

Epidemiology II, POPM*6210

Credits: 0.5

Semester Offered: Winter 2012

Course Coordinator & Instructor:

David Pearl, Room 207B, Clinical Research Building, ext. 54748, dpearl@uoguelph.ca

Teaching Assistant:

Shiona Glass, Room 107, Clinical Research Building, ext. 54728, sglass@uoguelph.ca

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Evaluation:

2-hour midterm exam (25%)

3-hour final exam (45%)

Term project (30%)

Class Organization:

The class will meet for 1.5 hours on Tuesday and Thursday each week from 13:30-15:00. Traditional lectures will begin most topics, but students will be expected to participate in group discussions concerning analytical and reading assignments. Readings from the required textbook and journal articles will often be assigned at the end of class, and students will be expected to have read the articles and be prepared to discuss them in the following class. During lectures, students will also be introduced to a variety of software packages used for epidemiological research, especially STATA. All of these packages will be available through the OVC Network and/or the internet. Students will be expected to use these software packages for assignments and examinations. Assignments with answer keys will be provided regularly throughout the course. Students are expected to complete and review these assignments on their own. However, there will be time to review assignments with the instructor on and/or T.A. Tuesdays from 15:30-17:00 in the computer lab in room 2500 of the Stewart Building. All lecture overheads and other materials will be stored on the course's CourseLink site (<https://courselink.uoguelph.ca/shared/login/login.html>).

Course Objectives:

This course is complementary to Epidemiology I (POPM*6200). The overall objectives of the course are to help students develop skills in observational study design, data analysis, and statistical model building as it relates to observational epidemiological studies. Emphasis will be placed on using, understanding, and making inferences about associations/effects based on least squares, logistic, Poisson, and other multivariable

statistical analyses. In particular, the integration of causal thinking with statistical modeling will be a recurring theme throughout this course.

Required Textbook:

Veterinary Epidemiologic Research (2nd Edition) by Ian Dohoo, Wayne Martin, and Henrik Stryhn. AVC Inc., 2009.

This text can be purchased on line at <http://www.upei.ca/ver>, or in the bookstore.

Other Textbooks on Reserve:

Modern Epidemiology (2nd Edition) by Kenneth Rothman, and Sander Greenland, Lippincott Williams & Wilkins, 1998.

Veterinary Epidemiology by Wayne Martin, Alan Meek, and Preben Willeberg, Iowa University Press, 1987.

Veterinary Epidemiology (3rd Edition) by Michael Thrusfield, Blackwell Publishing, 2005.

PDQ Epidemiology (2nd Edition) by Geoffrey Norman and David Streiner, B.C. Decker, 1998.

Academic Integrity:

Students are expected to have reviewed the graduate calendar concerning academic integrity and academic misconduct, and should feel free to talk with the course instructors if they are concerned about these issues in relation to a specific assignment and/or examination (http://www.uoguelph.ca/registrar/calendars/graduate/2011-2012/genreg/sec_d0e1553.shtml).

Academic accommodations:

Students who require academic accommodation due to a disability must first contact the Centre for Students with Disabilities (CSD) (<http://www.uoguelph.ca/csd/>). The Centre will review the student's documentation concerning the disability and assist the student in making the appropriate arrangements with the faculty member.

Digital recordings:

Students are welcome to make their own audio and/or video recordings of the lectures with permission of the course coordinator and instructor. However, we will attempt to make a digital audio recording of each lecture that will be available through CourseLink (<https://courselink.uoguelph.ca/shared/login/login.html>). These recordings are for personal use only, and not to be re-broadcast publicly, posted on other on-line sites, or stored on other on-line forums without the written permission of the course coordinator and instructor.

Lecture Schedule:

Date	Lecture No.	Session Topic
Tuesday January 10, LLC 1715	1	Introduction to course, technology issues, causal concepts (Chapter 1)
Thursday January 12, LLC 1715	2	Observational study designs & review measures of association (Chapters 6-10)
Tuesday January 17, LLC 1713	3	Observational study designs & review measures of association (Chapters 6-10) Sample size considerations (Chapter 2)
Thursday January 19, LLC 1713	4	Selection bias: control and prevention (Chapter 12)
Tuesday January 24, Patho 1810	5	Information bias: impact and prevention (Chapter 12)
Thursday January 26, LLC 1713	6	Structural causal models & extraneous variables: understanding confounding and interaction (Chapter 13)
Tuesday January 31, LLC 1713	7a	Linear regression: basic theory and interpretation (Chapter 14)
Tuesday January 31, 2500 Stewart Building	7b	STATA lab and other exercises (3:30-5:00 pm)
Thursday February 2, LLC 1715	8	Linear regression: coding of continuous and categorical independent variables, partial F-test, and assessing the linearity of continuous variables (Chapter 14)
Tuesday February 7, LLC 1715	9	Linear regression: re-scaling, interaction, collinearity, and centering (Chapter 14)
Thursday February 9, LLC 1715	10	Linear regression: Predicted values, assessing overall fit, residuals, and transformations of Y-variables (Chapter 14)
Tuesday February 14, Patho 1810	11	Linear regression: outliers, leverage, and influential observations (Chapter 14) Approaches to model building (Chapter 15)

Thursday February 16, LLC 1715	12	Approaches to model building cont. (Chapter 15) Logistic regression: basic theory, maximum likelihood estimation, assumptions, and interpretation of coefficients (Chapter 16)
February 20-24		Winter Break
Tuesday February 28, 2500 Stewart Building	13	Midterm Examination 1:30-4:00 in the computer laboratory covering lectures 1-11
Thursday March 1, LLC 1713	14	Logistic regression: interpreting intercepts, interaction and confounding, goodness-of-fit (GOF), and predictive ability of models (Chapter 16)
Tuesday March 6, LLC 1713	15	Logistic regression: evaluating residuals, over-dispersion, and information measures for non-nested models (Chapter 16) Term Project Assigned
Thursday March 8, LLC 1713	16	Logistic regression: model building strategies, population attributable fraction, and conditional logistic regression (Chapter 16)
Tuesday March 13, LLC 1713	17	Introducing exact logistic regression and multinomial (Chapter 17)
Thursday March 15, LLC 1713	18	Poisson regression: modeling count and rate data, evaluating GOF and residuals (Chapter 18)
Tuesday March 20, LLC 1713	19	Poisson regression: over-dispersion, negative binomial models & zero-inflated models (Chapter 18)
Thursday March 22, LLC 1713	20	Clustered data: introduction to clustered data and “crude” analytical techniques for correcting for over-dispersion (post-hoc methods, robust standard errors, fixed-effects) (Chapters 20-23)
Tuesday March 27, LLC 1713	21	Clustered data: introduction to generalized estimating equations and mixed-models (Chapters 20-23) Term Projects are due in class
Thursday March 29, LLC 1713	22	Clustered data: advanced concepts in mixed-modeling (Chapters 20-24)

Tuesday April 3, LLC 1713	23	Ecological and group level studies (Chapter 29)
Thursday April 5, LLC 1713	24	Final exam review
Thursday April 12, 2500 Stewart Building		Final examination 1:30-4:30 pm in the computer laboratory

Note: Optional survival data analysis workshop being scheduled for May 2012 depending on class interest.