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### PUBH 510.50: Introduction to Epidemiology

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**PUBH 510**  
**Introduction to Epidemiology**  
**3 credit hours**  
Spring 2013

**Instructor:** Curtis Noonan, Ph.D., Associate Professor of Epidemiology  
Department of Biomedical and Pharmaceutical Sciences,  
College of Health Professions and Biomedical Sciences

**Format:** Online  
For purposes of assignments and class activities, the week typically starts on Wednesday at Midnight (12:01 am) and ends on Tuesday at Midnight (11:59 pm).

**Office Hours:** Fridays 1-3pm  
Dr. Noonan will be available on the phone, via e-mail, and in his office by appointment.

**Contact Info:** [curtis.noonan@umontana.edu](mailto:curtis.noonan@umontana.edu),  
College of Health Professions and Biomedical Sciences  
Skaggs Building Room 280 (mail), Room 159 (office)  
Phone: 406-243-4957  
Fax: 406-243-2807

**COURSE DESCRIPTION**

This course introduces principles and methods of epidemiologic investigation and an overview of relevant biostatistical applications. Students will be provided with the basis for conducting and interpreting epidemiologic studies. The techniques of descriptive and analytic epidemiology are presented. Measures of disease frequency and quantitative measures to determine risk association will be described as well. Several types of study design will be introduced, including randomized trials, case-control and cohort studies, and outbreak investigations. Approaches for assessing causality and validity will be described. Finally, we will discuss approaches for using biomarkers in epidemiological studies.

**REQUIRED TEXT**

Gordis L. 2009. Epidemiology, 4<sup>th</sup> Edition. W.B. Saunders: Philadelphia, PA. ISBN# 978-1-4160-4002-6

**REQUIRED ADDITIONAL READINGS**

Additional readings or web assignments will be posted as necessary.

**COURSE OBJECTIVES**

At the end of the course the student should be able to:

1. Calculate direct and indirect age-adjusted rates.
2. Explain the procedures used for statistical hypothesis testing in epidemiological studies.
3. Differentiate the effect measures used in case-control versus cohort studies.
4. Interpret the use of p-values and confidence intervals when summarizing findings from epidemiological studies.
5. Develop written proposals for case-control and cohort studies to evaluate an association between a suspected risk factor and a disease/condition.
6. Design a case-control study for assessing the association between an environmental agent or behavioral factor and risk of disease.
7. Identify morbidity and mortality data sources for descriptive epidemiology.
8. Calculate key measures for assessing screening tests and screening programs.
9. Compute crude, stratified, and standardized disease rates.
10. Explain the role that epidemiology plays in public health and health policy.
11. Complete and discuss the self-study course "Protecting Human Research Participants" offered on-line by the NIH Office of Extramural Research.
12. Explain key terms in the areas of disease transmission, natural history of disease, outbreak investigations, and descriptive and analytical epidemiology.
13. Calculate rates, proportions, ratios, including outcome measures for observational studies.
14. Explain risk factor/disease associations in terms of population attributable risk.
15. Identify the key factors in assessing causal relationships in epidemiological studies.
16. Compare the strengths and limitations of different observational study designs.
17. Identify existing disease or environmental exposure surveillance at the international, federal, and local levels.
18. Describe where environmental agents can play a role in the natural history of disease and how periods of induction and latency effect the temporal sequence between exposure and disease.

19. Identify three different categories of biomarkers used in epidemiology.
20. Identify key events in the history of epidemiology.
21. Discuss the importance of causal criteria in assessing epidemiological findings.
22. Distinguish between the traditional epidemiological triad model of infectious disease causality and the multiple factor causal models.
23. Contrast the epidemiological population-based approach to disease with the medical patient-based approach to disease.

## **PUBLIC HEALTH PROGRAM COMPETENCIES**

**\* For a listing of learning objectives corresponding to each competency see**

<http://publichealth.health.umt.edu/sites/publichealth.health.umt.edu/files/documents/CompetenciesStudentVersion.pdf>

## **COURSE FORMAT**

This course will be delivered online with support from UOnline. Readings and assignments designed to develop applied skills will form the basis for review and discussion during the weekly class postings on the discussion board. As part of your reading assignment you are encouraged to answer the questions at the end of each chapter. The answers to these questions can be found at the end of the text (p361-2) with further explanation available via the website for the text. A self-study format (e.g., reading assignments, PowerPoint presentations, and web links) will be used to present key points, but the emphasis will be on discussion and application of the course material in assignments, exams and in a semester paper. As you will note in the Course Schedule, a typical “week” in this class begins on Wednesday, midnight and ends on the following Tuesday, midnight, unless otherwise noted in the syllabus.

## **UOnline Moodle Tutorial**

UOnline has made available an interactive tutorial for using Moodle as a student. The tutorial and other resources can be found at the following web site: <https://umonline.mrooms3.net/course/view.php?id=41>

## **Library Resources**

Some assignments may require library resources. To access the UM’s Mansfield Library resources from off-campus, students will be required to enter their SCAUID and password. This is the same ID and password that you use to login to Moodle and use for your official UM e-mail address. Information on resources available through the Mansfield Library can be found at [http://www.lib.umt.edu/services/distance\\_education.htm](http://www.lib.umt.edu/services/distance_education.htm)

According to the UM library web page: “When connecting to licensed library resources from off-campus, users will be prompted to login using the “standard UM-M computer access user ID” (SCAUID) and password. This is the same account used for campus wireless accounts and students’ Cue1 email. Creation of a separate library remote access account will no longer be necessary. For students this is the “first initial” + “last initial” + six digit unique number sign-on name, e.g. “jd123456”. Students and employees can now look up their SCAUID on [CyberBear](http://weblib.lib.umt.edu/remote.html)” (<http://weblib.lib.umt.edu/remote.html>)

If you need assistance with library resources, please contact Samantha Hines, the library’s distance learning coordinator at [Samantha.Hines@umontana](mailto:Samantha.Hines@umontana) or 406-243-4558. The toll-free number for the reference desk is 1-800-240-4939.

## **STUDENT ASSESSMENT**

1. Class participation 20%
  - Discussion lead (4%)
  - Participation in weekly discussion board (1% for each of 12 weekly postings)
  - Presentation of Personal Contact related to disease topic of Project Paper (4%)
2. Assignments 20% [6 assignments]
3. Project Paper 30%
4. Midterm exam 15%
5. Final exam 15%

This course will use the traditional letter grade option without the use of pluses or minuses. Therefore, final grades will consist of the following: A, B, C, D, F. Grades will be calculated based on the standard formula (90-100% = A; 80-89% = B; 70-79% = C; 60-69% = D; 59% and below = F).

## **Discussion Questions**

The Course Schedule is arranged in order to allow for students to participate in the Week’s Discussion Topics over the weekend, if needed. Each week one (or two) students will be assigned as discussion leads. The instructor will assign students to specific weeks during the first week of class. Discussion leads will be required to prepare a discussion question based on the week’s readings, lecture material, or other on-line assignments. Discussion leads will also be asked to locate and post a recent journal article from the peer-reviewed scientific literature that is relevant to the week’s topic. Along with the article posting, the Discussion Lead should post related discussion question(s). Discussion questions and relevant attachments must be posted by Friday at noon. This will allow adequate time for the other students to discuss the items and/or questions presented by the week’s discussants.

### **Weekly postings to the discussion board**

All students are required to participate in discussions every week by midnight (MST) on the Monday following the Friday postings by the Discussion Leads. As needed, the instructor will present follow-up comments to individual postings or to the class as a whole by midnight (MST) on Tuesday. Students should revisit the week's discussion to view and respond to comments from classmates and the instructor, as necessary. Comments to colleagues throughout the discussion week are encouraged. This format necessitates completion of readings and assignments as well as participation in the discussion board every week during the week. Class participation constitutes a portion of the grade.

### **Assignments**

Approximately every other week students complete a small assignment designed to provide practice in applying the course material. Assignments are due Tuesday midnight, MST, unless otherwise noted. Please refer to Syllabus for the due dates of each Assignment. Assignments are to be uploaded as a Word document to the instructor using the Assignment feature in Moodle.

Late assignments will be graded zero unless there are very serious and verifiable extenuating circumstances. Students who wish to request permission to submit an assignment late must contact Dr. Noonan well before the assignment deadline.

### **Project Paper**

A course project paper will constitute a portion of the grade. The project paper will be drafted in three sections with specific due dates for each section.

Section 1:	Descriptive epidemiology of selected disease
Section 2:	Problem statement and study question
Section 3:	Epidemiologic study design; all sections due

Detailed instructions for each section will be posted on Moodle. The first two due dates will serve as check points to allow an opportunity for the student and instructor to discuss the student's chosen topic and study question and revise these sections as necessary. The final paper will include all three sections. No formal grading will occur at the first two time points, but the final grade will be reduced by 10% for each day the student is late in turning in these sections. As with the Assignments described above, failure to turn in the final paper (i.e., all sections) by the specified due date will result in a zero for this portion of the grade.

### **Personal Contact**

When the student has selected a disease for their Project Paper, they will need to make a contact with a community person with some connection to the disease that has been selected. The selected person can be: 1) someone who has the disease; 2) a health care provider who treats people with the disease; 3) a public health worker who monitors the disease or runs screening or prevention programs for the disease; 4) a researcher who investigates the disease; or 5) a representative from a patient advocacy group for this disease. The student will interview this person, either in person or by telephone, but not by email. Following the Personal Contact, the student will write a one-page paper to summarize this encounter. The summary will NOT include the name or contact information of the person being interviewed. The summary should include the date of interview, the mode of interview (e.g., in person or by phone), the information provided by the interviewee, and how this encounter may have changed the student's perspective on the disease being studied. This summary will need to be posted to the Discussion Board by the specified due date. This summary will be included as a portion of the student's Class Participation grade. Please note that this encounter is designed to provide the student with a perspective on the disease that they may not otherwise discern through the reading of primary and secondary literature. However, the student should be careful not to include anecdotal or personal account information as part of the Project Paper.

### **Exams**

One midterm and one final exam will be administered through the Moodle system. The exams will be "open book" with a combination of multiple choice, short answer, and essay questions. The exams are timed and must be completed once the student has begun.

### **MOODLE COURSE PROCEDURES AND EXPECTATIONS**

Moodle will be used in this class and online activities will be required throughout the semester.

### **Announcements**

Class announcements will be posted by the instructor. UMOonline system administrators will sometimes post announcements about the Moodle system.

### **Communication**

Communication will take place using e-mail, discussion boards and the virtual classroom.

E-mail should be used for "private" communication with the instructor or other students. Any questions regarding grades or communication about more personal issues should be handled via email. E-mail should not be used for submitting assignments.

Important: Please put “PUBH 510” in the subject line for e-mail communication with the instructor. This helps the instructor in organizing and responding to e-mail communications.

Discussion boards are appropriate for questions or discussions that would normally occur in the classroom. Remember that the discussion board is public and your classmates can read what you post there!

### **Course Materials**

Assignments, reading notes, and a variety of readings will be posted on Moodle.

### **Submitting Assignments Electronically**

All assignments will be submitted electronically through the Assignments option within Moodle.

Important:

- Assignments are due at midnight, MST.
- Save your completed assignments as a Word document with the file name YourLastName\_AssignmentNumber (e.g. Smith\_assignment1.doc). If turning in a section of your semester paper you should use the file name YourLastName\_SectionNumber (e.g., Smith\_Section1.doc).
- Make sure that your name, the date, and the assignment number are also included at the top of your completed assignment.
- Submit your assignment through the Assignments area on Moodle. Assignments submitted by email will not be graded.

### **Logging In**

You are expected to log in every day of the week to read current announcements that have been posted. You may do this at any time of day. The Instructor will generally answer e-mails, respond to discussions, etc. during traditional work hours (M-F 9:00 a.m. – 5:00 p.m.).

### **Change Your Password**

You must change the password you use to access Moodle every 180 days. To avoid being temporarily locked out of the course, you may wish to change your password the first and last week of class. It is much easier to change your password rather than re-activating it after your password has expired. Change your password using this link: <http://grizmail.umt.edu/password.htm>

### **UM Public Health Course Syllabus Addendums**

**Please click on this link:** <http://www.health.umt.edu/schools/pch/documents/UMPublicHealthCourseSyllabusAddendums.pdf> to see the latest information on the following topics:

University of Montana Mission Statement  
School of Public and Community Health Science's (SPCHS) Mission Statement  
Preparatory Tutorials  
Accessibility  
Plagiarism Warning

### **ADDITIONAL NOTES**

Students with disabilities will receive reasonable accommodations in this online course. To request course modifications, please contact me as soon as possible. I will work with you and Disability Services in the accommodation process. For more information, visit the Disability Services website at <http://www.umt.edu/dss/> or call (406) 243-2243 (Voice/Text).

## COURSE SCHEDULE

Week	Topic(s)	Assigned Reading	Assignments/Exams
Week 1 1/28-2/5	History of epidemiology; Public health and epidemiology	Gordis, Ch 1, 19	
Week 2 2/6-2/12	Infectious disease transmission; Notifiable Conditions	Gordis, Ch 2	Assignment #1 DUE: 2/12
Week 3 2/13-2/19 [2/18 <i>President's Day</i> ]	Descriptive Epidemiology I: Outbreak Investigations	Principles of Epidemiology SS3030, Lesson 6: Investigating an Outbreak Pages 347 – 374, steps 1-6	
Week 4 2/20-2/26	Descriptive epidemiology II: Measures of disease frequency	Gordis, Ch 3 (pages 37-54) Gordis, Ch 4 (pages 59-73)	Assignment #2 DUE: 2/26
Week 5 2/27-3/5	Adjusting Rates; Survival and Life Tables	Gordis, Ch 4 (pages 73-81) Gordis, Ch 6	Semester Paper, Section 1 DUE: 3/5
Week 6 3/6-3/12	Diagnostic and screening tests	Gordis, Ch 5, 18	Assignment #3 DUE: 3/12
Week 7 3/13-3/19	Surveillance; Environmental Public Health Tracking	TBA; Gordis, Ch 3 (pages 54-56)	Personal Contact posting to Discussion Board DUE: 3/19
Week 8 3/20-3/26	Midterm Review Discussion of Study Questions for Semester Paper, Section 2	On-line discussion/question & answer; TBA	Midterm: 3/25-3/26
Week 9 3/27-4/9 [4/1-4/5 <i>Spring Break</i> ]	Experimental epidemiology; Randomized trials	Gordis, Ch 7, 8	Assignment #4 DUE: 4/9
Week 10 4/10-4/16	Cohort studies Biomarkers	Gordis, Ch 9, 16	Semester Paper, Section 2 DUE: 4/16
Week 11 4/17-4/23	Case-control studies Cross-sectional studies	Gordis, Ch 10, 13	Assignment #5 DUE: 4/23
Week 12 4/24-4/30	Estimating risk; Estimating the potential for prevention	Gordis, Ch 11, 12	Assignment #6 DUE: 4/30
Week 13 5/1-5/7	Causal inference; Assessing causality	Gordis, Ch 14, 15	Semester Paper, All Sections 1-3 DUE: 5/7
Week 14 5/8-5/10	Final Review	On-line discussion/question & answer	
Final			Final: 5/14-5/15