



UNIVERSITY OF CALGARY
FACULTY OF SCIENCE
DEPARTMENT OF COMPUTER SCIENCE
COURSE OUTLINE

1. **Course:** CPSC 599.87, Special Topics in Computer Science -- Winter 2018

Lecture 05: (TR, 09:30-10:45 in TISTUDIOB)

| Instructor Name | Email | Phone | Office | Hours |
|-----------------|----------------------------|-------|--------|-----------------------|
| Wesley Willett | wesley.willett@ucalgary.ca | | MS680D | Thursdays 13:00-15:00 |

Topic: Visualization and Analytics

The course will cover the full data analysis lifecycle from collection to reporting, focusing on the practical application of analysis techniques and tools to real-world data. Topics include:

- Data Collection.
- Data Cleaning and Integration.
- Statistical Analysis.
- Statistical Modelling, Classification, and Clustering.
- Exploratory Data Analysis.
- Presentation.
- Analysis of Geographic, Text, and Temporal Data
- Data and Ethics.

Course Site:

Department of Computer Science: ICT 602, 403 220-6015, cpsc@cpsc.ucalgary.ca

Students must use their U of C account for all course correspondence.

2. **Prerequisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

Consent of the Department.

CPSC 319 or 331 (Data Structures, Algorithms, and their Applications/Analysis)

3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

| Component(s) | Weighting % |
|-----------------------------|-------------|
| Assignments / Datathons | 50% |
| Analysis Case Study | 10% |
| Individual Analysis Project | 40% |

Each of the above components will be given a letter grade using the official university grading system. The final grade will be calculated using the grade point equivalents weighted by the percentages given above and then converted to a final letter grade using the official university grade point equivalents.

4. **Missed Components of Term Work:**

The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself with these regulations. See also [Section E.3](#) of the University Calendar

5. **Scheduled out-of-class activities:**

There are no out-of-class activities scheduled for this course.

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a conflict with the out-of-class-time-activity, please contact your course coordinator/instructor no later than **14 days prior** to the date of the out-of-class activity so that alternative arrangements may be made.

6. **Course Materials:**

There will be no required text book(s). Material will be taken from books and research papers. If you are interested in reading more and having a useful reference for some of the topics covered in the class, I recommend:

- *Data Science from Scratch* by Joel Grus. Oâ€™™ Rielly Media. 2015.
- *Data Points* by Nathan Yau. Wiley. 2013.
- *Visualization Design and Analysis* by Tamara Munzner. CRC Press. 2014.

7. **Examination Policy:**

No aids are allowed on tests or examinations

Students should also read the Calendar, [Section G](#), on Examinations.

8. **Approved Mandatory and Optional Course Supplemental Fees:**

There are no mandatory or optional course supplemental fees for this course

9. **Writing across the Curriculum Statement:**

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of those reports. See also Section [E.2](#) of the University Calendar.

10. **Human studies statement:**

Students will not participate as subjects or researchers in human studies.

11. **Reappraisal of Grades:**

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

1. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **15 days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a re-assessment of the work if, and only if, the student has sufficient academic grounds. See sections [I.1](#) and [I.2](#) of the University Calendar
2. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

12. **OTHER IMPORTANT INFORMATION FOR STUDENTS:**

- a. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/ fabrication of experimental values in a report. **These are only examples.**
- b. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- c. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical

condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accomodations-for-students-with-disabilities_0.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head of Undergraduate Affairs of the Department of Computer Science, Nathaly Verwaal by email nmverwaa@ucalgary.ca or phone 403-220-8485. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question: <http://www.ucalgary.ca/pubs/calendar/current/e-4.html>

- d. **Safewalk:** Campus Security will escort individuals day or night (www.ucalgary.ca/security/safewalk/). Call [403-220-5333](tel:403-220-5333) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- e. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see also www.ucalgary.ca/legalservices/foip.
- f. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: sciencerep@su.ucalgary.ca. Student Ombudsman, Email: suvpaca@ucalgary.ca.
- g. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- h. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.
- i. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see www.ucalgary.ca/wellnesscentre or call [403-210-9355](tel:403-210-9355).

Department Approval:

Electronically Approved

Date: 2018-01-05 15:11

Course Outcomes

1. **Data Collection.** Students should be able to identify and carry out a variety of data collection processes including surveys, using sensors, active and passive logging, and extracting data from existing databases and systems.
2. **Data Cleaning and Integration.** Students should be able to identify common sources of error in real-world data (entry error, mis-calibration, spurious integrity, etc.) and their characteristics. Students should be able to take a dataset and apply de-duplication, outlier detection, type checking, and other data cleaning approaches.
3. **Statistical Analysis.** Students should be able to describe and conduct basic statistical analyses, including: dependence and independence, correlation/causation, conditional probability, confidence intervals, and common statistical distributions.
4. **Statistical Modeling, Classification, and Clustering.** Students should be able to describe and apply basic linear and logistic regression, model-fitting, and clustering techniques.
5. **Exploratory Data Analysis.** Students should be able to conduct exploratory data analysis on real, complex data sets using tools like Tableau and Jupyter.
6. **Presentation.** Students should be able to create visual presentations of their analytic results, including dashboards, graphical reports, presentations, and stories.
7. **Data and Ethics.** Students should be aware of the ethical implications of data collection and analytics. Students should be able to identify problematic data collection and experimentation practices, anonymize datasets, and describe good data security practices.