IS2002B/DS2000B: Introduction to Data Science

Description:

Introduction to basic concepts and tools used to analyze large and complex data sets, enabling scientists to identify relevant information, while being able to quantify the certainty of their conclusions. The class is centered on three basic concepts: sampling as the process of making inferences about a population, random assignment and experiments to be able to draw causal inferences, and choosing adequate models to be able to make good predictions. For each concept, the class introduces a related technique (bootstrap, randomization test, and cross-validation), providing the students with the toolkit to tackle even difficult and non-standard statistical problems. The class is built on the insight that "you only understand it if you can do it". Therefore, the main emphasis of the class is to apply the concepts and techniques in the homework assignments, midterm, and final, all of which are centered on real data analysis problems. Students learn to program in Python, use data analysis toolboxes, and Jupyter Notebooks, equipping them with valuable real-world data-analysis skills.

Class time:

Winter term, 2022:
Lecture: Thursday,

1.0 courses from Mathematics, Calculus, or Applied Mathematics (numbered 1000 and higher) with a minimum mark of 60%. Data Science 1000A/B (with a minimum grade of 60%) can be used to meet 0.5 of the 1.0 mathematics course requirements.

Antirequisite(s): Computer Science 2034A/B, Computer Science 2035A/B.

Course content:

Week starting with	Lecture concepts	Tutorial / Homework
01/13	Intro to class Data Basics (O1.2) Examining numerical data (O1.6) Mean, Median, Mode Standard deviation	HW1

Contingency plan for an in-person class pivoting to 100% online learning
In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online synchronously (i.e., at the times indicated in the timetable) and asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will not change. Any remaining assessments will also be conducted online as determined by the course instructor.

When deemed necessary, tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledging that you will be required to provide personal information (including some biometric data) and that the session will be recorded. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at: https://remoteproctoring.uwo.ca.

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at this website: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

All required homeworks may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (http://www.turnitin.com).

Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at (519) 661-2147 if you have any questions regarding accommodations.

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mentalhealth) for a complete list of options about how to obtain help. Additional student-run support services are offered by the USC, http://westernusc.ca/services.