STAT 1001 Introduction to Data Science with R
Winter 2023

Instructor(s):	**Nanwei Wang**	**Class Day(s):**	**Thursday**
Email:	**nwang3@unb.ca**	**Time:**	**08:30 AM- 09:20 AM**
Phone:	**5064534768**	**Class Location:**	**TO 303**
Office Location:	**Tilley Hall 408**	**Office Hours:**	**Th 3:00 PM-4:20 PM**

About the Course

Course Description:
This course deliveries basic data science techniques in R including importing and exporting data, data transformation, visualization, modelling, and utilization of existing libraries. Students will learn basic R programming skills, functions, and libraries. Understanding basic data science project management skills and getting familiar with online data science communities and resources are the two major learning outcomes.

Course Prerequisites:
MATH 1003

Textbook(s):
Wickham, Hadley, and Garrett Grolemund. R for data science: import, tidy, transform, visualize, and model data. " O'Reilly Media, Inc.", 2017. — 1st Edition

Expected Student Learning Outcomes:

Students are expected to know some basic data science techniques including:

1. Set up virtual environment with conda to build their own working environment to do data science projects.
2. Basic R skills to manipulate data sets.
3. Data visualization with library such as ggplot2, matplotlib.
4. Understand different format of data sets and different types of variables and how different variables are correlated.
5. Start using version control system like github to keep track of their codes.
6. Teamwork skills, presentation skills. Learn to use R markdown to write project report.
7. Get familiar to some data science communities such as Github, stack exchange, R-bloggers, datacamp and Kaggle.

Tentative Course Outline

Chapter 1 Introduction to R (Python)

1.1 Install R (Python) under different operation system, set up virtual environment, build new project.

1.2 Basic R coding: create new variables, functions, Loops and conditions

1.3 Install and use some packages for data science projects

Chapter 2 Introduction to variables, data sets

2.1 import and export data, combine or split data based on some conditions

2.2. understand different types of variables: continuous, categorical, strings, factor, Dates and times

2.3 data visualization with ggplot

Chapter 3 Simple linear regression models

3.1 Introduction to linear regression

3.2 Build linear regressions and understand the summary output

3.3 Model selection with multiple covariates

3.4 Model evaluation based on training and testing data

Chapter 4 Introduction to version control system and shell-based scripting

4.1 Introduction to Github

4.2 Programming on Linux system servers

Chapter 5 Communicate

5.1 Use R Markdown to create reports

5.2 Data science project presentation skills

5.3 Data science communities

Methods of Assessing the Expected Learning Outcomes:
This course is a statistical lab course, student will not take written exams. Homework will be assigned to check the learning outcomes. A midterm project and a final project will be used to evaluate students' performance. In terms of the projects, students will be asked to use R to analyze real data, answer some questions and write a report.
Attendance: Students' competency levels on these outcomes may vary. Outcomes achievement requires the meeting of all course expectations, including honouring of all course policies, regular class attendance, and completion of all assigned work in good faith and on time.

Grading, Marks, and Course Policies

Grading Scale

Final Grade	Letter Grade	Grade Points
97-100	A+	4.3
93-96	A	4.0 (Excellent)
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3.0 (Good)
80-82	B-	2.7
77-79	C+	2.3
70-76	C	2.0 (Satisfactory)
65-69	D	1.0
Below 65	F	0.0

Course Marking Scheme

Item	Value	Due Date
Assignments	30%	
Midterm Project	30%	
Final Project	40%	
Total	**100%**	

Course Policies:

1. Expectations for participation and attendance (note the UNB attendance policy: http://go.unb.ca/tls1viWva)
2. Deadlines for assignment submissions
3. Submission methods: electronically

Class Recording and Copyright

Anyone who wishes to video or audio record lecture presentations or distribute course notes or other similar materials provided by instructors must obtain the instructor's written consent beforehand. Otherwise all such reproduction is an infringement of copyright and is absolutely prohibited and subject to academic penalties (see Academic Offences below). In the case of private use by students with documented disabilities, the instructor's consent will not be unreasonably withheld.

Privacy Statement for Online Course Recordings

- The recordings of your online classes are for your personal use for course purposes only and not to be shared with others.

- Be respectful of your peers and instructors. Sharing of any personal information, including but not limited to personal views and opinions with others, other than for course purposes, is not permitted and may violate UNB's Policy for the Protection of Personal Information and Privacy.

- Personal opinions, views, and commentary provided in the course of online delivery may be considered personal information, which requires the consent of the person who provided it in order to share it ethically and legally. Course videos are to be used only to help you learn the course material.

- The content shared by faculty and instructors is subject to copyright and cannot be shared without the explicit permission of the copyright owner, which may include but not be limited to the course instructor, their colleagues, textbook publishers, and multimedia vendors.

Plagiarism and Academic Offences

"The purpose of education is to acquire knowledge, develop skills, and to grow as an individual. In order to achieve these goals one needs to approach one's courses in an honest manner. This requires individuals to submit work that is their own creation. Students often wonder why documenting their sources and maintaining a high level of academic integrity is so important, and why failure to do so is taken so seriously. Work undertaken at university is part of a centuries-long conversation. All work builds on that of your predecessors. Documenting your sources recognizes the efforts of others and places your contribution within the conversation. Therefore, your documentation/integrity shows courtesy for your sources and for your reader."

Ken Craft

The university has carefully defined what it considers plagiarism, and these regulations are found in the UNB calendar section B.19 IX Academic Offences:

Plagiarism includes:

1. quoting verbatim or almost verbatim from any source, regardless of format, without acknowledgement;
2. adopting someone else's line of thought, argument, arrangement, or supporting evidence (such as, statistics, bibliographies, etc.) without indicating such dependence;
3. submitting someone else's work, in whatever form (essay, film, workbook, artwork, computer materials, etc.) without acknowledgement;

4. knowingly representing as one's own work any idea of another.

NOTE: In courses which include group work, a penalty may be imposed on all members of the group unless an act of plagiarism is identified clearly with an individual student or students.

Please note that plagiarism is not difficult to spot; web sources can be quickly traced through a variety of specialty search engines. Professors are required to follow the disciplinary procedures outlined in the calendar (B.17. IX. A. 1-2).

OTHER ACADEMIC OFFENCES you need to be aware of include:

1. Cheating on examination, tests, assignments or reports, including but not limited to:
   Impersonating a candidate at an examination or test or in connection with any assignment in a course or availing oneself of the results of impersonation.
   Obtaining, through theft, bribery, collusion, purchase, or other improper manner,
   1. an examination or test paper prior to the date and time for writing the examination or test;
   2. academic materials belonging to another person, e.g. laboratory reports, assignments, papers, computer materials, datasets.
2. Falsifying or knowingly submitting false assignments or credentials, records, transcripts, or other academic documents.
3. Submitting a false health or other certificate.
4. Submitting identical or substantially similar work for one course or program of study, which has been or is being submitted for another course or program of study, without the prior express knowledge and approval of the instructors.
5. Interfering with the right of other students to pursue their studies.
6. Knowingly aiding or abetting any of the above offences.
7. Tampering with, or altering, in any deceptive way, work subsequently presented for a review of the grade awarded.

Penalties for plagiarism and other academic offences range from a minimum of F (zero) in the assignment, exam or test to a maximum of suspension or expulsion from the University, plus a notation of the academic offence on the student's transcript.

For more information, please see the Undergraduate Calendar, University Wide Academic Regulations, Regulation VIII.A, or visit: http://go.unb.ca/tlsPb0XX5 . It is the student's responsibility to know the regulations.

Weekly Schedule

The intended schedule is found below. It is subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better student learning. Students will be notified if and when changes are made.

Day/Date	Topics	In-Class Activity	Assignments
01/12 Th	Chapter 1.1, 1.2		
01/19 Th	Chapter 1.3		
01/26 Th	Chapter 2.1		
02/02 Th	Chapter 2.2, 2.3		
02/09 Th	Chapter 3.1,3.2		
02/16 Th	Chapter 3.3		
02/23 Th	Chapter 3.4		
03/09 Th	**Reading week**		
03/16 Th	**Midterm project presentation**		
03/23 Th	Chapter 4.1, 4.2		
03/30 Th	Chapter 5.1		
04/06 Th	Chapter 5.2, 5.3		
04/13 Th	**Final project**		
04/15 Th	**Final project deadline**		

Student Services Writing and Study Skills Support
The UNB Writing and Study Skills Centre provides many coaching and mentoring services to assist with writing papers, effective study methods, and other skills development related to student success: http://www.unb.ca/fredericton/studentservices/academics/writing-centre/index.html

Student Services Learning Strategist Support
Any UNB student wanting to improve their academic skills may book appointments with the Learning Strategist. The Strategist offers instruction on topics such as: "learning how to learn" strategies, memory techniques, time management skills, test preparation and test taking methods, note-taking, and other learning and study skills.
https://www.unb.ca/fredericton/studentservices/academics/accessibility/learning-strategies.html

Math Skills Support
UNB's Math Learning Centre offers math help drop-in times and opportunity to book appointments: http://www.math.unb.ca/~mathhelp/

Technical Support

Information Technology Services (ITS) Help Desk can be reached by phone 457-2222 (Fredericton Campus) 657-2222 (Saint John Campus), email - itservicedesk@unb.ca, or visited in person at the Harriet Irving Library Learning Commons. http://www.unb.ca/its/get-it-help.html