APPLIED BUSINESS ANALYTICS - Winter 2023
WENTWORTH INSTITUTE OF TECHNOLOGY
School of Computer/Data Science

Course Number: MGMT-7800
Instructor Name: Daniel Zielaski
Classroom: Virtual
Office Location: Virtual
Schedule: 5:00-6:20 PM Tuesdays
Online Appointments and Meetings: By appointment
Credits: 3/0/3
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Email address: zielaskid@wit.edu; dzielaski@gmail.com (please email both email addresses)

COURSE DESCRIPTION:
Business management is primarily about making decisions. Business analytics is a tool used in managerial decision making, involving data analysis methods that are useful to managers. Applied business analytics is thus about applying data analytics to managerial decision making. We will focus upon distinguishing between uncovering patterns in data and identifying the underlying drivers; and help you ask the important data science / mining questions. You will use data, data analytics concepts, techniques, and state-of-the-art tools to make faster and better business decisions. Data, statistical and quantitative analysis, exploratory and predictive models, and the Python programming language will be reviewed.

COURSE PREREQUISITES/COREQUISITES:
Students are expected/required to independently set-up and configure all required software.
Students are expected/required to use syntax appropriately.

REQUIRED TEXTBOOK(S):
Please see the list of articles from Harvard Business Review (HBR).

RECOMMENDED LEARNING MATERIALS (NOT REQUIRED):
Here are a few books that cover using Python for data science:

"Python for Data Science Handbook" by Jake VanderPlas: This book provides a thorough introduction to using Python for data science, including working with scientific libraries such as NumPy and pandas, and using Jupyter notebooks.

"Data Science from Scratch: First Principles with Python" by Joel Grus: This book covers the basics of data science and machine learning, including working with data in Python using libraries such as NumPy and pandas.

"Doing Data Science: Straight Talk from the Frontline" by Cathy O'Neil and Rachel Schutt: This book provides an overview of data science, including using Python for data manipulation, visualization, and machine learning.

"Python Data Science Cookbook" by Packt Publishing: This cookbook provides a collection of recipes for using Python for data science, including working with data, visualizing data, and applying machine learning algorithms.

COURSE LEARNING OUTCOMES
At or before the conclusion of the course, the student should be able to:

- recognize the key vocabulary employed by data science / mining
- ask key questions of a data science / mining team, allowing you to use their results for your business expertise - display knowledge and skills in the application of data warehouse and data mining technologies and methodologies in business
- understand and communicate the value of analytics across a variety of business functions
- have the skills to understand and illustrate business challenges, identify appropriate business data and apply data analytics to address challenges and solve problems
- demonstrate an understanding of big data and big data technologies as it applies to business data - present the knowledge and ability to apply the data analytics lifecycle in operational and strategic

capacities - identify and apply different analytical modeling techniques in the development of analytics solutions, and communicate those solutions effectively using data visualization techniques.

INSTRUCTIONAL METHODOLOGIES:

We will be using a combination of classroom and online instructional methodologies including but not limited to lectures (in person and recorded), discussions (classroom and online), and practical application.

ATTENDANCE POLICY:

Your attendance is expected and necessary to understand the materials and subject matter. If you miss more than one (1) class session without an Institute-approved excused absence, you may be officially withdrawn from the course.

GRADING POLICY:

Your final grade will be determined by computing your scores (in different components of the course) as follows: Course Component Weight Individual or Group

Homework (4) 30% Individual

Exams (2) 30% Individual

Team Project 25% Group

Participation 5% Individual

Attendance 5% Individual

Incentives/rewards 5% Individual

Total 100%

Grade Weight Numerical Definition Definition
A 4.00 93-100 Distinction
A- 3.67 90-92 High Pass
B+ 3.33 87-89 Pass
B 3.00 83-86 Pass
B- 2.67 80-82 Provisional
C+ 2.33 77-79 Provisional
C 2.00 73-76 Provisional
F 0.00 0-72 No Pass
P 0.00 Pass (for credit)
S 0.00 Satisfactory (no credit)
U 0.00 Unsatisfactory (no credit)
W 0.00 Withdrew
IC 0.00 Incomplete
NR 0.00 Not Reported
Grades of "P" or "F" are awarded to courses with this grading scheme and carry academic credit. "P" or "F" grades do not calculate into the GPA.
Wentworth does not offer students the option to audit a course; if a student is granted an exception to this policy the course cannot be converted at any time to a credit-bearing course and will not satisfy a degree requirement.

ADD/DROP:

Students should check the academic calendar to confirm the add/drop deadline. Dropping and/or adding courses is done online. Courses dropped in this period are removed from the student's record.

Non-attendance does not constitute dropping a course. If a student has registered for a course and subsequently withdraws or receives a failing grade in its prerequisite, **then the student must drop that course**. In some cases, the student will be dropped from that course by the Registrar. However, it is the student's responsibility to make sure that he or she meets the course prerequisites and to drop a course if the student has not successfully completed the prerequisite. The student must see his or her academic advisor or academic department chair for schedule revision and to discuss the impact of the failed or withdrawn course on the student's degree status.

MAKE-UP POLICY:

Make-up work is only allowed in the event of an Institute-approved excused absence.

ACADEMIC SUPPORT:
The Center for Academic Excellence facilitates Wentworth students' academic success and helps them to achieve their full learning potential. Students may choose to receive individual assistance through one-on-one tutoring in many subjects, including math, science, writing, and major classes. In addition, the Center for Academic Excellence offers Facilitated Study Groups (FSGs), tutor-led study tables, academic workshops, and learning-strategy consultations. The peer-tutoring program is certified by the College Reading and Learning Association's International Tutor Training Certification program. To make an appointment or to review our drop-in offerings, please visit www.wit.edu/cae. For additional assistance or support on subjects not listed, please reach out via email at cae@wit.edu.

ACADEMIC HONESTY STATEMENT:
Students at Wentworth are expected to be honest and forthright in their academic endeavors. Academic dishonesty includes but is not limited to cheating, prohibited collaboration, coercion, inventing false information or citations, plagiarism, tampering with computers, destroying other people's coursework or lab or studio property, theft of course materials, posting coursework/course materials to websites, or other academic misconduct. If you have any questions, contact your professor prior to submitting an assignment for evaluation. See your academic catalog for a full list of definitions and the WIT Academic Honesty website for the procedures: wit.edu/academic-honesty.

STUDENT ACCOUNTABILITY STATEMENT:
We are all adults: show up on time, do your work, ask me questions, and don't cheat.

THE CENTER FOR WELLNESS:
College can be challenging and it is common to feel overwhelmed or stressed at times. If these feelings are related to course work or academic performance, please talk to me. For more significant mental health concerns, **The Center for Wellness (003 Watson Hall*, 617-989-4390)** provides free and confidential mental health counseling.

If you or someone you know needs support around thoughts of suicide, the following resources are available:

- The Center for Wellness, Watson 003*, 617-989-4390, M-F 8:15-4:45
- BeWell@WIT 24/7 telecounseling, 617-989-4390 option #2
- Campus Police, First level of 610 Huntington Avenue, 617-989-4444, 24/7
- Samaritans, call or text 1-877-870-4673
- Crisis Text Line, text "start" to 741-741
- National Suicide Prevention Lifeline, call 1-800-273-8255
- GLBT Youth Hotline, call 1-866-488-7386
- Beth Israel Deaconess Emergency Room, 190 Pilgrim Rd Boston, MA

Students requiring academic accommodations must provide an official accommodation memo from **The Center for Wellness (003 Watson Hall*, 617-989-4390)** and contact me privately to discuss logistics.

***** The Center for Wellness will be providing mental health counseling sessions and accessibility services appointments virtually and appointments can be scheduled by calling 617-989-4390. The Center for Wellness is open for mental health emergencies. Additionally, 24/7 emotional support is available by this same phone line. Thank you for keeping our community safe and healthy by following these procedures.

COLLEGE OF THE FENWAY STUDENTS:
If you are enrolled in this course through COF Cross Registration, notify your course instructor. Please provide her/him with your email address to be sure that you receive course information in a timely way. You should also discuss how to access online applications that might be used in the course.

SYLLABUS OUTLINE

Week	Topic	Readings (please complete prior to the class)	Assignments (due at the beginning of the following class)
1 Jan 3	Introduction to Applied Business Analytics; descriptive statistics	Please read HBR articles on "descriptive statistics".	Assignment 1 - Descriptive Statistics
2 Jan 10	Correlation	Please read HBR articles on "correlation".	Assignment 2 - Correlation
3 Jan 17	Linear regression and forecasting	Please read HBR articles on "linear regression".	Assignment 3 - Linear regression
4 Jan 24	Multiple regression and forecasting	Please read HBR articles on "multiple regression".	Assignment 4 - Multiple regression
5 Jan 31	Logistic regression	Please read HBR articles on "logistic regression".	Assignment 5 - Logistic regression

6 Feb 7	Means comparisons and experimental protocols, part 1 - ANOVA	Please read HBR articles on "ANOVA".	Assignment 6 - ANOVA
7 Feb 14	Means comparisons and experimental protocols, part 2 - ANCOVA	Please read HBR articles on "ANVOCA".	Assignment 7 - ANCOVA
8 Feb 21	Conjoint analysis	Please read HBR articles on "conjoint analysis".	Assignment 8 - Conjoint analysis
9 Feb 28	Advanced visualizations	Please read HBR articles on "advanced visualizations".	Assignment 9 - Visualizations
10 Mar 7	Ethics and applied business analytics	N/A	N/A
11 Mar 14	BY WEEK	BY WEEK	BY WEEK

12 Mar 21	Combining methods	N/A	Assignment 10 - Comprehensive
13 Mar 28	Big data, machine learning, AI, and deep learning	N/A	
14 Apr 4	Comprehensive presentation	N/A	Group presentation
15 Apr 11	Final examination		