

## **SPPH 502 DL Epidemiologic Methods I: Course Syllabus Winter Term 2014**

### **Course Information**

**Class:** All face-to-face classes will take place in Rm. B104 at the School of Population and Public Health at 2206 East Mall on the UBC Campus. Please see the Course Schedule for dates and times for both the online and face-to-face components.

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Tutorials will be available; scheduling to be decided in class

### **Course Overview**

SPPH 502 is an introductory level course intended to provide students with a working knowledge of the basic concepts and methods of epidemiology. SPPH 502 provides the basis for describing and explaining disease occurrence in a community and an introduction to concepts and methods for developing, prioritizing, and evaluating public health programs. This is a required course for all students in the School of Population and Public Health. Students in other related disciplines may take the course with approval of the course instructor.

There are no prerequisites for this course and it may be taken concurrently with SPPH 400. SPPH 502 is a prerequisite for SPPH 500-506, 510-514, 530-31, and 543. Students with equivalent preparation in epidemiological methods may be eligible for exemption.

### **Texts and Resources**

Gordis L. Epidemiology, 5th Edition. Philadelphia, WB Sanders Co, 2014.  
The textbook is recommended, not mandatory. The 4th edition of Gordis or a similar general epidemiology textbook will suffice.

Other epidemiology textbooks for supplemental reading (On reserve at Woodward library for when students are on campus):

1. Friis R, Sellers, T. Epidemiology for Public Health Practice. 3<sup>rd</sup> ed. Boston: Jones and Bartlett Publishers, 2004.
2. Hennekens CH, Buring, JE. Epidemiology in Medicine. Toronto: Little, Brown and Co., 1987.

3. Kelsey JL, Whittemore, AS, Evans AS, Thompson WD. Methods in Observational Epidemiology, 2<sup>nd</sup> edition. Toronto: Oxford University Press, 1996.
4. Last, JM, Ed. A Dictionary of Epidemiology, 3<sup>rd</sup> edition. New York: Oxford University Press, 2001.
5. Oleckno W. Essential Epidemiology; Principle and Applications. Illinois: Waveland Press, Inc, 2002.
6. Rothman K, Greenland S. Modern Epidemiology. Philadelphia: Lippincott-Raven, 1998.
7. Streiner D, Norman G. PDQ Epidemiology. Connecticut: PMPH USA, Ltd., 2009.

### **Learning Objectives**

The overall goals of this course are to:

- a) Describe and explain disease occurrence in a community;
- b) Identify risk factors and causes of disease;
- c) Understand and measure risk at the individual and population level; and
- d) Evaluate the efficacy of health and disease-related interventions.

On completion of this course the student will be able to:

- a) Demonstrate a working knowledge of sources of population data;
- b) Use epidemiological concepts such as person, place, and time to describe the distribution and determinants of disease;
- c) Calculate rates and risks to describe the health status of populations;
- d) Describe standard approaches to investigations of disease outbreak;
- e) Assess the relevance and understand the limitations of various research designs in the study of disease causation, the assessment of effectiveness of clinical interventions, and the distribution and general impact of health services;
- f) Address threats to the validity of study design, including bias, misclassification, confounding, and effect modification;
- g) Evaluate the validity of screening and diagnostic tests;
- h) Understand issues related to measurement of prognosis of disease;
- i) Formulate and apply logical statements of causation based on a firm understanding of the criteria for drawing causal inferences from data;
- j) Identify, discuss and illustrate the basic principles, objectives, and elements of public health surveillance;
- k) Critically appraise published research; and
- l) Formulate an approach, based on sound epidemiological principles and methods, to etiologic and health services questions.

### **Course Structure**

SPPH 502 is a mixed mode, or *blended*, course. This means that you will be working with your instructors and fellow students both online and face-to-face in the classroom. It is necessary for you to participate fully in all parts of this course to successfully complete the course. Lectures, combined with pre-assigned readings, will outline epidemiologic

concepts and methods. Small group sessions, class discussions and assignments will provide an opportunity for application of these concepts.

### Readings

It is best if you do all the readings for the course. Readings appear in the 3<sup>rd</sup> column of the table below. They are usually Chapters in Gordis. Additional readings are either available within the Module or through Web Links on the navigation pane on the left side of the screen.

## SPPH 502 DL Epidemiologic Methods I Schedule

### Module 1 – Understanding the Epidemiologic Approach (Online)

Objectives	Content	Resources
Understand the epidemiologic approach	History of Epidemiology	Gordis, Ch. 1. Streiner, Ch.1, 2. .Course notes
Understand concepts of Incidence and Prevalence	Measures of Disease Frequency	Gordis, Ch. 3, p. 32-52 Course notes

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### Module 2 – Descriptive Epidemiology: Epidemiologic Concepts and Measures (In class – Sept 12, 13)

#### Topic – Disease Frequency

Apply knowledge from preparatory reading	Descriptive epidemiology	Class notes In-class small group exercise
Apply concepts of Incidence	Cumulative incidence, incidence density	Class notes In-class small group exercise
Apply concepts of prevalence and specialized measures of incidence and prevalence	Prevalence, specialized measures	Class notes In-class small group exercise

#### Topic: Comparing Risk

Understand and apply Absolute and relative measures of effect	Measures of Disease Risk	Gordis, Ch. 4, 11, 12
Comparison and standardization of rates, risk	Age Standardization	Class notes In class exercises

## Topic – Demographic Concepts and Terms

Understand Demographic Concepts and Terms	Demography	Omran, “The Epidemiologic Transition”, World Population Data Sheet”
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## Module 3 – Descriptive Epidemiology: Surveillance: (Online)

Objectives	Content	Resources
Reflect on and increase familiarity with concepts learned in class 1	Epidemiologic concepts and measures	Zhang, “What’s the relative risk?” On line tutorials BMJ web pages
Understand objectives, methods, and components of surveillance	Surveillance	Read online surveillance lecture with links to sites of interest, Complete exercise on surveillance Gordis, Ch. 3 p. 54-55. Gazarian – “Evaluation of a national surveillance unit.” VanRooyen – “After the Tsunami”
Prepare for next class on study design	Study Design	Gordis, Ch. 7,8,9,10,13. Hansotia, "Epilepsy or Diabetes" Bracken, “Reporting obs studies.” 8 – 136-145.

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## Module 4 – Analytic and Experimental Epidemiology (In Class - Oct 18, 19)

### Topic – Study Design

Understand structure, strengths and weaknesses of descriptive, case control and cohort studies	Design of observational studies	Course notes In class exercises Hansotia, "Epilepsy or Diabetes"
Understand structure, strengths and weaknesses of clinical trials	Design of clinical trials	Course notes Reginster, “Long term effects of glucosamine sulphate.
Recap morning content and expand on design concepts	Applications of study design	Course notes
Calculate sample size for needed statistical power	Sample size and power calculations	Course notes. Online learning objects.
Understand the methods of program evaluation	Program Evaluation	Gordis, Ch.17. Optional: Detsky “A Clinician’s Guide to Cost-Effectiveness Analysis”

### Topic - Surveillance

Consolidate knowledge on surveillance, study design	Study design, surveillance	Guest Speaker
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## Topic –Introduction to Outbreak Investigation

Understand how to conduct an outbreak investigation	Outbreak investigation	Guest speaker
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There will be a timed midterm exam around the week of Oct 27 – date to be determined in class

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## Module 5 – Fundamentals of Prognosis and Evaluation, Introduction to Outbreak Investigation, Synthesis of Studies, Midterm (Online)

### Topic: Screening and Prognosis

Objectives	Content	Resources
Understand concepts related to prognosis	Natural history, life tables, survival analysis	Course Notes Gordis, Ch. 5,6,18. Cadman, "Assessing the effectiveness..."
Evaluation of screening tests	Levels of prevention, bias in screening, components of screening tests	

### Topic: Outbreak Investigation – Worked Example

Application of epidemiologic methods to outbreak investigation	Outbreak investigation	Gordis, Ch. 2. Reingold, "Outbreak Investigations." "Waterborne cryptosporidiosis outbreak" Worked examples
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### Topic: Systematic Reviews and Meta-analysis

Prepare for Module 6	Systematic Reviews and Meta-analysis	Gordis, Ch. 19, pg 342, 349, Ch. 14 Naylor - "Meta-analysis and the meta-epidemiology of clinical research." Greenhalgh – "Papers that summarize other papers"
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There will be a timed midterm exam – date to be determined in class

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## Module 6 - Synthesis of Epidemiologic Data and Analysis (In Class - Nov 14, 15)

### Topic – Screening and Prognosis

Consolidate learning from online class	No new content	Instructor and students
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### Topic – Validity of Studies

Understand threats to validity of studies and methods of design and analysis to maximize validity	Bias, effect modification, confounding.	Gordis, Ch.15 Optional; Rothman – Partitioning Risk
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### Topic – Systematic Reviews and Meta-analysis

Understand principles and components of systematic review and meta-analysis	Systematic Review and Meta-analysis	Course notes. Online learning objects. McAlindon – “Glucosamine and Chondroitin for Treatment
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### Topic – Causation

Understand theories and principles of causal associations	Causation	Course notes In class exercises
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### Topic – Data Sources in Canada

To become familiar with sources of health care data in Canada and methods of accessing them.	Administrative Databases and Health Registries	Powerpoint Instructor
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There will be a timed final exam around the week of Nov 24 – date to be determined in class

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**Other important information regarding student evaluation and other topics can be found under “Course Overview” on the Home Page.**