

APPLICATION FOR NEW COURSE

1. Submitted by the College of Public Health Date: January 15, 2008

Department/Division proposing course: Epidemiology

2. Proposed designation and Bulletin description of this course:

a. Prefix and Number EPI 714

b. Title* Epidemiologic Study Design

*If title is longer than 24 characters, write a sensible title (24 characters or less) for use on transcripts:

c. Courses must be described by at least one of the categories below. Include the number of actual contact hours per week for each category, as applicable.

() CLINICAL () COLLOQUITUM (2) DISCUSSION () LABORATORY (1) LECTURE
() INDEPEND. STUDY () PRACTICUM () RECITATION () RESEARCH () RESIDENCY
(X) SEMINAR () STUDIO () OTHER – Please explain: _____

d. Please choose a grading system: Letter (A, B, C, etc.) Pass/Fail

e. Number of credit hours: 3

f. Is this course repeatable? YES NO If YES, maximum number of credit hours: _____

g. Course description:

This course provides students with advanced course material relevant to the planning and execution of epidemiologic studies of various designs. The course will consider study designs which employ routinely collected data on disease occurrence, such as would be undertaken in government agencies and health departments, and the classic etiologic study designs including the case-control, prospective cohort, retrospective cohort, nested case control, case-cohort, and case-crossover designs. The course will focus considerable attention on measurement methods and measurement error, borrowing examples from the subfields of epidemiology including occupational, cardiovascular, and social epidemiology. Given current interest on multilevel methods of analysis, the class will discuss approaches to the incorporation of designing multilevel studies. Finally, we will consider recent advances in experimental epidemiology with consideration of controlled community trials.

h. Prerequisite(s), if any:

Introduction to Epidemiology (CPH 605) or consent of instructor

i. Will this course be offered through Distance Learning? YES NO

If YES, please circle one of the methods below that reflects how the majority of the course content will be delivered:

Internet/Web-based Interactive video Extended campus Kentucky Educational Television (KET/teleweb) Other

Please describe "Other": _____

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3. Teaching method: N/A or Community-Based Experience Service Learning Component Both

4. To be cross-listed as: _____
Prefix and Number Signature of chair of cross-listing department

5. Requested effective date (term/year): Fall / 2010

6. Course to be offered (please check all that apply): Fall Spring Summer

7. Will the course be offered every year? YES NO

If NO, please explain: _____

8. Why is this course needed?

This course is part of a series of advanced epidemiology and biostatistics courses being developed for the joint epidemiology/biostatistics PhD program in the College of Public Health.

9. a. By whom will the course be taught? Steven Browning

b. Are facilities for teaching the course now available? YES NO

If NO, what plans have been made for providing them?

10. What yearly enrollment may be reasonably anticipated?

10

11. a. Will this course serve students primarily within the department? Yes No

b. Will it be of interest to a significant number of students outside the department? YES NO

If YES, please explain.

Course will be of interest to students in public health, nursing, and medical fields who are pursuing research degrees.

12. Will the course serve as a University Studies Program course[†]? YES NO

If YES, under what Area? _____

[†]AS OF SPRING 2007, THERE IS A MORATORIUM ON APPROVAL OF NEW COURSES FOR USP.

13. Check the category most applicable to this course:

traditional – offered in corresponding departments at universities elsewhere

relatively new – now being widely established

not yet to be found in many (or any) other universities

14. Is this course applicable to the requirements for at least one degree or certificate at UK? Yes No

15. Is this course part of a proposed new program? YES NO

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If YES, please name: Joint PHD program in epidemiology and biostatistics

16. Will adding this course change the degree requirements for ANY program on campus? YES NO
 If YES[†], list below the programs that will require this course:

[†]In order to change the program(s), a program change form(s) must also be submitted.

17. The major teaching objectives of the proposed course, syllabus and/or reference list to be used are attached.
18. Check box if course is 400G or 500. If the course is 400G- or 500-level, you must include a syllabus showing differentiation for undergraduate and graduate students by (i) requiring additional assignments by the graduate students; and/or (ii) the establishment of different grading criteria in the course for graduate students. (See SR 3.1.4)
19. Within the department, who should be contacted for further information about the proposed new course?

Name: Steven R. Browning Phone: 218-2235 Email: srbrown@uky.edu

20. Signatures to report approvals:

4-1-08
 DATE of Approval by Department Faculty

GAYN G. CALDWELL / Glyn G. Caldwell, an
 printed name Reported by Department Chair signature

6-26-08
 DATE of Approval by College Faculty

Linda Alexander
 printed name Reported by College Dean signature

* DATE of Approval by Undergraduate Council

Linda Alexander
 printed name Reported by Undergraduate Council Chair signature

* DATE of Approval by Graduate Council

/
 printed name Reported by Graduate Council Chair signature

8/19/08
 * DATE of Approval by Health Care Colleges Council (HCCC)

Heidi Anderson / Heidi Anderson
 printed name Reported by Health Care Colleges Council Chair signature

* DATE of Approval by Senate Council

Reported by Office of the Senate Council

* DATE of Approval by University Senate

Reported by Office of the Senate Council

*If applicable, as provided by the *University Senate Rules*. (<http://www.uky.edu/USC/New/RulesandRegulationsMain.htm>)

EPI 714
Epidemiologic Study Designs

DRAFT

Syllabus
&
Schedule



University of Kentucky
College of Public Health

University of Kentucky
College of Public Health

Course Syllabus

Title:	Epidemiologic Study Designs
Course Number:	EPI 714
Time:	TBA
Credit:	3 Semester Hours
Class Location:	TBA
Faculty:	Steven R. Browning, MSPH, Ph.D. College of Public Health / College of Medicine Phone: 859-257-5678 EXT. 82235 E-mail: srbrown@email.uky.edu Office Hours: TBA

Course Description:

This course provides students with advanced course material relevant to the planning and execution of epidemiologic studies of various designs. The course will consider study designs which employ routinely collected data on disease occurrence, such as would be undertaken in government agencies and health departments, and the classic etiologic study designs including the case-control, prospective cohort, retrospective cohort, nested case control, case-cohort, and case-crossover designs. The course will focus considerable attention on measurement methods and measurement error, borrowing examples from the subfields of epidemiology including occupational, cardiovascular, and social epidemiology. Given current interest on multilevel methods of analysis, the class will discuss approaches to the incorporation of designing multilevel studies. Finally, we will consider recent advances in experimental epidemiology with consideration of controlled community trials.

Prerequisites: Introduction to Epidemiology (CPH 605) or consent of instructor

Credit: 3 semester hours.

Course Objectives:

After completion of this course in Epidemiologic Study Design, the student will be able to:

1. Differentiate between epidemiologic study designs, assess their relative strengths for addressing various research questions and for making causal inferences from these designs.
2. Understand the issues in the planning and implementation of various epidemiologic study designs and develop an appreciation for the hybrid study designs (e.g. case-cohort, nested case control, case-crossover) which are often employed in research.
3. Discuss conceptual approaches to considering induction periods and latent periods in the design of epidemiologic studies.
4. Appreciate the issues associated with sample size estimation in epidemiologic study design.
5. Develop the technical skills for assessing measurement error using various tools (i.e. questionnaires, environmental sampling instruments, clinical measurements).
6. Consider methods for improving the sensitivity of epidemiologic studies through the disaggregation of categories of exposure or disease entities.
7. Review and consider “state-of-the-science” methods for conducting controlled community trials.

Course Structure:

The course will consist of seminar/discussion classes, lectures, and self study. The course will be enhanced by an online component in Blackboard which will provide resources for accessing class materials including assignments and readings. Students will be required to complete a series of

problem sets, take a midterm and final exam, and develop a brief proposal of an epidemiologic study using a design considered in the course.

Relationship to Public Health Degree Program Goal(s) and Objectives:

This course relates directly to the accomplishment of the educational program goals for the joint epidemiology/biostatistics PhD in the College of Public Health.

Course Materials:

A course packet, including the syllabus, will be distributed on the first day of class to all students who are officially enrolled in the course. The course packet will contain a topic schedule for the course and a listing of the reading assignments. Problem sets will be either handed out in class or posted on Blackboard. Additional course materials will be distributed as the class progresses.

There is one required text for the class and several recommended texts (see below). The texts for the course may be purchased at the Medical Center bookstore or the Kennedy Bookstore (405 S. Limestone). Additional reading materials will either be on reserve in the College of Public Health student lounge or available through Blackboard.

Required Textbook:

Kelsey, J.L., Thomson, W.D. and Evans, A.S. (1996). *Methods in Observational Epidemiology*. Oxford University Press, New York.

Recommended (optional) Textbooks:

Szklo, M and Nieto J. *Epidemiology: Beyond the Basics* (2003). Jones and Bartlett Publishing.

Required Readings (other than text):

Required readings from journal articles, manuscripts, and other documents are listed in the daily assignments. Most of the journal articles for readings will be on reserve in the Department of Epidemiology graduate student area (room 209). Some of these are available as electronic documents in Blackboard.

In addition, we have highlighted (in the assignments) those readings for which articles are available electronically from the e-journals at the medical library (www.mc.uky.edu/medlibrary/resources/ejournals/). Students are responsible for securing their own copies of the readings and reviewing the materials prior to the class.

Evaluation:

Assignments and Tests	Points
Mid-term examination	200
Problem Sets (4) 100 points for each.	400
#1 Confounding in case control studies	100
#2 Assessing measurement error	100
#3 Sample size estimation in study design	100
#4 Improving sensitivity in study designs	100
Class reading discussion lead and brief paper	100
Final Exam	200
TOTAL	900

Letter grades for the course will be assigned on a percentage basis (as given below) for the student's total score as a percentage of the total number of points possible for the course.

Grade	%	Points (3 credit)
A	90-100	810-900
B	80-89	720-809
C	70-79	630-719
E	60-69	≤629

Midterm exam:

There will be a take-home mid-term exam. The exam will emphasize material covered in the assigned readings, lectures, and assignments. The mid-term will cover material considered until TBA date. The midterm exam is expected to be the student's own work.

Reading discussion and class participation.

Students enrolled in the class are required to lead a discussion of the reading materials for a given class. This requires that he/she is well prepared in having read the assigned literature and has prepared a series of questions or other activities for generating a discussion on the reading materials. A short presentation of major issues, controversies, or the "basics of the technique" may be presented to the class. It's an opportunity to be creative. A schedule will be established at the beginning of the semester for students leading the discussion.

Problem Sets:

The problem sets are due on the dates indicated below. The assignments involve applied computations relevant to epidemiologic study design. The assignments must be completed and handed in on the due date. The assignments must be a student's own work (i.e. each student must turn in a completed assignment) but students are encouraged and allowed to work together in solving the problems and assisting each other with the exercises. **Points will be deducted for problem sets which are submitted after the due date.** Problem sets will be discussed in the class.

Number	Topic	Due Date
Set #1	#1 Confounding in case control studies	TBA
Set #2	#2 Assessing measurement error	TBA
Set #3	#3 Sample size estimation in study design	TBA
Set #4	#4 Improving sensitivity in study designs	TBA

Study proposal:

This project should generally follow and use the format of the PHS 398 forms and include (at minimum) the following sections: Introduction, Specific Aims, Brief Literature Review, Study Design, Measures Used, Data Analysis, Strengths and Limitations, and References. The length of the final document should be 20-25 pages and should include at least 15 references. Students are encouraged to research current funding opportunities for ideas on topics. (Details are posted on Blackboard site for the course).

Final exam:

There will be a take-home final exam. The final exam will cover material in the assigned readings, lectures, and assignments for the entire course but emphasize the topics following the midterm exam. The test will be given to the class on or before December 4 and need to be submitted by December 11 at 5:00 pm.

Guidelines for the Use of Blackboard as a Supplement to the Course:

Blackboard 7 is comprehensive and flexible e-learning software platform that delivers a course management system for online learning at the University of Kentucky. The system can be accessed via the internet at the following website (<http://elearning.uky.edu/>).

During the beginning weeks of the course, students can obtain a user name and password for accessing the course materials related to EPI 714. These materials include copies of the syllabus and assignments, access to electronic datasets, and other readings and course materials. In addition, Blackboard provides access to websites related to the content of the course.

Since the class only meets once per week, the Blackboard environment will permit students to discuss problems and assignments with each other and will allow the instructor to make general announcements to the class through the announcements frame or the e-mail facility. It is recommended that you check in at Blackboard at least once early in the week prior to class for any announcements relevant to the upcoming class.

This portion of the course is new and still under development. Your comments and insights related to the web-based adjunct to the class will be much appreciated during the semester.

Topic Outline:

Class	Month	Date	Topic	Faculty
1			Ecologic studies: Design of studies using routinely collected data. <ul style="list-style-type: none"> • Sources of data (focus on state) • Data linkage 	TBA
2			Approaches to the analysis of mortality data: trends and issues with small numbers.	TBA
3			Methods of Sampling: Part 1 <ul style="list-style-type: none"> • Simple random sample • Systematic sampling • Stratified sampling • Cluster sampling / Multistage sampling 	TBA
4			Methods of Sampling : Part 2 <ul style="list-style-type: none"> • Applications with NHANES / BRFSS • Sample weighting 	TBA
5			Survey Research and cross-sectional studies <ul style="list-style-type: none"> • Analysis of survey data • Presentation of survey graphics 	TBA
6			Case control studies <ul style="list-style-type: none"> • Principles of case / control selection • Matching • Bias in case control studies 	TBA
7			Exposure assessment I. <ul style="list-style-type: none"> • Questionnaire development • In-person and telephone surveys 	TBA
8			Exposure assessment II. <ul style="list-style-type: none"> • Measurement of occupational exposures • Development of job exposure matrices • Measurement of biologic markers • Quality control issues : sample processing 	TBA

9			Measurement Error <ul style="list-style-type: none"> • Misclassification • Correcting for measurement error • Multiple measurements 	TBA
10			Cohort Studies I. <ul style="list-style-type: none"> • Planning and execution • Comparison group selection • Diagnostic criteria for outcome 	TBA
11			Cohort Studies II. <ul style="list-style-type: none"> • Nested case control • Case cohort design • Case cross-over design 	TBA
12			Data management issues <ul style="list-style-type: none"> • Study documentation • Participation rates • Missing values issues • Statistical software 	TBA
13			Community based participatory research	TBA
14			Clinical studies <ul style="list-style-type: none"> • Using the resources of the GCRC • Patient population issues 	TBA
15			Molecular / genetic epidemiologic studies <ul style="list-style-type: none"> • Applications of biologic markers • Criteria for evaluating biologic markers 	TBA
16			Proposal preparation / IRB / Ethical issues	TBA

The lecture schedule is subject to change depending on the schedules of faculty. Students will be given notice in the event that a change needs to be made to the schedule.

Summary of Important Dates:

Problem Set # 1	TBA
Problem Set # 2	TBA
Midterm exam due	TBA
Problem Set # 3	TBA
Problem Set # 4.	TBA
Study proposal	TBA
Final exam.	TBA

Policy on absences and late submittal of work:

Students are expected to attend all classes but are not required to do so in order to pass the class. Although attendance is not required and does not serve as a criterion for a grade in the course, examinations may include materials not covered in the texts, readings, or problem sets. Additionally, a point assignment is given for class participation.

Students are expected to take the examinations on the day scheduled in the syllabus. Students who cannot take the examination on the scheduled day must have an excused absence (illness of student or family member, death of family member, university sponsored trip, etc.) as defined in the *Student Rights and Responsibilities* handbook. Students should inform the faculty in advance of the examination if a problem exists with respect to taking the exam on the designated day. Students will be given the opportunity to make up missed work or exams in the event of excused absences. Students are entitled to excused absences for the purpose of observing their major religious holidays.

It is expected that all work submitted for a grade in the course be the work of the individual student. Students are allowed and encouraged to collaborate on assigned problems and problem sets for the course but must submit their own work. Students are encouraged to review sections 6.3.1 on plagiarism and 6.3.2 on cheating in the *Student Rights and Responsibilities* handbook.

Incomplete or “I” grades:

It is at the discretion of the faculty member to assign an 'I' grade at the students request. The student and faculty should agree on (1) what is needed to complete the course requirements to be assigned a final letter grade, and (2) faculty and student should agree on the time frame to complete this work. Please be aware that the faculty ARE NOT REQUIRED to give the student the entire 12 month period to complete the work. In fact, for this course, it is assumed that any necessary extensions needed to complete the work will be short and essentially equivalent to the amount of time that the student could not work on the assignments due to illness, family emergency, or other circumstances. The faculty member would work with the student in developing a time frame which is appropriate for the situation and manageable for both the faculty and student schedules. This will be agreed to in writing by both the student and faculty. Students are strongly encouraged to complete all assignments in the given semester as the policy to assign an “I” is at the discretion of the faculty member and will only be applied when circumstances are warranted.

Enabling Accommodations:

If you have a documented disability that requires academic accommodations, please see me during scheduled office hours. In order to receive accommodations in this course, you must provide me with a letter of accommodation from the Disability Resource Center. If you have not already done so, please register with the Disability Resource Center for the coordination of campus disability services.

Key Periodicals and Journals:

Consulting these journals will be helpful when searching for articles.

Public Health Reports
American Journal of Public Health
American Journal of Epidemiology
American Journal of Industrial Medicine
New England Journal of Medicine
Journal of the American Medical Association (JAMA)
Morbidity and Mortality Weekly Reports (MMWR)
Archives of Environmental Health
Journal of Occupational Medicine
Epidemiology

Supplemental Textbooks with a biostatistics / data analysis orientation:

Hatcher, L., & Stepanski, E.J. (1994). A step-by-step approach to using the SAS System for univariate and multivariate statistics. Cary, NC: The SAS Institute, Inc.

Munro, B.H., & Page, E.B. (1997). Statistical methods for health care research (3rd Ed.). Philadelphia: J.B. Lippincott.

Abramson, J.H. (1994). Making sense of data (2nd Ed.). New York: Oxford University Press.

Jaeger, R.M. (1990). Statistics: A spectator sport (2nd Ed). Thousand Oaks, CA: Sage.

Kanji, G. (1999). 100 statistical tests. Thousand Oaks, CA: Sage.

Krishnamwity, G., Kasovia-Schmitt, P., & Ostroff, D. (1995). Statistics: An interactive text for the health and life sciences. Boston: Jones and Bartlett.

Matthews, D.E., & Farewell, V.T. (1988). Using and understanding medical statistics (2nd Revised Ed.). New York: Karger.

Pedhazur, E.J. (1982). Multiple regression in behavioral research (2nd Ed.). Fort Worth, TX: Holt, Rinehart, and Winston, Inc.

Tabachnick, B. G., & Fidell, L.S. (1989). Using multivariate statistics (2nd Ed.). New York: Harper Collins.

Vogt, W. P. (1999). Dictionary of statistics & methodology: A nontechnical guide for the social sciences (2nd Ed.). Thousand Oaks, CA: Sage.

Wallgren, A., Wallgren, B., Person, R., Jorner, U., & Haaland, J. (1996). Graphing statistics & data. Thousand Oaks, CA: Sage.

Wassertheil-Smoller, S. (1995). Biostatistics and epidemiology: A primer for health professionals (2nd Ed.). New York: Springer-Verlag.

Wright, D. (1996). Understanding statistics: An introduction for the social sciences. Thousand Oaks, CA: Sage.

Supplemental Textbooks with an epidemiology orientation:

Principles of Epidemiology: An Introduction to Applied Epidemiology and Biostatistics. 2nd Edition (1992). US Department of Health and Human Services, Centers for Disease Control and Prevention.

Hennekens, Charles H and Buring, Julie E. (1987) *Epidemiology in Medicine*. Little Brown and Company. Boston.

Streiner, David L. & Norman, Geoffrey R. *PDQ Epidemiology* (2nd Edition). Mosby Publishers.

Rose, Geoffrey (1992). *The Strategy of Preventive Medicine*. New York. Oxford University Press.

Lilienfeld, David E. and Stolley, Paul D. (1994). *Foundations of Epidemiology*. 3rd Edition. Oxford University Press.

Last, John M. (1995). *A Dictionary of Epidemiology*. 3rd Edition. New York. Oxford University Press.

Mausner, J.K. and Kramer S. (1985). *Mausner & Bahn: Epidemiology—An Introductory Text*. 2nd Edition. WB Sanders Co., Philadelphia.

Kelsey, J.L., Thomson, W.D. and Evans, A.S. (1996). *Methods in Observational Epidemiology*. Oxford University Press, New York. [Extremely useful explanations of issues involved in case-control, retrospective, and prospective studies. A good discussion of matching, stratification, and design issues.]

Abramson, J.H. (1988). *Making Sense of Data: A Self-Instruction Manual on the Interpretation of Epidemiological Data*. Oxford University Press, New York.

Fletcher, R.H., Fletcher, S.W., Wagner, E.H. (1988). *Clinical Epidemiology: The Essentials*. 2nd Edition. Williams and Wilkins, Baltimore.

Fleiss, J.L. (1982). *Statistical Methods for Rates and Proportions*, 2nd Edition. New York: John Wiley and Sons. [An excellent second-level statistics text concerned with the analysis of categorical data.]

Rothman, K.J. (1986). *Modern Epidemiology*. Boston: Little, Brown. [An advanced text that covers both design and statistical issues. The focus is on observational epidemiologic studies and is directed more toward the researcher than the clinician.]

Kleinbaum, D.G., Kupper, L.L. and Morgenstern, H. (1982). *Epidemiologic Research: Principles and Quantitative Methods*. Belmont, CA. Wadsworth. [An advanced text primarily for those conducting observational epidemiologic research.]