DALHOUSIE UNIVERSITY

Faculty of Science Course Syllabus
Department of Mathematics & Statistics
Stat 2450
Introduction to Data Mining with R
Winter, 2020

Instructor(s):	Philippe Fullsack
	Email:Philippe.Fullsack@dal.ca
	Office: Chase Building, room # 353
Lectures:	When : Monday + Wednesday 2:35pm-3:55pm
	Where: LSC-PSYCHOLOGY P5260

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Course Description: *This course provides an introduction to data mining and R programming, suited for science students. Data mining methods include a vast set of tools developed in different areas for identifying the patterns in data. Students will learn programming methods for manipulating and exploring data through learning the basic ideas of some clustering, regression and classification methods. No prior programming knowledge is assumed.*

Course Prerequisites: MATH 1000.03 or MATH 1215.03 and either (STAT 1060.03 or MATH 1060.03) or (STAT 2060.03 or MATH 2060.03) or DISP

Course Materials
- Required text: Textbook: "Introduction to Statistical Learning with Applications in R" by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani, published by Springer (Hard copy in bookstore, or available free online at: https://www-bcf.usc.edu/~gareth/ISL/index.html

- Lecture notes, assignments, etc., are at: https://mathstat.dal.ca/~fullsack/stat2450

- Assignments will require use of the statistical software package R, together with the program RStudio, and the Rmarkdown library.
 Directions for installing the software are at: https://mathstat.dal.ca/~fullsack/stat2450/Notes/Rintro.html

Course Assessment

Component	Weight (% of final grade)	Date
Midterm exam	20%	February 10, 6:00-8:00 PM, D420, McCain Building

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Final exam	40%	(Scheduled by Registrar)
Assignments	*8* assignments, each worth 5%, roughly every two weeks.	

Conversion of numerical grades to Final Letter Grades follows the <u>Dalhousie Common Grade Scale</u>

A+ (90-100)	**B+** (77-79)	**C+** (65-69)	**D**	(50-54)
A (85-89)	**B** (73-76)	**C** (60-64)	**F**	(<50)
A- (80-84)	**B-** (70-72)	**C-** (55-59)		

Course Policies

Assignments are to be submitted at the beginning of class on the due date.
Late assignments will not be accepted.
It is expected that each student will write up their assignment independently. Students submitting identical assignments will receive a mark of 0 for that assignment.
If you are ill on the day of a test, you must advise me of this fact before the test, and you will need to submit a Student Declaration of Absence form before you can write a make-up test.

Course Objectives/Learning Outcomes

The broad goals of this course are twofold:

Firstly, to teach students R programming and some general scientific computing methods. Roughly the first half of course will be allocated to R programming, including: using R as a calculator, data types, data structures, external files, loops and flow control, conditional execution, user defined functions, and use of built in statistical/graphical functions.

Secondly, to introduce a number of concepts for statistical learning, including: multiple regression, CART, and clustering, supervised vs unsupervised learning, the bias variance trade-off, performance evaluation, cross validation, and bootstrapping.

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

Statement: http://www.dal.ca/cultureofrespect.html

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

https://www.dal.ca/academics/important_dates.html

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Missed or Late Academic Requirements due to Student Absence (policy)

https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html

Student Resources and Support

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: https://www.dal.ca/faculty/science/current-students/academic-advising.html

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: https://libraries.dal.ca/

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office: https://libraries.dal.ca/services/copyright-office.html

Fair Dealing Guidelines https://libraries.dal.ca/services/copyright-office/fair-dealing.html

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html

Student Advocacy: https://dsu.ca/dsas

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

Biosafety: https://www.dal.ca/dept/safety/programs-services/biosafety.html

Chemical Safety: https://www.dal.ca/dept/safety/programs-services/chemical-safety.html

Radiation Safety: https://www.dal.ca/dept/safety/programs-services/radiation-safety.html

Scent-Free Program: https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html