

CGSC 5101 – HCIN 5400: Experimental Methods and Statistics
INSTITUTE OF COGNITIVE SCIENCE, CARLETON UNIVERSITY
Winter 2021

Class Information

Lecture dates: Friday, January 8 – April 9, 2020
Lecture time: 1435 – 1725
Lecture location: TBD

Instructor Information

Instructor: Chunyun Ma
Office: TBD
E-mail: chunyunma@cmail.carleton.ca
Office hours: Friday, 1730-1830 or by appointment

Course Description

This course is an introduction to the design of experiments and the statistics needed to interpret data from them. The focus of the course will be on developing a conceptual understanding of the various statistical methods and their applications for answering research questions about cognitive science and human-computer-interaction phenomena, and in particular on the presentation and interpretation of results. This course is intended for students who have not taken advanced undergraduate or graduate statistics courses. Upon successful completion of this course, students can expect to be able: 1) to select appropriate statistic techniques given a research question, 2) to execute chosen statistical techniques using the R statistical software package, and 3) to present results to an audience with diverse background.

The classes will consist of short lectures interspersed with collaborative hands-on activities and analyses using the R statistical software package (<https://www.r-project.org/foundation/>). Thus, if students have a laptop, they are strongly encouraged to bring it to class. Anyone wishing to audit the course should speak to the instructor.

I can never stress enough how important it is to dedicate time for this course outside of the lectures. As a rule of thumb, please make sure that you set aside at least three hours each week to work on assignments/projects related to this course. If you are new to the topic, consider allocating six hours.

Materials (reference, software)

Students are not expected to buy any textbook for this course. Reading material for each lecture will be made available through the course website.

Software required: Our in-class and homework activities require the use of R – freely available under the GNU General Public License, and the open source edition of R studio --- an integrated development environment (IDE) for R. In case the class is being held online, please refer to <https://carleton.ca/its/help-centre/faq-technical-specs-for-new-students/> for minimum technical requirements.

Course Web Page (cuLearn)

The course website is located at <https://carleton.ca/culearn/>. On this site you will find the course outline, schedule, assignments, sample data sets, and supplementary readings, materials and handouts for the class.

Evaluation

Item	Weight of Grade (%)	Due date
Online Module + Cheat sheet	2 + 3	Saturday, Jan. 16, 1400
Online Module + Cheat sheet + Project seed	2 + 3 + 5	Saturday, Jan. 23, 1400
Online Module + Cheat sheet + Project synopsis	2 + 3 + 5	Saturday, Jan. 30, 1400
Online Module + Cheat sheet	2 + 3	Saturday, Feb. 6, 1400
Online Module + Cheat sheet + Descriptives	2 + 3 + 5	Friday, Feb. 12, 1900
<i>Reading week, no class</i>		
Online Module + Cheat sheet	2 + 3	Saturday, Feb. 27, 1400
Online Module + Cheat sheet	2 + 3	Saturday, Mar. 6, 1400
Online Module + Cheat sheet	2 + 3	Saturday, Mar. 13, 1400
Online Module + Cheat sheet	2 + 3	Saturday, Mar. 20, 1400
Online Module + Cheat sheet	2 + 3	Saturday, Mar. 27, 1400
Online Module + Cheat sheet	2 + 3	Saturday, Apr. 3, 1400
Final project deliverable	30	Friday, Apr. 23, 1400

There is no mid-term or final exam for this course. Instead, you will be working on weekly assignments throughout the semester. Each assignment consists of two parts:

- Completing an online module (2% each week) and compiling a list of R scripts that you learned from the module (3% each week). Completing each module will take 3-4 hours. Instead of doing the module in one shot each week, I highly encourage you to work on it consistently, spending 30 – 40 minutes per day. For students who show steady progress, a half percentage bonus point will be awarded each week (up to 5% throughout the semester).
- Working on one project throughout the term. There will be four deliverables for this project, including a project seed, synopsis, descriptives, and final write-up (requirements of each deliverable will be made available and discussed in-class). At the end of the term, you will have an opportunity to present your work in front of the class. This oral presentation will be graded and contribute to your final mark.

All assignments must 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 deliverable, which must be submitted on time. If you intend to use the pass, you must email me **before** the due date to let me know.

Participation

Attendance is expected in all classes and participation in classroom discussion is strongly encouraged. If you do not attend class, then you are responsible for the material missed (and should not use office hours to replace class time, unless the absence was due to documented illness or bereavement).

In case the class is being held online, synchronous sessions will be recorded for students who could not participate due to various reasons.

Lecture Schedule *

Date	Lecture Topic
Jan. 8	Correlation and simple regression
Jan. 15	Sampling
Jan. 22	Confidence interval and standard error
Jan. 29	Hypothesis testing
Feb 5	<i>t</i> -tests
Feb 12	Review, Q&A
Feb 19	<i>Reading week, no class</i>
Feb 26	<i>p</i> -hacking
March 5	ANOVA
March 12	Revisit regression
March 19	Regression II
March 26	Special topics - TBA
April 2	<i>Easter Friday, no class</i>
April 9	project check in time

* Note: The schedule is tentative and may change as the class moves forward.

E-mail Protocol

I will respond to e-mails within 24-48 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 Statement

Plagiarism and cheating at the graduate level are viewed as being particularly serious and the sanctions imposed are accordingly severe. Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy (See <http://www1.carleton.ca/sasc/advisingcentre/academic-integrity>). Plagiarism and cheating – presenting another’s ideas, arguments, words or images as your own, using unauthorized material, misrepresentation, fabricating or misrepresenting research data, unauthorized co-operation or collaboration or completing work for another student – weaken the quality of the graduate degree. Academic dishonesty in any form will not be tolerated. Students who infringe the Policy may be subject to one of several penalties including: expulsion; suspension from all studies at Carleton; suspension from full-time studies; a refusal of permission to continue or to register in a specific degree program; academic probation; or a grade of Failure in the course.

For the assignments, you are welcome to work collaboratively to discuss techniques and interpret the results. However, each class member must hand in a separate assignment that is written in his or her own words – this includes their own tables and figures (not ones copied from a colleague’s output). The final project is an independent project, based on a student’s own data or on a dataset chosen in collaboration with the instructor.

Additional Resources

Learning Support Services: This service is operated by the [Student Academic Success Centre](#) and offers a variety of services designed to support student learning. For example, they offer group study rooms, free drop-in sessions with study skills specialists and writing tutors, free academic skills workshops, networked computers, a tutor referral service, and supportive peer helpers. They are located in the MacOdrum Library. For more information, visit the [LSS Website](#).

Regulations and Information Common to all Cognitive Science Courses

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:

Pregnancy 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](#)

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).

PETITIONS TO DEFER

Students unable to complete a final term paper or write a final examination because of illness or other circumstances beyond their control or whose performance on an examination has been impaired by such circumstances may apply within five working days to the Registrar's Office for permission to extend a term paper deadline or to write a deferred examination. The request must be fully and specifically supported by a medical certificate or other relevant documentation. Only deferral petitions submitted to the Registrar's Office will be considered.

WITHDRAWALS

The last day to withdraw from a Winter 2020 course, without academic penalty, is April 7, 2019.

The last day to withdraw from a Winter course with a full [fee adjustment](#) (financial withdrawal) is January 31.

Withdrawals after this date will create no financial change to term fees but **will result in a grade(s) of WDN appearing on your official transcript.**

OFFICIAL FINAL EXAMINATION PERIOD

Winter 2022 courses: April 13-25, 2020 (may include evenings & Saturdays or Sundays). For more information on the important dates and deadlines of the academic year, consult the Carleton 2019-2020 Calendar.

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;
- submitting a take-home examination, essay, laboratory report or other assignment written, in whole or in part, by someone else;
- using ideas or direct, verbatim quotations, or paraphrased material, concepts, or ideas without appropriate acknowledgment in any academic assignment;
- using another's data or research findings;
- failing to acknowledge sources through the use of proper citations when using another's works and/or failing to use quotation marks;
- handing in "substantially the same piece of work for academic credit more than once without prior written permission of the course instructor in which the submission occurs."

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.

GRADING SYSTEM

Letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100	B = 73-76	C - = 60-62
A = 85-89	B - = 70-72	D+ = 57-59
A - = 80-84	C+ = 67-69	D = 53-56
B+ = 77-79	C = 63-66	D - = 50-52
F	Failure. No academic credit	
ABS	Absent from the final examination	
DEF	Official deferral (see "Petitions to Defer")	
FND	"Failed, no Deferral" – assigned when the student is absent from the final exam and has failed the course on the basis of inadequate term work as specified in the course outline.	

Standing in a course is determined by the course instructor, subject to the approval of the Chair and Faculty Dean.

ICS RESOURCES (613-520-2600, phone ext. 2522)

Department of Cognitive Science (2522)	2221 DT (Dunton Tower)
Registrar's Office (3500)	300 Tory
Student Academic and Career Development Services (7850)	302 Tory
Paul Menton Centre (6608)	501 University Centre
Writing Tutorial Service (1125)	4 th fl Library
Learning Support Services (1125)	4 th fl Library

Academic Advising

Visit the Cognitive Science Undergraduate Office, DT 2221 to discuss your program. Advisors can answer questions concerning:

- Course selection and meeting program requirements
- Your audit and transfer credits
- Gaining access to courses that are closed
- Information concerning prerequisites and preclusions
- Course equivalencies and substitutions
- Information about whether to pursue the (Honours Project Course) or the Thesis stream and CGPA requirements
- Community Practicum Course
- Concentrations
- Exchanges and course selection

DEPARTMENTAL DROP BOX POLICY – Located outside 2202A DT

Mail received prior to 8:30am will be date stamped with yesterday's date. Mail received before 8:30am on Monday's will be date stamped with the previous Friday's date. Please include your name, student number, course code and instructor's name. If any of this information is miss