DSCI 5260.002 ONLINE
Business Process Analytics
Spring 2020

CLASS (DAY/TIME/PLACE): 100% Online
PROFESSOR: Valarie J. Bell, Ph.D., Computational Social Scientist
TEACHING ASSISTANT: Xinyu (Eddy) Wei at Xinyu.Wei@unt.edu
E-MAIL: Valarie.Bell@unt.edu

DR. B’S OFFICE HOURS: 5:00 to 6:30 pm Wednesdays & 10 am - 2pm Thursdays in 365D; or via zoom weblink by appointment; or via text, phone, or email messages and response will be within 24 hours.

T.A. (Eddy’s) OFFICE HOURS: 11 am - Noon Mondays & 11 am - Noon Fridays
CELL PHONE: 630-853-4089 (send a text first identifying yourself & the issue-- don't actually call first) (My office phone does not work so if you call it you will not receive a response.)

COMMUNICATING WITH DR. BELL:
I may be reached via the email or mobile phone shown above. I will generally return most emails the same morning/afternoon they are received. However, expect to receive a response within 24 hours unless contacting me 1) on a holiday; 2) when the University is closed; or, 3) after 5pm on Friday through Sunday evening. In such instances, your email will be returned on the next UNT school day. When contacting me via mobile phone, please first text me rather than calling and then identify yourself by first & last name as well as the course & section (e.g., 3610.007). Briefly explain the issue pose your question. You should reserve texts for time-sensitive matters & emergencies. Any texts will generally be returned within 4 hours unless that text is received Monday-Thursday after 6:30pm when I am in class, on a holiday/when the University is closed, or after 5pm on Friday through Sunday evening.

REQUIRED TEXTS:

By: Manuel Laguna & Johan Marklund: Publisher: Chapman & Hall. Print ISBN: 9781138061736, 1138061735

Additional reading materials and resources can be found in Canvas.

COURSE DESCRIPTION:

This course is aimed at helping students improve their mastery of various analytics tools (i.e., software programs & programming/statistical languages) and approaches. The foundations for this are decision sciences/analytics methodologies, programming languages such as Python, industry-standard statistical software (e.g., SPSS and SAS), as well as emerging and cutting-edge tools, techniques, and paradigms.

Students will, within the context of forming their own professional analytics consulting firms, develop analysis plans detailing their approaches, and then apply those analysis plans to three separate real-world analytics projects. Each firm's project will conclude with a professional quality presentation. Throughout the course, emphasis is placed on documenting and demonstrating, from the very onset, the ethical manipulation, processing, and modeling of data for purposes of tackling business questions and challenges as a cohesive, analytics team.
Course Schedule

Course intro; 3 projects' overview; consulting firm requirements; Statistical Analysis Plan Template (SAP); Git Hub/E-Lab Book; Students complete 1) Data Analytics Tools assessment; and, 2) Types of Business Analysis assessment; Choose consulting firm partner(s) & come up with a firm name.

Documenting each step in the analytics consulting process; communicating w/client/stakeholders; Specific SAP elements incl. ethical concerns (vis a vis pressure to provide certain results/outcome), data imputation, outliers; ethics standards for consultants (ASA, DAA, IDEAS, DSI)

Human factors in analytics consulting: Considering social & social psychological factors in data; Dealing with considerations of bias-- conscious & unconscious (in collaboration/interactions; decision-making; assumptions); successful diverse teams communication; soft skills; IAT-- various assessments. Student Course Evaluation #1 due January 30, 2020: submit to Canvas

Discuss Consulting Project #1 (gather existing data) guidelines and requirements; Gathering appropriate data; evaluating data quality; sites & sources with quality data-- public & private; ICPSR; Census.gov/ACS; BJS; data.gov; NLSY; govt bureaus; city data portals; Kaggle; Take time in class for firms to explore possible data sources

Time-management for analytics projects and consulting; analytics consulting best practices; allocating work & delegating

Data prep & cleaning; Transparency & Trackability-- documenting the entire process for audit

Introduction to Artificial Intelligence Part I: machine learning types, incl deep; algorithms; sci-kit learn

Consulting Project #1 due March 3, 2020: submit to Canvas

Intro to AI Part II; in-class presentations of Project #1; Student Course Evaluation #2 due March 6, 2020: submit to Canvas

March 9-13

Spring Break

Intro to AI Part III: Deep learning

Intro to AI Part IV: neural networks

Intro to AI: Part V: Miscellaneous/review

Consulting Project II due April 7, 2020: submit to Canvas

Social Analytics Part I: social media analytics; in-class presentations of Project #2; Student Course Evaluation #3 due April 7, 2020: submit to Canvas
### Grade Determination

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytics projects: 3 @ 150 pts ea</td>
<td>450</td>
</tr>
<tr>
<td>Analysis Types Self-Assessment-Start of Term 25 pts ea</td>
<td>25</td>
</tr>
<tr>
<td>Analytics' Tools Self-Assessment-Start of Term 25 pts ea</td>
<td>25</td>
</tr>
<tr>
<td>Analysis Types Self-Assessment-End of Term 25 pts ea</td>
<td>25</td>
</tr>
<tr>
<td>Analytics' Tools Self-Assessment-End of Term 25 pts ea</td>
<td>25</td>
</tr>
<tr>
<td>Peer-review of consulting projects: 3 @ 50 pts ea</td>
<td>150</td>
</tr>
<tr>
<td>Student evaluations of course: 3 @ 25 pts ea</td>
<td>75</td>
</tr>
<tr>
<td>Statistical Analysis Plan: 1 @ 125 pts ea</td>
<td>125</td>
</tr>
<tr>
<td>Analytics Portfolio: 1 @ 100 pts ea</td>
<td>100</td>
</tr>
<tr>
<td>Total Points</td>
<td>1000</td>
</tr>
</tbody>
</table>

A rubric(s) for assignments and written work will be posted on Canvas.

Course average based on all submitted work

- $90\% \geq 900 = A$
- $80\% \geq 800 = B$
- $70\% \geq 700 = C$
- $60\% \geq 600 = D$
- Below $60\% = F$
COURSEWORK

Self-Assessments (2 at start of course & 2 at the end of course):

To enable students to get the most out of the course, at the start of the semester each student will complete two self-assessment. The first assessment is "Types of Business Analysis" and the second is "Data Analytics Tools." Students should carefully complete these forms: 1) they will determine a degree of their coursework; 2) improving skills in these areas requires accurate evaluation of them; and 3) all responses will impact material and depth of coverage.

When rating, if a student cannot rate themselves at a 4 or 5 then they should not put that tool or analysis type on their resume/cv. Ratings less than 4 signify a need for greater student focus on improving their knowledge and practice in an area. A skill or analysis on a resume or cv tells a prospective employer that your skills are so honed and valuable that they are worth paying for.

Again semester's end, students will retake both assessments to evaluate how much they have improved their skills and knowledge as a result of the course. All four assessments are worth 25 points each.

Peer-review of consulting projects (3 during the course):

To provide students with a further opportunity to develop their analytical and critical thinking skills within the context of real-world organizational decision-making and problem-solving, each student will individually complete a peer-review form evaluating various pre-determined criteria as determined by the professor. Students will review each firm's projects by observing their presentation of each project. All three reviews are worth 50 points each.

Student evaluations of course (3 during the course):

To ensure that the professor is effective and efficient in ensuring students' understanding and application of the course material and to provide students with the opportunity to recommend additions and changes to the progression of the course, at three points during the course each student will log into Canvas to complete a student evaluation of the course. Those dates are as follows: January 30, March 6, and April 7. All three evaluations are worth 25 points each.

Statistical Analysis Plan (1 during the course):

To better prepare students for their careers and to provide them with the opportunity to complete an assignment in which they investigate, compare, and select professional standards and guidelines to apply to professional quality decision-making and analysis, each student will work with their fellow consulting firm members to research and prepare a consulting firm analysis plan.

An analysis plan is a document, usually in word or pdf form, that serves as a professional analyst's rulebook. It contains their policies and procedures for managing and analyzing data. For example, how will outliers be determined and dealt with, how will statistical significance or an optimal model outcome be determined, and what modeling paradigm or philosophy or philosophies that the analyst adheres to in their work. It also contains an ethical statement or the ethical guidelines to which the analyst adheres in their practice; usually these guidelines are cited from the professional association or governing body in that analyst's field.

Examples of analysis plans will be covered in the course. Each consulting firm must complete their own statistical analysis plan and then apply it to their three consulting projects. The statistical analysis plan is worth 125 points.
Analytics Portfolio (1 during the course):

Students will be expected to incorporate the professor's guidelines and criteria in preparing a digital professional portfolio of their work, suitable for including on their LinkedIn account, social media account(s) and linking via their emails, resume/cv, and business cards.

Examples will be provided in class and students can choose the digital platform of their preference. This portfolio will be reviewed by the professor who will provide extensive feedback on content, format, and structure. The portfolio assignment is worth 100 points: 50 points for the first version/iteration and 50 points for the revised/edited portfolio iteration.

Consulting Projects (3 during the course):

*Consulting Project #1:* Each firm is to gather existing data to analyze for purposes of a real-world consulting project.

*Consulting Project #2:* Each firm is to collect their own data rather than simply analyzing secondary data. Qualitative and quantitative data must be analyzed for this project.

*Consulting Project #3:* Each firm must combine secondary data with their own data as well as analyzing qualitative and quantitative data for this project.

Each project requires that a written report be submitted as well as a power point presentation. The professor will provide a general final report template that each consulting firm should use and alter to fit their projects.

Each firm will submit one paper report and one set of slides per project to Canvas. Each member of the consulting firm must equally participate in the presentation phase of each project. Each project (including paper, slides and presentation) is worth 150 points each.

More details on the projects, including the rubrics will be posted in Canvas and discussed by Dr. Bell.

**SOME TOOLS & TOPICS WE WILL COVER**

In addition to the above, the class will explore/research new methodologies and tools relevant to Analytics/Decision Sciences and your projects such as:

- **SAS, SPSS** (variety of models)
- **Tableau** (Data visualization; data prep/cleaning)
- **Python** (Machine learning, deep learning, neural networks; text analysis; unstructured data)
- **Anaconda & Jupyter Notebook** (use w/Python)
- **Rapid Miner** (machine learning; data mining; text analysis; unstructured data)
- **Misc:** skikit-learn; Julia; social media analytics/social analytics
OBJECTIVES

1. Assess each student's current analytics' tools' proficiency level.
2. Assess each student's current analytics' methods proficiency level.
3. Demonstrate project management skills.
4. Develop and demonstrate analytics' project documentation and presentation skills.
5. Develop and demonstrate business 'soft skills.'
6. Utilize statistical software and Python in your analytics' projects.
7. Develop and demonstrate the ability to identify quality data & quality sources of data.
8. Improve one's proficiency of at least two existing analytics' tools.
9. Improve one's proficiency of at least two existing analytics' methods.
10. Develop more effective oral and written presentation skills for presenting findings to non-technical/non-analytical audiences and stakeholders.
11. Effectively collect, clean, prepare, analyze and report analytics' findings.
12. Demonstrate the ability to effectively collaborate on team projects within a strict deadline.
13. Effectively document each step of the data collection, preparation, and analysis process to enable replication.

DEPARTMENT & COLLEGE POLICIES

1. To be eligible for enrollment, students must have satisfied all of the following requirements: Completion of core business courses.
2. If you wish to register a complaint, you should first discuss your complaint with me. If you wish to carry it further, see Dr. Leon Kappleman, ITDS Department Chair, but only after discussing it with me.
3. As a general rule NO MAKE-UP EXAMS. The course grade of "I" is not given except for rare and very unusual emergencies, as per university guidelines.
4. The University policy on Code of Conduct and Ethics is contained in the Student Guidebook. You are responsible for knowing the information contained in this and all other official University publications.

Cheating on a minor assignment (such as homework or daily assignment) would result in a zero for that assignment. Cheating on a major assignment (such as an exam or term paper or take-home case presentation) would result in an F in the course and referral of the matter to the Committee on Student Conduct in the office of Vice President for Student Development.

5. Students with Disabilities: The College of Business Administration complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disability. If you have an established disability, as defined in the "Act" and would like to request accommodation, please see me as soon as possible. My office hours and office number are at the top of this syllabus.
6. Dates of drop deadlines, final exams, etc., are published in the university catalog and the schedule of classes. Please be sure you keep informed about these dates.
7. This course adheres to the UNT policy on academic integrity. The policy can be found at http://vpaa.unt.edu/academic-integrity.html.
UNT College of Business Student Ethics Statement

As a student of the UNT College of Business, I will abide by all applicable policies of the University of North Texas, including the Student Standards of Academic Integrity, the Code of Student Conduct and Discipline and the Computer Use Policy. I understand that I am responsible reviewing the policies as provided by link below before participating in this course. I understand that I may be sanctioned for violations of any of these policies in accordance with procedures as defined in each policy.

I will not engage in any acts of academic dishonesty as defined in the Student Standards of Academic Integrity, including but not limited to using another’s thoughts or words without proper attribution (plagiarism) or using works in violation of copyright laws. I agree that all assignments I submit to the instructor and all tests I take shall be performed solely by me, except where my instructor requires participation in a group project in which case I will abide by the specific directives of the instructor regarding group participation.

While engaged in on-line coursework, I will respect the privacy of other students taking online courses and the integrity of the computer systems and other users’ data. I will comply with the copyright protection of licensed computer software. I will not intentionally obstruct, disrupt, or interfere with the teaching and learning that occurs on the website dedicated to this course through computer “hacking” or in any other manner.

I will not use the university information technology system in any manner that violates the UNT nondiscrimination and anti-sexual harassment policies. Further, I will not use the university information technology system to engage in verbal abuse, make threats, intimidate, harass, coerce, stalk or in any other manner which threatens or endangers the health, safety or welfare of any person. Speech protected by the First Amendment of the U.S. Constitution is not a violation of this provision, though fighting words and statements that reasonably threaten or endanger the health and safety of any person are not protected speech.

Student Standards of Academic Integrity
http://policy.unt.edu/sites/default/files/untpolicy/pdf/7-Student_Affairs-Academic_Integrity.pdf

Code of Student Conduct and Discipline

Computer Use Policy: http://policy.unt.edu/policy/3-10

By signing below, I acknowledge my responsibility to read the UNT academic dishonesty policy and the Student Standards of Academic Integrity (https://policy.unt.edu/policy/06-003); and attest that I have read and understand the statements in this document and agree to behave ethically in this class.

____________________________________________________  ____________________________
Student Name (Print)                     Student ID No.

____________________________________________________  ____________________________
Student Signature
ETHICAL ACADEMIC BEHAVIOR IN ITDS CLASSES

The UNT College of Business and the ITDS Department expect their students to behave at all times in an ethical manner. There are at least two reasons for this. First, ethical behavior affirms the personal value and worth of the individual. Second, professionals in all fields (but particularly in information systems, accounting, and HR) frequently handle confidential information on behalf of their employers and clients. Thus employers of UNT College of Business graduates expect ethical conduct from their employees because that behavior is crucial to the success of the organization. Academic dishonesty is a major violation of ethical behavior.

Students are expected to read (https://policy.unt.edu/policy/06-003) UNT’s Student Standards of Academic Integrity which defines academic dishonesty and sets out the consequences for unethical academic behavior. Cheating and plagiarism are the most common types of academic dishonesty.

The UNT’s Student Standards of Academic Integrity policy defines cheating as: The use of unauthorized assistance in an academic exercise, including but not limited to:

1. Use of any unauthorized assistance to take exams, tests, quizzes or other assessments;
2. Dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems or carrying out other assignments;
3. Acquisition, without permission, of tests, notes or other academic materials belonging to a faculty or staff member of the University;
4. Dual submission of a paper or project, or re-submission of a paper or project to a different class without express permission from the instructor;
5. Any other act designed to give a student an unfair advantage on an academic assignment.

The university’s policy defines plagiarism as the “Use of another’s thoughts or words without proper attribution in any academic exercise, regardless of the student’s intent, including but not limited to:

1. The knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgement or citation.
2. The knowing or negligent unacknowledged use of materials prepared by another person or by an agency engaged in selling term papers or other academic materials.

Examples of academic dishonesty in an ITDS class include: copying answers from another person’s paper; using notes during an exam; copying computer code from another person’s work; having someone else complete your assignments or take tests on your behalf; stealing code printouts, software, or exams; recycling assignments submitted by others in prior or current semesters as your own; and copying the words or ideas of others from books, articles, reports, presentations, etc. for use as your own thoughts without proper attribution (i.e., plagiarism). It does not matter whether you received permission from the owner of the copied work; claiming the material as your own is still academic dishonesty.

The ITDS Department believes it is very important to protect honest students from unfair competition with anyone trying to gain an advantage through academic dishonesty. Academic dishonesty is not tolerated in ITDS classes, and those who engage in such behavior are subject to sanctions as outlined in the UNT’s policy and/or the course syllabus. You are strongly encouraged to read the policy carefully so that you are aware of what constitutes academic dishonesty and the consequences of this unethical behavior.

By signing below, I acknowledge my responsibility to read the UNT academic dishonesty policy and the Student Standards of Academic Integrity (https://policy.unt.edu/policy/06-003); and attest that I have read and understand the statements in this document and agree to behave ethically in this class.

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Student Name (Print)                     Student ID No.

____________________________________________________  ____________________________
Student Signature        Date