

CGSC5101/HCIN5400 Experimental Methods & Statistics

Fall 2023, v1.0

Instructor

John Logan / john.logan@carleton.ca Put CGSC 5101 or HCIN 5400 in the subject line. Phone: 613-520-2600, x2690. (Email is my preferred method of contact.)

Office hours: Tuesday 2:30 - 3:30 PM DT 2215

Class time & location

1:05 - 2:25 PM, Tuesdays & Thursdays; Tory 431

CGSC5101/HCIN5400 is an in-person course. This means that you are expected attend classes on campus.

Prerequisites

The prerequisites for CGSC 5101/HCIN 5400 are graduate status in the Cognitive Science or Human Computer Interaction programs.

Calendar Description

An introduction to the design of experiments and the statistics needed to interpret data.

Course Objectives

CGSC 5101/HCIN 5400 covers the basics of experimental design and data analysis. It will cover descriptive statistics and the inferential statistics required for deciding if results obtained in a study can be generalized to a population or if the results are due to chance or not. You will learn how to use these statistics as well as learn their underlying conceptual basis. You also will learn how to use the the statistical software R.

The classes will consist of short lectures interspersed with collaborative hands-on activities and analyses using R. If you have a laptop, you are strongly encouraged to bring it to class. Anyone wishing to audit the course should speak to the instructor. Everyone is expected to attend all of the classes, unless there is a documented reason not to do so.

Skills required

This course is designed for beginners. Advanced mathematical skills are not required to successfully complete CGSC 5101/HCIN 5400. You need to know how to add, subtract, multiply, divide, take square roots, plus the order in which mathematical operations are done in a formula.

Required Material

1. Textbook: Navarro, D. (2015). Learning statistics with R: A tutorial for psychology students and other beginners. <https://learningstatisticswithr.com/book/> This is an online, free textbook that covers the major topics of an introductory statistics course; it is what I will use to present background about statistical theory and statistical tests. We will use additional free online resources to aid learning R.
2. R, a free, open-source statistical package
3. R Studio, free software that makes R much easier to use

Class Internet Site

The website for CGSC 5101/HCIN 5400 is located on Brightspace. The class Brightspace site contains outlines of lectures plus it is where you will download and upload assignments.

How You Will Be Evaluated

Your final grade will be based on 5 assignments.

Item	Weight of grade	Due date
Assignment 1	15	September 30
Assignment 2	20	October 14
Assignment 3	20	November 4
Assignment 4	20	November 18
Assignment 5	25	December 9

Each assignment will provide a brief description of a data set and questions to be answered about the data set. You will be required to hand in a report in **APA style** of your results, resembling the type of description you would see in a journal paper (but possibly with more detail if required by the assignment specification). Assignments must be submitted through Brightspace. More specific detail about each assignment will be provided in class and on Brightspace

The final project will be a more extensive version of an assignment. The final project write up should be between 7-15 double spaced pages.

All assignments and the final project are expected to be submitted on time and late submissions will not be graded (resulting in a mark of 0). However, there is a one-time "late pass" that can be used once to submit an assignment up to three days late. This late-pass does not apply to the final project, which must be submitted on time. If you intend to use the pass, you must mail the instructor before the due date to let them know.

Ideally, you will attend all classes and participation in classroom discussion is strongly encouraged.

Students seeking an academic accommodation for course work will not be required to produce a doctor's note or medical certificate. Instead, students should use the Medical Self-Declaration form at <https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf>.

E-mail Protocol

I will respond to e-mails within 48 hours (excluding weekends and holidays). E-mail is best reserved for simple questions - if you have questions that require more than a yes-/no-type answer, the best forum for answering them is during class or office hours.

Academic Integrity

Carleton University expects all students to be aware of and follow its policy on academic integrity. See <https://carleton.ca/registrar/academic-integrity/> for detailed information about academic integrity. As applied to CGSC5101/HCIN5400, the primary issue that you must be aware of is that any submitted work must be completed by you as a student in the class. More information on academic integrity as applied to class assignments will be provided when the first assignment is provided.

Important Regulations and Information You Should Know About

Statement on Student Mental Health

As a University student you may experience a range of mental health challenges that significantly impact your academic success and overall well-being. If you need help, please speak to someone. There are numerous resources available both on- and off-campus to support you. Here is a list that may be helpful:

- Emergency Resources (on and off campus): <https://carleton.ca/health/emergencies-and-crisis/emergency-numbers/>

Carleton Resources:

- Mental Health and Wellbeing: <https://carleton.ca/wellness/>
- Health & Counselling Services: <https://carleton.ca/health/>
- Paul Menton Centre: <https://carleton.ca/pmc/>
- Equity & Inclusivity Communities: <https://carleton.ca/equity/>

Off Campus Resources:

- Distress Centre of Ottawa and Region: (613) 238-3311 or TEXT: 343-306-5550, <https://www.dcottawa.on.ca/>
- Mental Health Crisis Service: (613) 722-6914, 1-866-996-0991, <http://www.crisisline.ca/>
- Empower Me: 1-844-741-6389, <https://students.carleton.ca/services/empower-me-counselling-services/>
- Good2Talk: 1-866-925-5454, <https://good2talk.ca/>
- The Walk-In Counselling Clinic: <https://walkincounselling.com>

REQUESTS FOR ACADEMIC ACCOMMODATION

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

- Pregnancy: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the Student Guide
- Religious obligation: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the Student Guide

- Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).
- Survivors of Sexual Violence: As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and its survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support

Accommodation for Student Activities: Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist.

PETITIONS TO DEFER

Students unable to write a final examination because of illness or other circumstances beyond their control may apply within **three working days** to the Registrar's Office for permission to write a deferred examination. The request must be fully supported by the appropriate documentation. Only deferral petitions submitted to the Registrar's Office will be considered. See Undergraduate Calendar, Article 4.3.

ACADEMIC FREEDOM

As stated in the Collective Agreement between Carleton University and Carleton University Academic Staff Association (Article 4), "The common good of society depends upon the search for truth and its free exposition. Universities with academic freedom are essential to these purposes both in teaching and scholarship/research. Employees are entitled, therefore, to [...] freedom in carrying out teaching and in discussing their subject." Similarly, the Collective Agreement between the Canadian Union of Public Employees Local 4600 Unit 2 and Carleton University (Article 10) [...] protects each member's freedom to disseminate their opinion both inside and outside the classroom, to practice their profession as teacher and scholar, to carry out such scholarly and teaching activities as they believe will contribute to and disseminate knowledge."

WITHDRAWAL WITHOUT ACADEMIC PENALTY

The last day to withdraw from full fall term and fall/winter courses with a full fee adjustment is September 30th, 2023. The last day for a fee adjustment when withdrawing from winter term courses or the winter portion of two-term courses is January 31, 2024. **The last day for academic withdrawal from full fall and late fall courses is November 15, 2023.** The last day for academic withdrawal from full winter, late winter, and fall/winter courses is March 15, 2024.

WDN: For students who withdraw after the full fee adjustment date in each term the term WDN will be a permanent notation that appears on their official transcript.

OFFICIAL FINAL EXAMINATION PERIOD

Fall courses: December 10-22, 2023. Winter and Fall/Winter courses: April 13-25, 2024 (may include evenings & Saturdays or Sundays)

For more information on the important dates and deadlines of the academic year, consult the Carleton 2023-2024 Calendar.

GRADING SYSTEM

Although CGSC5101/HCIN5400 is a graduate course, I will use the same grading system described in the Undergraduate Calendar section 5.4.

PLAGIARISM

The University Senate defines plagiarism as *“presenting, whether intentional or not, the ideas, expression of ideas or work of others as one’s own.”* This can include reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source. Examples of sources from which the ideas, expressions of ideas or works of others may be drawn from include but are not limited to: books, articles, papers, literary compositions and phrases, performance compositions, chemical compounds, artworks, laboratory reports, research results, calculations and the results of calculations, diagrams, constructions, computer reports, computer code/software, material on the internet and/or conversations.

Examples of plagiarism include, but are not limited to:

- any submission prepared in whole or in part, by someone else, including the unauthorized use of generative AI tools (e.g., ChatGPT);
- using ideas or direct, verbatim quotations, paraphrased material, algorithms, formulae, scientific or mathematical concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another’s data or research findings without appropriate acknowledgement;
- submitting a computer program developed in whole or in part by someone else, with or without modifications, as one’s own; and -failing to acknowledge sources through the use of proper citations when using another’s work and/or failing to use quotations marks.

Plagiarism is a serious offence, which cannot be resolved directly with the course’s instructor. The Associate Deans of the Faculty conduct a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They range from a mark of zero for the plagiarized work to a final grade of “F” for the course, and even suspension from all studies or expulsion from the University.

General Information

- Students must always retain a copy of all work that is submitted.
- All final grades are subject to the Dean’s approval.
- For us to respond to your emails, we need to see your full name, CU ID, and the email must be written from your valid CARLETON address. Therefore, in order to respond to your inquiries, please send all email from your Carleton CMail account. If you do not have or have yet to activate this account, you may wish to do so by visiting <https://carleton.ca/its/help-centre/email/#sect2>

Class Schedule / Topics / Assignments

Week	Date	Topic	Assignment
1	September 7	Review course outline + An introduction to R	–
2	September 12 & 14	Descriptive statistics + Drawing graphs	–
3	September 19 & 21	Logic of research design, methods of data collection, writing research reports	–
4	September 26 & 28	Wrangling data	Assignment 1 due 11:59 PM September 29
5	October 3 & 5	Statistical theory: probability, estimating, null hypothesis significance testing (NHST)	–
6	October 10 & 12	Categorical data analysis	Assignment 2 due 11:59 PM October 13
7	October 17 & 19	Comparing two means	–
-	October 24-26	FALL BREAK - no classes	-
8	October 31 & November 2	Comparing several means: ANOVA	Assignment 3 due 11:59 PM November 3
9	November 7 & 9	Comparing several means: repeated measures & factorial ANOVA	–
10	November 14 & 16	Linear regression 1	Assignment 4 due 11:59 PM November 17
11	November 21-23	Linear regression 2	–
12	November 28 & 30	Advanced statistics	–
13	December 5 & 7	Loose ends + Final assignment discussion	Assignment 5 due 11:59 PM December 8

N.B. - This schedule is meant to be a guide and may be subject to change. Any changes will be announced.

Course outline revision history

- v1.0 original version (August 18, 2023)