance Policy

Daily attendance is HIGHLY encouraged and required to be successful in this class. Missing class will result in you falling significantly behind your peers. Daily assignments and weekly case projects will be distributed in class and successful completion of these projects requires daily classroom attendance. Absences for health, family-emergencies and college sponsored events are approved only with written notification. Each unexcused absence will result in a 25 point deduction in your final point grade.

Electronic Device Policy

We will spend considerable time on your laptops during this course. Come to class prepared with your laptop fully charged. Random web browsing or any unrelated use of electronic devices during class time is not acceptable. Other electronic devices (especially cell phones) may not be used in our classroom while class is in session. Abuse of the electronic device policy will impact your final grade to the same degree as being late to class.

Late Work Policy

No credit will be assigned to daily homework assignments that are turned in late. Weekly projects turned in late will receive 25% deduction if received within 24 hours of the deadline, 50% deduction within 48 hours and zero credit thereafter. **All assignments/projects are to be submitted through Moodle and a strict submission cutoff will be enforced (note that late projects will need to be submitted directly to me via email).** Keep in mind computers fail… at some point your computer will freeze/crash and you will lose something. This is **not** an excuse for late work. Get started early and save often!

Course Components

Daily assignments

On most class days I will distribute a take-home exercise to build on the content discussed in class. You can expect to spend 1-2 hours on each of these assignments. You should also plan to spend 1-2 hours per night with assigned readings. Assignments will be due the following morning by 8 a.m.

Weekly analytics projects

These projects are intended to develop your knowledge of the content discussed each week. For each project I will provide you with a business scenario, associated dataset and ask you to produce a number of different outputs, including a written management report of the results of your analysis to a potential decision maker. You can expect to spend around 4-5 hours outside of class completing these projects.

Mid-term & Final Exam

A mid term exam will be given on the second Friday of the block. A final (comprehensive) exam will be given in class during the final day of the block

Grading Policy

Daily assignments (10 @ 10 points each)		100 points
Mini case project (1 @ 100 points)		100 points
Weekly case projects with writing (3 @ 150 points each)		450 points
Mid-term Exam	100	~~200~~ points
Final exam		250 points
Total Points		1,000 points

Course grades will be based upon the following grading scale:

A	94-100%	B+	87-89%	C+	77-79%	D+	67-69%
A-	90-93%	B	84-86%	C	74-76%	D	64-66%
		B-	80-83%	C-	70-73%	D-	60-63%

Academic Integrity

Cornell College expects all members of the Cornell community to act with academic integrity. An important aspect of academic integrity is respecting the work of others. A student is expected to explicitly acknowledge ideas, claims, observations, or data of others, unless generally known. When a piece of work is submitted for credit, a student is asserting that the submission is her or his work unless there is a citation of a specific source. If there is no appropriate acknowledgement of sources, whether intended or not, this may constitute a violation of the College's requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in The Catalogue, under the heading "Academic Honesty."

Equality of Opportunity

Cornell College makes reasonable accommodations for persons with disabilities. Students should notify the Coordinator of Academic Support and Advising and their course instructor of any disability related accommodations within the first three days of the term for which the accommodations are required, due to the fast pace of the block format. For more information on the documentation required to establish the need for accommodations and the process of requesting the accommodations, see http://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml.

Resources

Textbook

Required

Business Analytics Third Edition – Camm, Cochran, Fry, Ohlmann, Anderson, Seeney and Williams (ISBN: 978-1337406420)

Software

You will be required to use a computer throughout this course. If you do not have a personal laptop, you should check one out through the library loaner laptop program. If you choose to use a personal computer for this class, the following software should be installed:

- **Microsoft Excel**: If you do not have Microsoft Excel, it is available for download via Cornell's Campus Agreement with Microsoft at https://products.office.com/en-us/student/office-in-education . Students will need to utilize their Cornell email address to obtain the software for free.
- **Analytical Solver –** Installation and license acquisition will be discussed the first week of class.

Help Outside of Class

If you encounter any problems or are struggling to learn Excel, please visit the Quantitative Reasoning Studio (QRS). Jessica Johanningmeier (JJohanningmeier@cornellcollege.edu) is the QRS director and can schedule a help session with her or a peer consultant.

Schedule Outline

Week 1: Descriptive Analytics

Date	Topics	Content	Deadlines
Day 1 Monday, November 26	Course Introduction Introduction to Business Analytics **Analytics in Practice** – *Moneyball*	Chapter 1	
Day 2 Tuesday, November 27	**Analytics Fundamentals**: Descriptive Statistics & Data Cleansing **Analytics in Practice** - Advanced Topics in Excel Workshop	Chapter 2	Assignment 1 (8 am)
Day 3 Wednesday, November 28	**Analytics Fundamentals**: Data Visualization – Part I **Analytics in Practice** – Analytical Technologies	Chapter 3	Assignment 2 (8 am)
Day 4 Thursday, November 29	**Analytics Fundamentals**: Data Visualization – Part II **Analytics in Practice** – The Relational Database & SQL Queries	*Effectively Communicating Numbers* – Few (See Moodle)	Assignment 3 (8 am)
Day 5 Friday, November 30	**Analytics in Practice** - Effective Business Writing	N/A	Assignment 4 (8 am)
Sunday, December 2			Project 1 9 p.m.

Week 2: Predictive Analytics

Date	Topics	Content	Deadlines
Day 6 Monday, December 3	Project 1 Review Intro to Predictive Analytics with Linear Regression	Chapter 9.1 Chapter 7.1 – 7.4	
Day 7 Tuesday, December 4	Predicting Continuous Variable – Linear Regression Analytics in Practice – Introduction to XLMiner	Chapter 7.5 – 7.10 & Appendix 7.1 & 9.1 (See Moodle)	Assignment 5 (8 am)
Day 8 Wednesday, December 5	Time Series Analysis & Using Regression for Forecasting	Chapter 8 Appendix 8.2 (See Moodle)	Assignment 6 (8 am)
Day 9 Thursday, December 6	Predicting Categorical Variable –Performance Evaluation Introduction to Logistic Regression	Chapter 9.2 - 9.3 Appendix 9.2 (See Moodle)	Assignment 7 (8 am)
Day 10 Friday, December 7	~~MidTerm Exam~~ Predicting Categorical Variable – Logistic Regression Classification and Regression Trees	Chapter 9.5 Appendix 9.4 (See Moodle)	Assignment 8 (8 am)
Sunday,			Mini Case

December 9			Project 9 p.m.

Week 3 – Prescriptive Analytics

Date	Topics	Content	Deadlines
Day 11 Monday, December 10	~~Project 2 Review~~ MidTerm Exam Mini Case Project Review No p.m. class ~~Intro to Prescriptive Analytics~~ ~~Prescriptive Model Formulation~~	~~Chapter 10~~	
Day 12 Tuesday, December 11	~~Linear Optimization Models~~ Intro to Prescriptive Analytics Prescriptive Model Formulation	~~Chapter 12~~ ~~Appendix 12.1~~ ~~(See Moodle)~~ Chapter 10	~~Assignment 8~~ ~~(8 am)~~ Project 2 Due 9 p.m.
Day 13 Wednesday, December 12	~~Linear Optimization Models~~ Introduction to Monte Carlo Simulation	~~Chapter 12~~ Chapter 11.1 – 11.2	~~Assignment 9~~ ~~(8 am)~~
Day 14 Thursday, December 13	Monte Carlo Simulation Introduction to Linear Optimization	Chapter 11.3 – 11.4 Chapter 12.1 – 12.2	~~Assignment 10~~ ~~(8 am)~~ Assignment 9 (8 am)
Day 15 Friday, December 14	~~Monte Carlo Simulation~~ Linear Optimization	Chapter 12.3 - 12.7	~~Assignment 11~~ ~~(8 am)~~ Assignment 10 (8 am)
Sunday, December 16			Project 3 9 p.m.

Week 4 – Wrap Up and Final Exam

Date	Topics	Content	Deadlines
Day 16 Monday, December 17	Project 3 Review **Analytics in Practice** –Ethics and Analytics	To be provided	
Day 17 Tuesday, December 18	Final Exam Review		
Day 18 Wednesday, December 19	Final Exam		