

Geography 3003: Quantitative Geography

Winter 2022

Instructor: Murray Richardson, PhD

Email: murray.richardson@carleton.ca

Contact Options:

- Using “Ask the instructor” on Brightspace
- Meet “face-to-face” online via Zoom Link on Brightspace (after class or by appointment)
- Email: murray.richardson@carleton.ca

Meetings: Online Lectures on Thursdays 8:35 am – 10:25 am and Online Tutorials on Tuesdays 10:35 am – 12:25pm.

Teaching Assistant: Frederic Brieger

Email: fredericbrieger@cmail.carleton.ca

Contact Options: TBA

Prerequisites: GEOG 2006 (Statistical Methods in Geography) or Permission of the Department

I. Course Description:

This course focuses on quantitative methods for geographers using *R* - a popular, open-source statistical software and programming environment. Topics include data management, descriptive statistics, hypothesis testing, linear regression and correlation, multiple regression, principal component analysis, cluster analysis, descriptive *spatial* statistics and introductory geostatistics. A strong emphasis is placed on understanding and interpreting these statistical analyses and their results in relation to real-world questions, with a focus on geographically-varying phenomena such as climate, pollution and socio-economic and demographic indicators of health and well-being. Students will acquire new skills in data-management, statistical analysis and scripting using a powerful (and freely available), command-line statistics and graphing environment. The course does not require any previous computer programming experience or major expertise in math, but an interest in problem-solving and computer-based learning is a must.

"I keep saying the sexy job in the next ten years will be statistician... The ability to take data—to be able to understand it, to process it, to extract value from it, to visualize it, to communicate it—that's going to be a hugely important skill in the next decades, not only at the professional level but even at the educational level for elementary school kids, for high school kids, for college kids." — **Hal Varian**, Chief Economist, Google Inc. 2009

II. Required Texts (available at Carleton University Bookstore):

- 1) Harris and Jarvis, 2011 *Statistics for Geography and Environmental Science*.

Weekly assigned resources, including online content and readings from this text will be clearly indicated on Brightspace. You will not be able to complete the quizzes successfully without the required textbook.

III. Evaluation:

Online Quizzes (20%): Approximately weekly online quizzes will cover material in the assigned readings (textbook and course PDFs), including fundamental R skills learned in class or through the course PDFs. You will have the opportunity to re-take the quiz to help you study, but only the mark from your first attempt will count. Quizzes completed after the start of class in which they are due will not count for marks and you will not have a chance to make up missed quizzes without good reason (i.e. medical note or other situation beyond your control that you speak to the instructor or TA about).

Assignments (40%): These will generally require that you process data files, generate results, and interpret those results. The emphasis in grading will be on your results and interpretation. Detailed instructions will be supplied. Assignment due dates will be posted in the schedule and online.

For each assignment, you will receive a PDF format document outlining the instructions and questions. You will submit your answers to each question through Brightspace using the link specified for that assignment. Each question will have a text or numeric entry option, with the question number and text repeated from the PDF format for clarity. You will also need to upload image files showing any required figures, and a copy of your R script in plain text format.

Mid-term tests (15%): These will cover all material up to the test date. The lower of the two test grades will be dropped and only the higher one used for your final grade assessment in this category. The tests will be open book and will cover theory and practical knowledge through multiple choice, short-answers, and use of R and RStudio to conduct short statistical analyses.

Take-home examination (15%): This will come in the form of a multi-part online test to be completed anytime prior to the test deadline. Questions may include written answers, multiple choice, and questions requiring data analysis with R.

Meeting attendance and participation (10%): Attendance (at one online session per week) will be tracked using the Zoom application. Attendance without any evidence of participation/engagement throughout the semester (e.g. asking questions, responding to questions) will be considered for a partial participation grade only.

IV. Other Course information:

Online Meetings: All students are expected to attend the online lectures and tutorials. Attendance and participation will be tracked. All sessions will be recorded and made available for review. However, these recordings are not optimized for online learning as they are only meant for reviewing. They are, in no way, a substitute for attending online synchronous meetings. Occasionally, a synchronous meeting may be replaced with a pre-recorded meeting but you will be made aware of this arrangement ahead of time.

Synchronous lectures have been shortened for online delivery and assume all participants have completed the assigned readings and quiz material prior to the meeting. Tutorials will include step by step demonstrations and instructions and are an opportunity to ask questions and get live help from the instructor(s). Most assignments span two weeks and the first week will always include an introduction to the assignment and necessary demonstrations. The second week will be more like supervised work periods but will include additional demonstrations as needed.

Software: During this course, you will make extensive use of the “R statistical programming language” and you will interact with it using the “RStudio Integrated Development Environment”. You will need to download and install these two free software packages at the links below. They can both run on either macOS or Windows platforms (as well as Linux). The computer hardware requirements to run these software packages are not prohibitive in any way – if you can join online sessions for university courses, you can also run these on the same computer:

R: <https://cran.r-project.org/>

RStudio desktop: <https://rstudio.com/products/rstudio/download/>

Assignment Late Submission Policy: Your online assignment submission must be time-stamped prior to the due date indicated or it will be considered late. ***Late assignments will be penalized at a rate of -3% per day and will not be accepted after 1 week (7 days) following the official due date.*** If severe circumstances beyond your control prevent you from handing in your assignment on time, or if you have already arranged for an academic accommodation, the late penalty may be waived at the instructor’s discretion.

Weekly Course Structure:

The weekly structure of the course, including typical activities and expectations are as follows:

- Complete textbook and course PDF readings and other weekly assigned resources on your own schedule, prior to the lecture to which they are assigned;
- Complete online quiz associated with weekly assigned resources prior to attending lecture;

- Attend the online Zoom meetingd for live online lectures and practical instruction
- Make use of “Ask your instructor” for course content and schedule related questions (if possible, please limit your use of email to the instructor; use it primarily for more personal issues that require discussion or to arrange an in person Zoom meeting)

Finally, please note that to avoid the necessity for 2 hour online lectures about statistics which would not be the most effective way to deliver content, this class will be following a “flipped-classroom” structure. Much of the content and theory will be covered asynchronously by students on their own time through the weekly assigned resources and quizzes. For this reason, it is imperative to make the most of the limited class time by coming prepared, having completed the assigned tasks on time.

Attendance and participation will be tracked and graded as part of your final mark for the course. Students are expected to attend all synchronous online meetings, even though recordings will be available afterwards. Please understand that it will be very difficult or impossible to successfully participate completely asynchronously in this course. At the same time, we recognize there will be challenges and will work with you to provide flexibility. Some of this will likely involve the recording of synchronous sessions. If you have a genuine scheduling issue that prevents you from attending one or more meetings (either the lecture or the lab), please contact the professor by email at least 24 hours ahead of time to arrange access to a recording of the meeting.

Student Zoom Accounts

For participation and attendance tracking in zoom, students must use a zoom account (<https://zoom.us/signup>) **based on their Carleton email address**. Each time you are joining a lecture or a lab session please use your first and last names as used in Carleton's records (like the ones on your Carleton student card).

Privacy issues related to recordings of online meetings

The sudden switch to online learning creates potential privacy problems that we never had to worry about in the past. When we do synchronous video calls and we have cameras on, we are opening windows into our homes. Please respect that fact with all your fellow students and instructors. Do not record people without their permission, and do not distribute recordings that may be made available by the instructor, to anyone outside of the course. Remember, it's not just the course materials anymore, now it is also recordings of what was said and seen and shown by all of your classmates. If you have any concerns about privacy, don't hesitate to bring them up with the instructor.

Finally, we ask all students to provide permission for these recordings, under the conditions outlined above, i.e. that the recordings only be used for the purposes of reviewing or getting caught up while taking this class. This permission will be requested in the “course outline review quiz” that all students are asked to complete, prior to our first online meeting.

V. Instructional and Conduct Offences

Carleton University has clear and firm policies regarding instructional and conduct offences. Instructional offences include among other activities cheating, contravening examination regulations, plagiarism, submitting similar work in two or more courses without prior permission, and disrupting classes. Conduct offences apply in areas of discrimination and sexual harassment. Further information about the University’s Academic Integrity Policy can be found at: <http://www2.carleton.ca/studentaffairs/academic-integrity>.

Plagiarism is one kind of instructional offence. Examples of plagiarism include:

- Reproducing or paraphrasing portions of someone else’s published or unpublished material, and presenting these as one’s own without proper citation or reference to the original source;
- Submitting an 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;
- Failing to acknowledge sources through the use of proper citations when using another’s works and/or failing to use quotation marks;

Additionally, for GEOG 3003, 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” as described in the former Carleton University guidelines for plagiarism, is not allowed.

For more information on how to cite sources, refer to the library web page “*Citing Your Sources*” available at <http://www.library.carleton.ca/help/citing-your-sources>. Plagiarism is a serious offence which cannot be resolved directly with the course 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 include sanctions ranges from a grade of zero for the assignment to suspension from your program of study.

Academic Accommodation:

You may need special arrangements to meet your academic obligations during the term. You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://www.carleton.ca/equity/>. 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.

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.

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). Requests made within two weeks will be reviewed on a case-by-case basis. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (<https://carleton.ca/pmc/>) for the deadline to request accommodations for the formally-scheduled exam (if applicable). Please note – if you do not meet with your instructor to discuss your letter of accommodation we cannot guarantee your required accommodation. *It is your responsibility to approach us about this.* You can visit the Equity Services website to view the policies and to obtain more detailed information on academic accommodation at <http://www2.carleton.ca/equity/>.

Carleton University has suspended the need for a doctor’s note or medical certificate until further notice when requesting academic accommodation related to COVID-19. Students should complete the self-declaration form available on the Registrar’s Office website to request academic accommodation for missed course work including exams and assignments. Here is the link to the form: <https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf>. For more information about deferrals for final exams/take-home exams please see these websites: <https://carleton.ca/registrar/deferral/> and <https://stuapps.carleton.ca/sarms/registrar/deferral>. Please note that students may also submit a COVID-19 self-declaration form instead of a medical note for these deferrals.

Students are encouraged to connect directly with their instructors to discuss required accommodations arising from the COVID-19 situation. Equity and Inclusive Communities and Academic Advisors can also be reached if students are unable to reach out to instructors directly.

Campus Resources for Students

Student Experience Office <http://www.carleton.ca/seo/>

Health and Counselling Services <http://www.carleton.ca/health>

International Student Services Office <http://www.carleton.ca/isso>

Academic Advising <https://carleton.ca/academicadvising/>

Career Services <https://carleton.ca/career/>