Department of Population Medicine
POPM*6520:
Introduction to Epidemiological and Statistical Methods
Fall 2020
First class: Thursday, Sept. 10, 13:00,
Online (see CourseLink for Zoom© link)

Course Coordinator and co-instructor
Olaf Berke (Biostatistics)
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Co-instructor:
Jan Sargeant (Epidemiology)
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Teaching Assistants:
Brianne Kinahan, bkinahan@uoguelph.ca (Epidemiology)
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Office Hours:
For course component taught by Jan Sargeant, please post any questions or areas for further discussion / clarification to the discussion section on the CourseLink site. Depending on class needs with remote semester, an hour-long "open question session" may be added.

Class schedule:
Tuesdays and Thursdays, 13:00 – 14:20
All classes are delivered remotely and synchronous, Zoom links are posted on CourseLink

Description: This is a 0.5 credit introductory graduate course for MPH students as well as MSc and PhD students in Population Medicine with an interest in epidemiology. The course will focus on questionnaire design and basic statistical methods for epidemiological studies, as well as providing an introduction to grant proposal writing.

Objectives:
Students who complete this course should be able to:
- Formulate a research question within the context of a theoretical and conceptual framework
- Structure a grant proposal to conduct an epidemiological study
- Plan, draft, and analyze a survey instrument (questionnaire) to identify determinants of health and disease
- Conduct basic statistical analyses of epidemiological data

Course approach:
This course will consist of two 80 minute sessions per week. For the statistics component (the second half of the course), class sessions will start with discussions around biostatistical methods and applications followed by demonstrations of statistical data analysis using the open software R/RStudio. Students will read-up on biostatistical methods in preparation for class (flipped class approach), and further their practical skills through homework exercises.

Pre-requisites:
POPM*6200 (Epidemiology I) is a co-requisite class. Students not taking Epidemiology I concurrently and who have not previously taken Epidemiology I will require permission of the course coordinator. Students seeking permission to take this course without the Epidemiology I course require at least one graduate-level course in epidemiology.

Pre-class preparation:
To enhance learning during classroom sessions, pre-class readings (or other preparation) have been assigned. Details are provided for each session later in this document. You are expected to complete the readings for each class prior to the class. The lectures will not necessarily cover all of the material in the lectures that you will be responsible for in assignments, and you will get much more out of the lectures having completed the pre-class readings.

1st half course topics: Epidemiology

Session	Day	Date	Instructor	Topic
1	Thursday	Sept 10	Sargeant	Course Introduction, Introduction to determinants of health
2	Tuesday	Sept 15	Sargeant	Theoretical and conceptual frameworks
3	Thursday	Sept 17	Sargeant	Formulating research questions and identifying study participants
4	Tuesday	Sept 22	Sargeant	Questionnaire design: Modes of administration
5	Thursday	Sept 24	Sargeant	Questionnaire design: Measurement in questionnaire design
6	Tuesday	Sept 29	Sargeant	Questionnaire design: Question wording
7	Thursday	Oct 1	Sargeant	Questionnaire design: Sources of error in questionnaire design
8	Tuesday	Oct 6	Sargeant	Questionnaire design: Informed consent / ethics, questionnaire layout
9	Thursday	Oct 8	Sargeant	Questionnaire design: Validating, pre-testing
		Oct 13		NO CLASS FOR THANKSGIVING BREAK!
10	Tuesday	Oct 15	Sargeant	Proposal writing I
11	Thursday	Oct 20	Sargeant	Proposal writing II

2nd half course topics: Biostatistics

Session	Day	Date	Instructor	Topic
12	Thursday	Oct 22	Berke	Introduction
13	Tuesday	Oct 27	Berke	Descriptive Statistics
14	Thursday	Oct 29	Berke	Probability and Distributions
15	Tuesday	Nov 3	Berke	Sampling and Inference
16	Thursday	Nov 5	Berke	Hypothesis Testing & the t-Test
17	Tuesday	Nov 10	Berke	More t-Tests
18	Thursday	Nov 12	Berke	ANOVA and the F-Test
19	Tuesday	Nov 17	Berke	Testing Proportions & χ^2-tests
20	Thursday	Nov 19	Berke	Correlation and Linear Regression
21	Tuesday	Nov 24	Berke	Multiple linear Regression & Regression Diagnostics
22	Thursday	Nov 26	Berke	Logistic Regression
23	Tuesday	Dec 1	Berke	Survival Analysis
24	Thursday	Dec 3	Berke	Review & Summary
	Monday	Dec 14	Berke	***Final Exam: Biostatistics***

Overview of evaluation methods:
Your performance is evaluated by a series of assignments, a mid-term and final exam as well as a term project as follows:

Epidemiology component (total = 50%)
5 assignments, each worth 5% of final mark = **25%**

1) Submission of proposed research question for questionnaire assignment (due prior to class on Sept 24th)
2) Modes of administration for questionnaires (due prior to class on Oct 1st)
3) Appropriateness of questions (due prior to class on Oct 8th)
4) Completion of tri-council ethics certificate (can be completed any time PRIOR TO due prior to Oct 15th)
5) Critical appraisal of grant proposals (due prior to class on Thursday, Oct 29th)

Questionnaire assignment: 25%. Due by 5 pm on Nov. 5th

Biostatistics component (total = 50%)
5 assignments, each worth **5%** of final mark = **25%**

6) Descriptive statistics and graphics (**due: Nov 2** at noon)
7) Distributions, statistical inference and t-tests (**due: Nov 9** at noon)
8) t- and F-tests (**due: Nov 16** at noon)

9) Test for proportions and χ^2-tests (**due: Nov 23** at noon)
10) Correlation and Linear Regression (**due: Nov 30** at noon)

Final exam (Monday, Dec 14 in the morning**): 25%**

Due dates
Assignments and project reports are due on due date and time as indicated. Late submissions will be penalized. Complete details will be provided on CourseLink.

Final exam
The final exam will be related to the statistics component of the course only and will performed remotely.

For the Biostatistics section the following books are online available from the library:

1. Petrie and Watson (2013) Statistics for Veterinary and Animal Science, 3rd edn. Wiley.
2. Dalgaard (2008) Introductory Statistics with R (2nd Edn.). Springer, New York.

Software
The statistics section of the course will make use of the open and free "R" software package in combination with "RStudio". You will have to install R and RStudio onto your computer (a respective handout on CourseLink explains the process).

CourseLink
Additional course materials and information regarding all assignments will be posted on the CourseLink website. The website can only be accessed by persons who are registered for the class, therefore it is imperative that students ensure that they are registered for the class and have access to CourseLink. If you have any problems accessing CourseLink, contact CCS at x58888 or 58888help@uoguelph.ca

Email Communication
As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement
When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.
Graduate Calendar - Grounds for Academic Consideration:
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

Drop Date
Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative

delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars. Graduate Calendar - Registration Changes:
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml

Copies of Out-of-class Assignments
Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility
The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student. When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway. Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability. Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day. More information can be found on the SAS website: https://www.uoguelph.ca/sas

Academic Integrity
The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.
Graduate Calendar - Academic Misconduct
https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml

Recording of Materials
Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources
The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs. Academic Calendars https://www.uoguelph.ca/academics/calendars