
SPPH 581C Special Topics
Methods for Analyzing Routinely Collected Data
Winter 2023/2024 (Jan 2024 – March 2024)

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Contact information: Room 201 – 2006 East Mall, SPPH Building

Acknowledgement: UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəyəm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

Prerequisites:

- Multivariate statistical methods. SPPH 500 (or equivalent) and additional experience with data analyses. There are no corequisites.
 - Exposure to an analytic programming language such as SAS or R.
 - Permission of the instructor.
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Abstract: This course will follow regular in-person classroom instruction. Hybrid and online lectures are not offered. Classes will be held on Monday mornings, 9am PST until noon PST, unless otherwise discussed with the class.

This is a data-driven course that focuses on applying supervised/unsupervised machine learning methods and non-standard analytic problems with healthcare data. The data that will serve as the motivation will be large clinical and administrative databases commonly used in health services research in Canada, such as hospital discharge data. Students in this course will be exposed to, and apply, advanced statistical methods for analyzing sophisticated healthcare-based data problems. Permission of the instructor is required to register for the course.

Drawing from machine learning applications and traditional statistical methods, students will encounter topics including:

- Cluster Analysis
- Principal Components
- Missing Data Problems
- Classification and Regression Trees
- Mixture Models
- Lifetime models
- Spline Regression Models

- Additive Models

Acquisition of methods will be based on problem-based learning. During the course, students will be introduced to new analytic concepts, progress through the principles of advanced methods, learn the adjuvant analytic techniques with software tools (SAS), identify resources to assist with the development of their skills, and synthesize their learnings by applying the methods to observational datasets, interpreting their results and sharing their findings with their peers.

Progressing through the statistical methods, students will acquire methods for data manipulation, learn coding in SAS, data cleaning, summarizing data, preparing brief reports and presenting findings to peers. SAS will be used for at least one-half of the programming; be prepared to learn SAS. Register for SAS on Demand for academics (SPPH 581C is registered).

While there are no formal textbooks for this course, the instructor will provide readings and references to students. Students will also be responsible for identifying and evaluating resources they found helpful in learning.

Learning Objectives:

1. Importing large administrative datasets;
2. Manipulating, merging and summarizing administrative datasets;
3. Cleaning datasets and identifying inconsistent or incomplete variables ;
4. Develop SAS programming experience;
5. Expand repertoire of statistical methods commonly used in machine learning;
6. Implementing and interpreting advanced statistical methods to complex datasets;
7. Effective oral and written communication of the findings of analyses;
8. Class presentations of analytic assignments.

Learning Activities:

1. Engage in classroom discussions;
2. Participation in online discussions;
3. Oral presentations are required;
4. Read relevant materials.

Prerequisites:

- Multivariate statistical methods. SPPH 500 (or equivalent) and additional experience with data analyses.
 - Exposure to an analytic programming language such as SAS or R.
 - Permission of the instructor.
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Course Structure:

- Lectures
 - Assignments
 - Student presentations
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Grade Structure and Assessment of Learning:

	Marks Available	Learning Objective
Assignments	7 X 12% = 84%	1 to 6
Student participation	6%	7
Presentations	10%	7 and 8

Grading System: Numeric.

Note: No late assignments will be accepted. Assignments are due to be emailed to the instructor by 5pm of the due date. Extensions will only be granted for extenuating circumstances.

Generative Artificial Intelligence (AI):

“The use of Chat GPT or other generative AI tools is permitted in this course. If you use generative AI to get ideas and/or partial answers for an assignment and/or to generate any text for a draft or final version of any part of an assignment, you must declare that you have used it. You must also add a couple sentences describing the extent to which it was used, and you must save any generated text from this tool in case it is requested. A TA or the instructor may ask you to provide the generated text in order to help with grading decisions.” (source: <https://ctlit.ubc.ca/resources/assessment-design-in-an-era-of-generative-ai/communicating-with-students-about-generative-ai/>)

University Policies:

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances.

Details of the policies and how to access support are available on the UBC Senate website: <https://senate.ubc.ca/policies-resources-support-student-success/>

UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Students should be aware of what behaviours constitute plagiarism. This form of academic misconduct is subject to penalties described in the Student Discipline section of the UBC calendar.

SPPH is committed to providing a positive education experience free from discrimination. If you have had an experience in this course where you feel unsafe, have been mistreated or have witnessed mistreatment, please let us know. If you want to raise this beyond the course instructor the School recommends the following. You may contact your academic supervisor, the education manager for your program or the Associate Director-Education. You may also report your concerns to the Faculty of Medicine Office of Respectful Environments, Equity, Diversity & Inclusion (REDI) at <https://mistreatmenthelp.med.ubc.ca/>. Both SPPH and the REDI Office have procedures in place for recording and acting on reports of mistreatment in the educational environment.

Course Grading Criteria:

A-level work: outstanding quality

- A+ reserved for the one or two pieces of exceptional work that far exceed or extend the quality of contributions available in the literature.
- A suggests that there is a very high level of scholarship throughout every aspect of the work. Work deserving of an A is distinguished in every aspect. This level of work demonstrates that the individual has gone well beyond what has been provided and has extended the usual ways of thinking or performing. Work of this level demonstrates outstanding comprehension of the subject and use of existing literature and research. The student shows a very high degree of engagement with the subject.
- A- suggests that there is generally a high quality throughout the work, no problems any significance and evidence of attention is given to each criterion. The work demonstrates a very good comprehension of the subject and use of existing literature and research. The student shows a very high degree of engagement with the subject.
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B-level work: good quality with no major weaknesses

- B+ suggests there is generally very good quality throughout the work, few problems of minor significance and evidence of attention given to each criterion. The work demonstrates a good comprehension of the subject and use of existing literature and research. For the most part, the work integrates critical and creative perspectives toward the subject material and shows a fair amount of engagement with the topic.
- B suggests there is generally good quality to aspects of the work, few problems of minor significance. Attention is given to several criterion. The work demonstrates a good comprehension of the subject and use of existing literature and research. The work demonstrates few examples of integrating critical and creative perspectives towards subject material and shows a fair degree of engagement with the topic.
- B- suggests there is some aspects of good quality to the work, some problems of minor significance. Attention is given to several criterion. The work demonstrates a good comprehension of the subject and use of existing literature and research. The work demonstrates few examples of integrating critical and creative perspectives towards subject material and shows a fair degree of engagement with the topic.
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C-level work: adequate work

C suggests there is generally adequate quality to the work, several problems of some significance. Attention given to few criterion. The work demonstrates fair comprehension of the subject and use of existing literature and research. The work demonstrates few examples of integrating critical and creative perspectives toward the subject material and minimal engagement with the topic.
