Data Analytics: Principles and Tools (CS 2034)

Course Information
Term: Winter 2017
Lecture: 1:30 – 3:30pm
Location: HSB-236
Labs: For lab times and locations, see the online timetable
Instructor: Oluwakemi Ola
Email: oola@uwo.ca
Office: Middlesex College Rm #27A
Office Hours: by appointment only

Course Description
Traditional Version:
A comprehensive and interdisciplinary introduction to data analytics using modern computing systems, with equal attention to fundamentals and practical aspects. Topics include sources of data, data formats and transformation, usage of spreadsheets, statistical analysis, pattern recognition, textual analysis, data mining, big data, and methods for data presentation and visualization.

Twitter Version:
Data is constantly being generated but not effectively used #Problem
Society needs people who can make sense of this data #Solution
An interdisciplinary active learning approach is used to pass on key concepts and skills #Process and no #PriorSkills is required

Student Learning Outcomes
By the end of this course, students will be able to

- Describe types, sources, and facets of data
- Use spreadsheets macros to analyze data
- Utilize programming constructs to process data
- Explain relevant statistical analysis and machine learning techniques
- Evaluate different visual artifacts for data presentation
- Choose data analytics tools appropriate for data problems

Course Prerequisites
There are no prerequisites to CS2034.

Course materials
Readings will be assigned during the course.
Course Website
The CS2034B website is accessible through OWL: https://owl.uwo.ca/portal
Announcements, assignments, labs, lecture notes, and other course-related information will be posted on
this website. It is the responsibility of the student to check this website often.

Course Structure
This course is comprised of three main components, namely:—in-class sessions, lab sessions, and student
deliverables.

- **In-Class Sessions** will expose students to a variety of data analytics topics primarily through a
lecture-based format.

- **Lab Sessions** are designed to equip students with data analytics skills through the use of hands-on
exercises. Teaching assistants will facilitate the sessions, help troubleshoot, and support your
learning process.
  - Labs are mandatory and each student is required to attend the lab session for which you
    are registered.
  - There will be no make-up labs, and students who are absent for a lab do not have the
    option of attending another lab; however, students who encounter serious health or
    other personal difficulties are encouraged to contact their Dean's office.
  - There are 10 labs total but only your top 8 scores will be used.
  - Students must bring their UWO identification to all labs.

- **Student Deliverables**: being that this course is driven by the data problems that plague society in
the 21st century, it is crucial that students not only understand principles but also the nuances
that challenge society and existing solutions. To this end, the student deliverable component of
this course will seek to demonstrate how well each student understands the content as well of its
application to existing problems.
  - Assignments help ascertain student’s ability to transfer knowledge learned in labs to real-
    world situations.
  - Exams as scheduled by the Office of the Registrar are cumulative student evaluations that
    provide a structured assessment of learning.
  - Formal Student Feedback will be in the form of questionnaires which will be incorporated
    to help improve your learning experience.

- There will be no make-up assignments. If there are other serious medical or compassionate
  grounds for missing an assignment, please take supporting documentation to the office of the
  Dean of your faculty, who will contact the instructor. In such cases, the weight of your missed
  assignment may be shifted to the other assignments.
Your understanding of the course content will be assessed based on the following structure,

**Student Evaluation** (tentative dates)

<table>
<thead>
<tr>
<th>Element</th>
<th>Weight</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labs</td>
<td>16%</td>
<td>Weekly throughout the term, except Reading week Labs start week of January 16th</td>
</tr>
<tr>
<td>Assignment 1</td>
<td>5%</td>
<td>Monday, February 6th (9pm)</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>10%</td>
<td>Monday, March 6th (9pm)</td>
</tr>
<tr>
<td>Assignment 3</td>
<td>14%</td>
<td>Monday, April 3rd (9pm)</td>
</tr>
<tr>
<td>Mid-Term</td>
<td>20%</td>
<td>Tuesday, February 14th</td>
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<tr>
<td></td>
<td></td>
<td>Time: 1:30 – 3:30 pm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Location: Elborn College 2168A and 2168B</td>
</tr>
<tr>
<td>Final</td>
<td>35%</td>
<td>3 hours; TBD</td>
</tr>
</tbody>
</table>

**IMPORTANT NOTE:** To be eligible to receive a passing grade in the course, your mark on the final exam must be at least 40%, and your weighted average on the assignments must be at least 40%. Otherwise, the maximum overall mark you can receive is 45%. To be eligible to receive a grade of 60% or higher, your mark on the final exam must be at least 50%, and your weighted average on the assignments must be at least 50%. Otherwise, the maximum overall mark you can receive is 58%.

**Assignments**

**Submission:**
- Instructions for the submission of assignments will be posted on the course website. It is each student’s responsibility to read and follow the instructions. Failure to follow the submission instructions may result in the assignment receiving a mark of zero.
- You will be required to submit each assignment electronically through OWL.

**Due dates:**
- The date and exact time assignments are due will be given in the assignment specifications.
- The late penalty for assignments is 10% per day late, for a maximum of 2 days, after which assignments will not be marked. Weekends count as one day of lateness.
- No extensions will be given for assignments; however, if a student has serious medical or compassionate grounds, they should take supporting documentation to the Office of the Dean of their faculty and their instructor will be contacted.

**Marking:**
- Assignments are marked by the Teaching Assistants, who follow marking schemes which I provide them.

**Re-marking:**
- Appeals of assignment marks should be addressed to the teaching assistant first. If you and the teaching assistant cannot agree, then the teaching assistant will discuss the situation with me, the lecturer.
- At this point, I will inform you by email when the reevaluation process is complete. This could take up to two weeks. **It is important to mention that the reevaluation can result in an increase or decrease in your score, and once done, the new score is final.**
• The initial request for adjustment (made to the Teaching assistant) must be made within a week of the date on which it was first available after marking. (Beyond that date, regrading will not be considered, regardless of when you retrieved your assignment.)

It is each student’s responsibility to keep up-to-date backups of assignment disk files in case of system crashes or inadvertently erased files. Students must keep disk copies of all material submitted, as well as the actual graded assignment, to guard against the possibility of errors in recording marks. It is not safe to discard these materials until you are satisfied that your final mark for the course has been computed properly.

If for any reason an assignment is cancelled for the class, then the grades for the remaining assignments will be re-weighted to account for the total weight for the assessment type.

Exams
• There is a midterm exam and a final exam. No electronic devices will be allowed. Students are allowed to bring one single-sided letter-size original hand-written page of notes.
• Students must bring their UWO identification to the exams.
• There will be no makeup midterm exam, except for students requesting a special midterm exam for University recognized reasons. These students must have notified the course instructor and filed documentation with their Dean’s Office at least 2 weeks prior to the midterm exam. If there are other serious medical or compassionate grounds for missing the midterm exam, please take supporting documentation to the office of the Dean of your faculty, who will contact the instructor. In such cases, the weight of your midterm exam may be shifted to the final exam, which would then be worth 55% of your final overall grade.
• The final exam is scheduled by the Office of the Registrar during the final exam period. Students are advised not to make travel plans until they have consulted the final exam schedule.
• Computer-marked multiple-choice exams may be screened for similarity by software that checks for unusual coincidences in answer patterns that may indicate cheating.

TA Consulting Schedule
Teaching Assistants and their consulting hours for CS2034 will be posted on the course website and announced during the second or third week of the term once information is available to the instructors.

Email Contact
We may need to send email messages to the whole class or to students individually. Email will be sent to the UWO email address assigned to students by Information Technology Services (ITS) (user_name@uwo.ca). It is the responsibility of the student to read this email on a regular basis.

Note that UWO and most other email providers establish quotas or limits on the amount of space available to you. If you let your email accumulate there, your mailbox may fill up and you may lose important email from your instructors. Losing email is not an acceptable excuse for not knowing about the information that was sent.

Students are encouraged to contact their course instructor via email with brief, email appropriate questions regarding personal issues relating to the course. Issues related to lecture materials or clarification of assignments MUST be posted in the appropriate forum on OWL.
Before sending an email to an instructor, the student should check the course website (either the outline or forums) to see if the requested information is already there. Students MUST send email from their UWO ITS account and include CS2034 in the subject line of the email.

Academic Accommodation for Medical Illness or Distress
If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to your Dean’s office as soon as possible and contact your instructor immediately. It is the student’s responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean’s Office immediately. For further information please see: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record’s Release Form (located in the Dean’s Office) for visits to Student Health Services. The form can be found here: https://studentservices.uwo.ca/secure/medical_document.pdf

Students who are in emotional/mental distress should refer to Mental Health@Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.

Accessibility Statement
Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

Course, Department, University Policies on Ethical Conduct
Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf

- Plagiarism: Students must write their assignments in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see the Scholastic Offence Policy in the Western Academic Calendar).
- Your assignments must be your own individual work, not the products of group effort. You may discuss approaches to problems with other students, but the work you submit (programming code, answers to concept questions, etc.) must be an individual effort.
- With each assignment, you are required to confirm that you did the material you have submitted is exclusively your own work and that you understand the course policies concerning plagiarism and individual effort. You are responsible for reading and respecting the departmental policies on Scholastic Offences and Rules of Ethical Conduct. The University of Western Ontario uses software for plagiarism checking.
• The standard departmental policy for assignments that are judged to be the product of academic dishonesty is, for the student's first offence, a mark of zero for the assignment, with an additional penalty equal to the weight of the assignment also being applied to the overall grade.
• The role of tutoring is to help students understand course material. Tutors should not write assignments or take-home tests for the students who hire them. Submitting an assignment that contains material written by a tutor is an academic offence. Having employed the same tutor as another student is not a legitimate defense against an accusation of collusion, should two students hand in assignments judged similar beyond the possibility of coincidence.