

**SAINT LOUIS UNIVERSITY  
SCHOOL OF PUBLIC HEALTH  
DEPARTMENT OF COMMUNITY HEALTH  
DIVISION OF EPIDEMIOLOGY**



**EPI-601-01  
ADVANCED EPIDEMIOLOGY METHODS  
Spring Semester 2008**

**Syllabus**

**Meeting Dates and Times:**

Jan 22, 29, Feb 5, 12, 19, 26, Mar 4, 11, Apr 1, 8, 15, 22, May 6 (8:30 -11:00 a.m.)  
April 29 (9:00 a.m. – 3:00 p.m.)

**Location:**

Salus Center, Classroom 1501

**Instructors:**

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**Office Hours:**

After class and by appointment

## **Course Overview**

Introduction: All students pursuing the Master of Public Health or Master of Science in Public Health degree with a concentration in epidemiology at Saint Louis University are required to complete the epidemiology capstone course. This course provides students with the opportunity to complete an epidemiologic study during a 15-week period with guidance from the epidemiology faculty who serve as mentors. During the course, all students will 1) select a research topic and mentor, 2) review the scientific literature review to learn more about the research topic, 3) develop a research proposal to address the aims of the proposed research study, 4) design and analyze an epidemiologic study to address the research hypothesis, and 5) present the results of their epidemiologic study to the School of Public Health faculty. Prerequisites for the course include the successful completion of EPI-501 (Epidemiology Methods I), EPI-502 (Epidemiology Methods II), BST-500 (Principles of Biostatistics), BST-510 (Introduction to General Linear Modeling), and BST-520 (Survival Analysis). Students are also expected to have completed or to be enrolled in BST-521 (Categorical Data Analysis).

Purpose: The purpose of this course is to provide each student with the opportunity to use the skills that represent the core disciplinary and cross-cutting competencies expected of all students completing the requirements for the Master of Public Health or Master of Science in Public Health degree with a concentration in epidemiology at Saint Louis University.

## **Course Description**

Course Format: Students will work in pairs with a faculty mentor to evaluate the potential risk factors for specific diseases or health behaviors. Each student team will design and analyze a cohort, case-control, or cross-sectional study using data from the SLU epidemiology faculty. Each student will sign a confidentiality agreement before obtaining the required data for their student project. Students who choose to publish their work must obtain IRB and HIPAA approval from Saint Louis University before submitting their manuscript, and must submit their manuscript for publication within one year of completing the course. Student not complying with these requirements will forfeit authorship rights. Furthermore, the mentor will determine the order of co-authorship on all manuscripts.

Each student team will select a topic from the list of hypotheses (Appendix A) provided by the SLU epidemiology faculty. Each team should select alternative topics since a specific topic may be the first choice for more than one team. The student with the lowest number selected randomly during the first class will have first choice of topics in the event of multiple interests. After completing the scientific literature review and formulating the study hypothesis, the team will be given an electronic file containing data with specific covariates from existing databases stored at Saint Louis University or elsewhere. Students will use the most appropriate analytic methods to analyze their data. Each team will present

their study results as an oral presentation and as a written report in the form of a journal article. All written assignments must be typewritten and double-spaced, using times new roman font 12 and one-inch margins. Since the duration of the course is only 15 weeks, a schedule denoting the due dates for specific components of your project is provided (Appendix B). In the past, students have reported spending 10-20 hours per week to complete course assignments. The course instructors will be available for assistance during scheduled class times and by appointment.

#### Student Expectations and Requirements:

- It is very important that you attend all classes. The information needed to master the course objectives will be presented and discussed in class. Students who miss more than one class will be asked to re-take the course at a later time.
- It is very important that you complete the assigned readings before or shortly after each lecture. The readings have been selected to complement the lectures and will provide additional examples for applying basic epidemiologic and biostatistic methods.

#### Instructor / Mentor Expectations and Requirements:

- We will come to class prepared, organized, and enthusiastic.
- We will critique all assignments and give you our comments at the beginning of the next class session.
- We will be available during normal business hours to answer any questions that you may have about the course. If your schedule precludes you from meeting with us during normal business hours, we will make every effort to meet with you at times that may be more convenient for you. Please feel free to contact us by telephone or email to discuss any issues concerning the course.
- We retain the right to change the order of the lectures and the content of the class to meet the needs of the majority of students enrolled in the course.

**Grading Determination and Policy:** The final grade for each team will be based on timely completion of weekly assignments (20 points total) and the overall quality of the in-class oral presentation (40 points) and final report (40 points) for the team's research project. Assignments and reports completed individually or submitted after assigned due dates will not be accepted. Final grades will be given in accordance with guidelines from the Graduate School.

<u>Grades</u>	<u>Total Points</u>	<u>Grades</u>	<u>Total Points</u>
A	93-100	B-	80- 82
B+	90- 92	C	73- 79
B	83- 89	F	<73

**Academic Integrity Policy:** Consistent with the decision reached by the Department of Community Health faculty in spring 2001, all students enrolled in MPH or PhD program courses are expected to abide by and uphold the Saint Louis University Graduate School's Policy on Academic Integrity and Ethics. This policy is reprinted below:

*The University is a community of learning; its effectiveness requires an environment of mutual trust and integrity. As members of this community, students share with Faculty and Administrators the responsibility to maintain this environment. Academic integrity is violated by any dishonesty in submitting for evaluation assignments, tests, research, reports, etc., required to validate the student's learning. In a case of clear indication of such dishonesty, the Faculty member or Administrator has the responsibility to apply sanctions to protect the environment of integrity necessary for learning.*

*Although not all forms of academic dishonesty can here be listed, the instances listed below should be seen as actions that not only violate the mutual trust necessary between Faculty and students, but they also undermine the validity of the University's evaluation of students and take unfair advantage of fellow students. Soliciting, receiving, or providing any unauthorized assistance in the completion of any work submitted toward academic credit is dishonest.*

*Examples of academic dishonesty would be copying from another student, copying from a book or class notes during a closed-book exam, submitting materials authored by or editorially revised by another person but presented as the student's own work, copying a passage or text directly from a published source without appropriately citing/recognizing that source, taking a test or doing an assignment or other academic work for another student, or securing or supplying in advance a copy of an examination without the knowledge or consent of the Instructor.*

*Any clear violation of academic integrity will be met with sanctions. In a case of dishonesty within a course, the Instructor may assign an appropriate grade and/or recommend further sanctions to the Dean. The Dean may, in a clearly serious instance of apparent or alleged academic dishonesty, appoint and ad hoc committees to hear, judge, render an opinion, and, if warranted, recommend sanctions. The Dean is responsible for the final decision and notifications of all associated parties.*



## ADVANCED EPIDEMIOLOGY METHODS

### Appendix A EPI-601 Topics

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#### Epidemiology Projects

1. Prior studies have shown that obesity rates are rapidly rising and are associated with a number of individual and environmental factors. To date, few studies of these associations have been conducted in developing countries such as Brazil. Understanding the association between environmental factors and obesity will assist public health practitioners in developing interventions. In 2007, we collected data in the Recife physical activity survey from 2,046 Brazilian adults. Is the neighborhood environment associated with obesity among Recife adults?

(Mentor: Ross Brownson)

2. Short sleep duration has adverse effects on physical health and may influence body weight. In the United States, average sleep duration was 6.9 hours per night according to a recent national survey. Research has shown that adolescents receive less sleep than adults and younger children despite their greater sleep needs. Using data from the National longitudinal Study of Adolescent Health, this study will address the following question: Is short sleep duration associated with overweight/obesity in adolescents over time?

(Mentor: Jen Jen Chang)

3. Smoking and obesity are the leading preventable causes of disease and have been identified by Healthy People 2010 as leading health indicators. While the age- and sex-adjusted prevalence of current smoking in NHANES 1999-2000 was lower with each increasing BMI category (Gregg et al, 2005), other studies using younger samples have reported a negative relationship between smoking and body weight (van den Bree et al, 2004; Zimlichman et al, 2005; Spring et al, 2004). What is the relationship between smoking and overweight/obesity, and does this relationship differ by age?

(Mentor: Alexis Duncan)

4. Mounting evidence suggests that leisure-time physical activity behavior is positively associated with having access to parks and trails (McCormack et al,

2004) and negatively associated with the presence of neighborhood physical incivilities (e.g., graffiti, litter) (Heinrich et al, 2007). Yet, little is known about how these neighborhood characteristics interact to influence physical activity behavior. Is the effect of having access to parks and trails on leisure-time physical activity the same for neighborhoods with low and high levels of physical incivilities?

(Mentor: Christy Hoehner)

5. Prior studies have shown that obesity, which occurs in almost a third of United States adults, increases the risk of pregnancy complications including gestational diabetes, preeclampsia, macrosomia, and cesarean delivery (Rosenberg et al, 2003). A study by Caughey et al. (2007) found that infants born at 40 weeks and beyond have an increased risk of maternal pregnancy complications (operative vaginal delivery, postpartum hemorrhage, and cesarean delivery). Does this increased risk at late gestation occur in obese women versus normal women?

(Mentor: Donna Halloran)

6. Prior studies have shown that more experienced physicians have better outcomes than those with less experience when administering the same medical procedure. A study by Hoehner et al. (2006) reported a lower adverse outcome rate for breech infants delivered by caesarean section at hospitals with higher numbers of deliveries compared to those with fewer deliveries per year. Does the same relationship exist for hospital birth volume and birth injuries among full-term infants?

(Mentor: Terry Leet)

7. The preterm birth (<37 completed gestational weeks) rate in the United States was 12.3% in 2003, which represents a 31% increase in preterm birth since 1981. This increase was primarily due to a greater proportion of infants delivered between 34-36 weeks gestation (Raju et al., 2006). When compared with full-term infants, late preterm (34-36 weeks gestation) infants are three times more likely to die during the first year of life (Tomashek et al., 2007). Are infant mortality trends for late versus full-term infants also influenced by method of delivery, i.e., vaginal versus cesarean section?

(Mentors: Terry Leet and Erol Amon)

8. In women with breast T3 (>5 cm) lesions, there are a significant subset of patients who are node negative despite very large tumors. Little is known about the tumor and patient characteristic differences, or about survival differences, between women with T3 lesions and positive lymph nodes versus women with T3 lesions and negative lymph nodes.

(Mentors: Julie Margenthaler, Donna Jeffe, and Anjali Deshpande)

9. Studies have shown that having diabetes is associated with a 10-20% increase risk of developing breast cancer. It is unclear if diabetes also increases the risk of developing metastases after breast cancer diagnosis based on the same biological pathways. The purpose of this project is to examine the association between diabetes and development of metastases while controlling for confounders (patient characteristics, treatment, stage of diagnosis, and other co-morbid conditions) among women age 66 or older diagnosed with stage I-III breast cancer during 1992-1999 across the United States

(Mentor: Mario Schootman)



## ADVANCED EPIDEMIOLOGY METHODS

### Appendix B Schedule

<u>Date</u>	<u>Topic</u>	<u>Competencies</u>
01/22/08 (TL)	Course overview Select mentor & distribute background information for research question	None
01/29/08 (TL)	Research proposal: Introduction Scientific literature review: Medline / Pubmed demonstration	2,8
02/05/08 (TL)	Human subjects protection <b><u>Due February 12:</u></b> Submit first draft of research proposal	
02/12/08 (AD)	Research proposal: Methods (part 1 – study design, eligibility criteria, covariates, sample size)	1,4
02/19/08 (AD)	Research proposal: Methods (part 2 – multivariate analysis overview: stratified analysis, linear, logistic, log-normal, Poisson, proportional hazards)	1,4
02/26/08 (AD)	Research proposal: Methods (part 3 – analysis, limitations) <b><u>Due March 4:</u></b> Submit second draft of research proposal	1,4

03/04/08 (TL & ME)	Data management: editing, recoding, missing values	9
03/11/08 (TL)	Data management: writing syntax, planning analytic strategy Distribute data sets	9
03/18/08	No class: Spring week	
03/25/08	No class: MPH oral examination week <b><u>Due April 1:</u></b> Submit first draft of results and table 1	
04/01/08 (AD)	Multivariate analysis: Confounding bias	4,6,9
04/08/08 (AD)	Multivariate analysis: Effect modification <b><u>Due April 15:</u></b> Submit second draft of results, tables, and figures	4,6,9
04/15/08 (AD & MS)	Multivariate analysis: Sensitivity analysis <b><u>Due April 22:</u></b> Submit abstract	4,6,9
04/22/08 (AD)	Guidelines: Oral presentations	6,7
04/29/08 (AD & TL)	Oral presentations	6,7
05/06/08 (TL)	Oral presentation review Guidelines: Final report Student evaluations <b><u>Due May 15:</u></b> Submit final report.	6,7

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**Recommended Texts**

- Agresti, A. *An Introduction To Categorical Data Analysis*. Wiley-Interscience; second edition, 2007. ISBN-10: 0471226181, ISBN-13: 978-0471226185
- Allison, PD. *Logistic Regression Using the SAS System: Theory and Application*. Wiley-SAS, 2001. ISBN-10: 0471221759; ISBN-13: 978-0471221753.
- D'Agostino R, Sullivan L, Beiser A. *Introductory Applied Biostatistics*, Thomson, 2006. ISBN: 0-53-442399-X
- Kleinbaum DG. *Survival Analysis: A Self-Learning Text*, Springer, second edition, 2005. ISBN: 0-38-723918-9
- Koepsell TD and Weiss NS. *Epidemiologic Methods: Studying the Occurrence of Illness*. Oxford University Press, 2003. ISBN: 0-19-515078-3
- Kuzma, JW and Bohnenblust, SE. *Basic Statistics for the Health Sciences*, Mayfield Publishing Company, fifth edition, 2005. ISBN-10: 1559349514; ISBN-13: 978-1559349512
- Pagano M and Gauvreau K. *Principles of Biostatistics*, Duxbury Thomas Learning, second edition, 2001. ISBN: 0-534-22902-6