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Course Outline

DANA 4810 SECTION 001
PREDICTIVE ANALYTICS – QUANTITATIVE DATA
SPRING 2026 COURSE OUTLINE

Instructor: Azadeh Alimadad **E-mail:** aalimadad@langara.ca

Office: B154j **Phone Number:** 604-323-5511, ext. 2166

Class: Mon and Wed: 2:30 pm - 4:20 pm at Classroom B027

Office Hours: Check my weekly schedule at D2L

by appointment:

Course Basic Information

Credits: 3.0

Course Format: In person 4.0h

Course Description: Predictive Analytics is a process of using and applying statistical analysis techniques for estimation and forecasting. Students learn standard methodology for analyzing quantitative data, including analysis of variance, design of experiments, simple regression, multiple regression, data transformation, and generalized linear models.

Prerequisite: A passing mark from Data Analytics Math Assessment Test or a passing grade in MATH 4801 and a minimum "C" grade in DANA 4800.

Transfer Credits: Course credits are valid only for Langara College's Data Analytics Post-Degree Diploma.

Learning Outcomes

Upon completion of this course, successful students will be able to:

- conduct one-way and two-way ANOVA and interpret the result, and check the underlying requirement
- select appropriate design of experiment for data analysis
- use the techniques of correlation, simple linear regression and multiple regression, and check the underlying assumptions of these methods
- select and conduct the appropriate data transformation techniques for dealing with non-normal response variables
- use the generalized linear model technique to develop statistical models when the response variable is not normally distributed and as a generalized approach to linear regression.
- identify and apply the basic procedures of hypothesis tests and confidence intervals
- use industry-leading statistical software applications to perform data analysis and to interpret the output.

Required Textbook

The following textbook is required for this course:

- Mendenhall, William and Sincich, Terry. 2012. *A Second Course in Statistics: Regression Analysis*, 7th edition. Boston MA: Pearson Education.
- Irizarry, R.A. 2019. Introduction to Data Science: Data Analysis and Prediction Algorithms with R.

Online References Reading:

- Learn R: https://www.learn-r.org/
- Official R-studio: https://education.rstudio.com/learn/

Requirements:

Hardware:
Students need to bring their own laptop (Windows, Mac or Linux) to every lab with at least 8GB of RAM (16GB recommended), an Intel Core i5 or equivalent and at least 35GB of storage space.
Software:
Installation tutorial will be provided in class.

Evaluation

	Percentages	Dates
Final Examination	30%	April 9 - 21
Midterms (2)	30%	Feb 11, March 28
Term Project	25%	April 1-8
Assignments/Participation	15%	In-class/Take home

College Policies

E1003 - Student Code of Conduct
F1004 - Code of Academic Conduct
E2008 - Academic Standing - Academic Probation and Academic Suspension
E2006 - Appeal of Final Grade
F1002 - Concerns about Instruction
E2011 - Withdrawal from Courses
F1008 - Student Attendance and Participation

Important Notes

1. The final examination will be a three-hour exam on the entire semester's work.

2. The final examination period for this term is **April 9-21 2026.** Seating at the final exam is mandatory. Hence, students should make themselves available during this time.

3. The following grading scale is used in this course:

Minimum Overall (%)	96	85	80	77	73	68	63	58	53	48
Grade in Course	A+	A	A-	B+	B	B-	C+	C	C-	D

To pass the course, a student must achieve at least 45% on the final exam.

PLEASE NOTE, some students will be selected randomly at the end of the exams to explain or justify their answers or answer similar questions to proof their own understanding. Any discrepancy in this regard can affect the student's grade.

4. The last day of withdrawal for a 70% tuition fee refund **Jan 11, 2026.**

5. The **Mathematics/Statistics Activity Centre** or **MSAC** (in B154): a place for students to get help from peer tutors (former students) or faculty members on a one-on-one basis. More information (including the opening hours) can be found from the following link.
http://www.langara.bc.ca/student-services/learning-commons/tutoring/math-stats.html

6. **No make-up test will be given.** If you miss a test because of personal or medical reasons, please contact your instructor via email (aalimadad@langara.ca) as soon as possible. Any discussion regarding missing tests should be in person during the office hours as the earliest opportunity.

7. There is a course policy that students who hand in a low-quality project completed with minimal effort will not get a final letter grade higher than a D. The project is an important component of this course.

8. The final examination is cumulative, testing you on all topics covered throughout the term. The midterm tests are not intended to be cumulative, although you are expected to know the fundamentals of topics covered earlier since statistical understanding later in the course is built on concepts acquired earlier.

9. Students are allowed to bring their own handwritten formulas/notes for midterm/final exams. Two sheets (8-1/2" x 11", written on both sides) is allowed for the 1st midterm, three sheets for the 2nd midterm, and three sheets for the final exam.

10. Students will use R for data analysis in this course.

11. **Attendance**: Attendance is essential for success in this course. Students are expected to attend the full duration of all regularly scheduled classes. Absence for any cause in no way relieves you from your responsibility to complete the course work to the satisfaction of your instructor. (Please read the Class rules on D2L)

12. **Assignments:** Assignments/Activities are designed to help you master the concepts presented in class and gain experience in data analysis and interpretation. Students are encouraged to work together and discuss their ideas, but you will likely find that you will learn the material most thoroughly by first attempting to work out the solutions yourself. For individual assignments, each student is expected to submit his or her own written solutions. For group activities one submission is enough. (Please read the Class rules on D2L)

13. **Office hour:** I will be available at my office B154j. (Please check my weekly schedule on D2L)

Tentative Course Schedule:

Topic	Section Number
1. Inference about Two Population Means	Mendenhall Chapter 1
2. Simple Linear Regression	Mendenhall Chapter 2&3
3. Multiple regression models	Mendenhall Chapter 4
4. Principles of Model Building	Mendenhall Chapter 5
5. Variable Selection Methods	Mendenhall Chapter 6
6. Multicollinearity, extrapolation and variable transformations	Mendenhall Chapter 7
7. Residual Analysis	Mendenhall Chapter 8
8. Principles of Experimental Design	Mendenhall Chapter 11
9. Analysis of Variance	Mendenhall Chapter 12

*Mendenhall refers to the **7th edition** of the textbook A Second Course in Statistics Regression Analysis.