Data Analysis Systems

ADMS 4370 Sect: A Fall 2024

Course Information

Course Instructor: Yvonne Xu
E-mail: yawenxu@yorku.ca
Office Hours & Location: By Appointment

Course Time & Days: W 19:00-22:00
Class Location: DB 2118 (LAB)
Course eClass site: York U eClass Portal

Land Acknowledgment

York University recognizes that many Indigenous Nations have longstanding relationships with the territories upon which York University campuses are located that precede the establishment of York University. York University acknowledges its presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, and the Huron-Wendat. It is now home to many First Nation, Inuit, and Métis communities. We acknowledge the current treaty holders, the Mississaugas of the Credit First Nation. This territory is subject of the Dish with One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region (LA&PS Land Acknowledgement).

Course Overview

Course Description

Introduces Windows-based data processing software and provides an overview of computing concepts and data processing using R. Covers such statistics techniques as data visualization and summary, analysis of contingency tables, linear and logistic regressions, and nonparametric methods. Elective course for: BAS ITEC and BAS HURE. Prerequisite: AP/ADMS 2320 3.00 or AP/ECON 2500 3.00 or MATH 2131 3.00.

Course Format and Organization

- In-person Lectures.
- Course announcements, Assignments, and Lecture Materials are posted via eClass,
- Class discussion forum is created on eClass. Students are encouraged to communicate and discuss course-relevant questions and topics on forums.

Technical Requirements

- Please ensure your eClass account is active and accessible.
- Please ensure you have access to AppsAnywhere and are able to run SAS https://myapps.yorku.ca/.

Here are some useful links for student computing information, resources, and help:

- Student Guide to eClass
- Student Guide to eLearning at York University

To determine Internet connection and speed, there are online tests, such as Speedtest, that can be run. If you need technical assistance, please consult the University Information Technology (UIT) Student Services web page. For more specific assistance, please write to askit@yorku.ca.

Course Evaluation

Assessment	Due Date	Weight %
Lab Exercise 1	Sept. 18	5%
Quiz 1	Oct. 2	10%
Mid-term	Oct. 23	25%
Lab Exercise 2	Nov. 13	5%
Quiz 2	Nov. 20	10%
Final Project Presentation	Nov. 27	20%
Final Project Report	Dec. 4	25%
		100%

Submitting Assignments

- All submissions are through eClass.
- Test coverage will be announced during the lecture 1 week prior to the test.

Late Work Policy

- Late Lab Exercises and Final Project are NOT acceptable.

Missed Tests and Exams

- NO make-up quizzes, mid-term exam and Final Presentation.

YORK U

Grading

The grading scheme for this course conforms to the 9-point system used in undergraduate programs at York University. For a full description of the York grading system, visit the York University Academic Calendar.

GRADE	GRADE POINT	PERCENT RANGE	DESCRIPTION
A+	9	90-100	Exceptional
A	8	80-89	Excellent
B+	7	75-79	Very Good
B	6	70-74	Good
C+	5	65-69	Competent
C	4	60-64	Fairly Competent
D+	3	55-59	Passing
D	2	50-54	Marginally Passing
E	1	(marginally below 50%)	Marginally Failing
F	0	(below 50%)	Failing

How to Use Citations

- SPARK Student Papers & Academic Research Kit
- Drop-in Research Support, YorkU Libraries
- Writing Centre
- ESL Open Learning Centre

Cited according to the following referencing styles:
   - APA
   - MLA
   - Chicago

Course Schedule: Weekly Readings and Activities

Required Course Materials

- No Required Textbooks.

YORK U

Optional Materials

1. *Statistics*, Robert Pisani, David Freedman and Roger Purves, the 4th edition.
2. *Linear Statistical Models an Applied Approach*, L. Bowerman and Richard T. O'connel, 2nd Edition
3. *Applied Logistic Regression*, David W. Hosmer and Stanley Lemeshow, the 2nd Edition
4. *Categorical and Nonparametric* Data Analysis Choosing the Best Statistical Technique, E.Michael Nussbau, the 2nd Edition, 2024
5. *Statistics for Management and Economics*, Keller, G.
6. *Tree-Based Methods for Statistical Learning in R*, Brandon M. Greenwell, 2022
7. UCLA Learning Module R: https://stats.oarc.ucla.edu/r/modules/
8. R programming:
   - R: https://cloud.r-project.org/
   - RStudio: https://rstudio.com/products/rstudio/

Course Schedule

Dates	Readings and Activities	Assessment Due Dates	Unit Learning Outcomes
Week 1 Sept. 4	1. Introduction to Statistics & Statistical Software; R and RStudio installation		
Week 2 Sept. 11	2. Exploratory Data Analysis (EDA) Role of variables, predictors, and outcomes; Graphical and quantitative techniques, univariate and Multivariate; Correlations;		Lab Exercise 1
Week 3 Sept. 18	3. Probability Normal Approximation and Binomial distribution, Sampling Distribution and the Central Limit Theorem	Lab Exercise 1 Due	
Week 4 Sept. 25	4. Hypothesis Testing and Inference (I) Population means, Difference of two population means, t-test, Population Variance / Standard Deviation, P-value, Confidence Interval		
Week 5 Oct. 2	Linear regression Simple linear regression, Assumptions, Least-square estimation, Maximum-likelihood estimation, correlation coefficient		Quiz 1
Week 6 Oct. 9	Linear regression (II) Multiple linear regression, Residual plots, Variable selection, Outliers and Influential Points		

YORK U

Dates	Readings and Activities	Assessment Due Dates	Unit Learning Outcomes
Week 7 Oct. 23	Review and Mid-term		Mid-term
Week 8 Oct. 30	Categorical Data Analysis Relationships between two categorical variables, Chi-square test for Homogeneity and independence.		
Week 9 Nov. 6	Binary logistic regression (I) Significance of the coefficients, confidence interval; Goodness of fit, ROC curve;		Lab Exercise 2
Week 10 Nov. 13	Non-parametric Statistics Mann-Whitney-Wilcoxon test, Spearman rank correlation, Wilcoxon paired samples difference test.	Lab Exercise 2 Due	
Week 11 Nov. 20	Decision Tree (Optional)		Quiz 2
Week 12 Nov. 27	Review and Final Project Presentation		Presentation

Course Policies

All students are expected to familiarize themselves with the following information:
- Student Rights & Responsibilities
- Academic Accommodation for Students with Disabilities

Please also review the following course policies:

Academic Integrity

As a student at York University, you have a responsibility to both understand and uphold the integrity of the academic experience. The Faculty of Liberal Arts & Professional Studies supports the International Center for Academic Integrity's definition of academic integrity. That is, you will be committed to acting in all academic matters, even in the face of adversity, with honesty, trust, fairness, courage, respect and responsibility. Here is how you can demonstrate academic integrity in the completion of this course:

- **Respect the ideas of others**: Your course work should represent your own knowledge and ideas. You should not falsely claim credit for ideas that are not

YORK U

your own, by presenting another's work as yours. If you are quoting, paraphrasing, or summarizing another person's work in order to support your own ideas, identify the work and the author through proper citation practices. For more information about how to cite properly, use the Student Papers and Academic Research Kit (SPARK). You can improve your writing, research, and personal learning abilities through the Learning Commons, or by visiting the Writing Centre or ESL Open Learning Centre.

- **Respect your peers**: Know when you are allowed to collaborate. Ask your instructor about what group work entails when it comes to the sharing of work. In test situations and assignments, don't steal or give answers to your peers, whether in-person or online (e.g., in group chats and/or on third-party content-sharing websites, such as Chegg, Course Hero, etc.). Both cheating and aiding in a breach of academic honesty are violations of York University's academic honesty policy.
- **Respect your course instructor(s)**: Understand what your instructors are asking of you in class, as well as on assignments, tests and/or exams. If you are unsure, ask your professor or teaching assistant. They are committed to making you feel supported and want to assess you fairly and with integrity. Please do not submit the same piece of work for more than one course without your instructor's permission. That can be considered an act of cheating.
- **Respect yourself**: When you act with integrity, you know that your work is yours and yours alone. You do not allow others to take tests for you. You do not buy or otherwise obtain term papers or assignments. You do the work. As a result, you know that you *earned* the grades that you receive, so you can be proud of your York degree. By acting with integrity in your course work, you are also practising a valuable professional skill that is important in all workplaces.
- **Take responsibility**: If you have acted in an academically dishonest way, you can demonstrate courage and take responsibility for your mistake. You can admit your mistake to your course instructor as soon as possible.

Students who engage in academic dishonesty can be subject to disciplinary action under the *Senate Policy on Academic Honesty*. Your lack of familiarity with the Senate Policy does not constitute a defense against its application. Some academic offences can also constitute offences under the Criminal Code of Canada, which means that you may also be subject to criminal charges.

Accessibility
While all individuals are expected to satisfy the requirements of their program of study and to aspire to achieve excellence, the University recognizes that persons with disabilities may require reasonable accommodation to enable them to perform at their best. The University encourages students with disabilities to register with Student

YORK U

Accessibility Services to discuss their accommodation needs as early as possible in the term to establish the recommended academic accommodations that will be communicated to Course Directors through their Letter of Accommodation (LOA).

Please let your instructor know as early as possible in the term if you anticipate requiring academic accommodation so that we can discuss how to consider your accommodation needs within the context of this course. Sufficient notice is needed so that reasonable steps for accommodation can be discussed. Accommodations for tests/exams normally require three (3) weeks (or 21 days) before the scheduled test/exam to arrange.

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making reasonable and appropriate accommodations to adherents for observances of special significance. Should any of the dates specified in this syllabus for course examinations, tests, or deadlines conflict with a date of religious significance, please contact the instructor within the first three (3) weeks of class. If the date falls within the formal examination periods, you must complete and submit a Religious Accommodation for Examination Form at least three (3) weeks before the start of the exam period.

Intellectual Property

Course materials are designed for use as part of this particular course at York University and are the intellectual property of the instructor unless otherwise stated. Third-party copyrighted materials (such as book chapters, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian copyright law. Students may not publish, post on an Internet site, sell, or otherwise distribute any course materials or work without the instructor's express permission. Course materials should only be used by students enrolled in this course.

Copying this material for distribution (e.g., uploading material to a commercial third-party website) may lead to a charge of misconduct according to York's *Code of Student Rights and Responsibilities*, the *Senate Policy on Academic Honesty*, and/or legal consequences for copyright violations.

Student Conduct in the Learning Environment

York University is committed to fostering teaching and learning environments that are free of disruptive and/or harassing behaviour, are physically safe, and conducive to effective teaching and learning. Students and instructors are expected to maintain a

YORK U

professional relationship characterized by courtesy, civility, and mutual respect and to refrain from actions disruptive to such a relationship. Individuals who fail to adhere to such standards and who violate University or public law may be subject to disciplinary action by the University.

For more information, see the policies on Disruptive and/or Harassing Behaviour in Academic Situations and Student Conduct and Responsibilities, as well as the *Code of Student Rights & Responsibilities*.

Netiquette for eClass and Online Learning

Students and instructors have a joint responsibility to create and maintain a welcoming and inclusive learning environment. All students are expected to conduct themselves in accordance with the *Code of Student Rights and Responsibilities*. Please review and familiarize yourself with behaviours that support "netiquette" in virtual classrooms by consulting the Student Guide to eLearning.

Student Notice of Recording for Online Teaching and Learning

Activities for this course involve recording, in partial fulfillment of the course learning outcomes. Images, audio, text/chat messaging that have been recorded may be used and/or made available by the University to students enrolled in the course and those supporting the course for the purpose of materials review, for assessment, etc. Recordings will be managed according to the University's Common Record Schedule and will be securely destroyed when no longer needed by the University. Your personal information is protected in accordance with York University's *Guidelines on Access to Student Records and Protection of Privacy* and the *Freedom of Information and Protection of Privacy Act*. Access to online materials, including recordings or live meetings, is subject to York University's *Senate Policy on Computing and Information Technology Facilities*.

The University will use reasonable means to protect the security and confidentiality of the recorded information, but cannot provide a guarantee of such due to factors beyond the University's control, such as recordings being forwarded, copied, intercepted, circulated, disclosed, or stored without the University's knowledge or permission, or the introduction of malware into computer system which could potentially damage or disrupt the computer, networks, and security settings. The University is not responsible for connectivity/technical difficulties or loss of data associated with your hardware, software, or Internet connection.

By engaging in course activities that involve recording, you are consenting to the use of your appearance, image, text/chat messaging, and voice and/or likeness in the manner and under the conditions specified herein. In the case of a live stream recording, if you

YORK U

choose not to have your image or audio recorded, you may disable the audio and video functionality. If you choose to participate using a pseudonym instead of your real name, you must disclose the pseudonym to your instructor in advance to facilitate class participation.

You are not permitted to disclose the link to/URL of an event or an event session recording or copies of recording to anyone, for any reason. Recordings are available only to authorized individuals who have been directly provided the above instructions/link for their use. Recordings for personal use, required to facilitate your learning and preparation of personal course/lecture notes, may not be shared with others without the permission of the instructor or event coordinator, and may not be published, posted, linked to, or otherwise made available online, including on social media feeds, even if those feeds are private.

As always, if you have any questions about the collection or use of your personal information, please contact your instructor or the Privacy Office at info.privacy@yorku.ca.

Student Support and Resources

To help you succeed academically, York University offers a wide range of resources and services. Everything from writing workshops and peer mentorship to wellness support and career guidance is available to fulfill our LA&PS students' needs. Explore the links below to access these on-campus resources:

- Academic Advising is available to provide students support and guidance in making academic decisions and goals.
- Student Accessibility Services are available for support and accessibility accommodation when required.
- Student Counselling, Health & Wellbeing offers workshops, resources, and counselling to support your academic success.
- Peer-Assisted Study Sessions (PASS) Program provides student study sessions for students to collaborate and enhance their understanding of course content in certain courses.
- Student Numeracy Assistance Centre at Keele (SNACK) supports students in courses involving math, stats, and Excel.
- The Writing Centre provides multiple avenues of writing-based support including drop-in sessions, one-to-one appointments, a Multilingual Studio, and an Accessibility Specialist.
- ESL Open Learning Centre (OLC) supports students with building proficiency in reading, writing, and speaking English.

YORK U

- Learning Skills Services provides tips for time management, effective study and learning habits, keeping up with coursework, and other learning-related supports.
- Learning Commons provides links to supports for time management, writing, study skills, preparing for exams, and other learning-related resources.
- Roadmap to Student Success provides students with timely and targeted resources to help them achieve academic, personal, and professional success.
- Office of Student Community Relations (OSCR) is responsible for administering the *Code of Student Rights & Responsibilities* and provides critical incident support.
- goSAFE is staffed by York students and can accompany York community members to and from any on-campus location, such as the Village Shuttle pick-up hub, parking lots, bus stops, or residences.

For a full list of academic, wellness, and campus resources visit Student Support & Resources.

YORK U