



**Department of Population Health Sciences**

**Epidemiologic Methodology (PHS 798)**

**Spring Semester, 2019**

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**Teaching Assistant:** Rissa Lane (WARF 701)

**Course Description:** Epidemiologic Methodology (PHS 798) is directed to graduate and undergraduate students interested on the investigation of the occurrence and consequences of disease in humans. This course expands on the knowledge and abilities developed in Introduction to Epidemiology (PHS 797). The main emphasis of PHS 798 is on the design and interpretation of epidemiologic studies. The course will include hands-on experience in the evaluation of epidemiologic evidence, the analysis of epidemiologic data, and the discussion of strategies aimed to improve study validity and efficiency. There will be a lab (group homework) for most topics. Labs will be discussed during class time.

**Course Learning Outcomes:** By the end of the course, the student will be able to:

- a) Select, calculate and interpret measures of frequency and measures of effect used in different types of epidemiologic studies
- b) Demonstrate understanding of the rationale behind the design of epidemiologic studies
- c) Identify sources and types of bias in epidemiologic studies
- d) Explain common strategies to prevent and correct for bias in epidemiologic studies.
- e) Conduct a stratified analysis
- f) Evaluate the validity and extrapolability of results from epidemiologic studies

**Credits: 3****How the Credit Hours are Met**

This class meets for two 75-minute class periods each week over the semester and carries the expectation that students will work on course learning activities (reading, writing, problem sets, studying, etc) for about 2 hours out of classroom for every class period. The syllabus includes additional information about meeting times and expectations for student work.

**Grading:** Grades will be based on lab assignments (15%), quizzes (15%), 2 midterm exams (20% each) and a final exam (30%). Grades will be assigned as 90.0-100, A; 85.0-89.9, AB; 80.0-84.9, B; 75.0-79.9, BC; 70.0-74.9, C; etc.

**Exams, Quizzes, Papers & Other Major Graded Work**

There will be two midterm exams and one final exam. The final exam will be cumulative. There will be a quiz the class day following a lab discussion.

**Homework & Other Assignments**

Readings should be completed prior to the start of the corresponding lecture. Homework (labs) is due on the day following the discussion of the corresponding lab problem and must be handed in to the instructor or left in the instructor's office (WARF 703), if needed, in paper format. Students will be randomly assigned to lab groups and each student must individually contribute to the lab report from his/her group. Students should expect to be individually asked to participate in the discussion of the lab problems.

**Policies:**

- Readings should be completed prior to the start of the corresponding lecture.
- Homework is due on the day following the discussion of the corresponding lab problem and must be handed in to the instructor or left in the instructor's office (WARF 703), if needed, in paper format.
- Unless there is an exam, there will be a quiz about each lab the class day following the lab discussion.
- Students are encouraged to discuss course contents and lab problems with each other.
- Students will be randomly assigned to lab groups and each student must individually contribute to the lab report from his/her group.
- Students should expect to be individually asked to participate in the discussion of the lab problems.

- Lecture handouts, readings, and homework assignments will be available through Canvas:  
<https://canvasinfo.wisc.edu>
- Cell phones **MUST** be turned off during lectures and lab discussions.

### **Instructor Availability**

**Office hours:** LB (WARF 703)      Tuesday & Thursday 1:00 to 2:00 pm or e-mail me for an appointment.

**Recommended Textbooks:** There is no required textbook for this course. The following textbooks are **recommended, not required**. These textbooks include most of the contents that will be covered in PHS798, at the level they will be covered. I suggest you read at least one chapter for each one of these books or any other intermediate Epidemiology textbook, before deciding which one(s) you want to use for this course and buying. You will probably find one of them easier to understand than the others. Readings as well as lecture slides will be provided for each topic, including journal articles or book chapters. Although I do not follow a textbook, I strongly recommend reviewing topics from a textbook and completing the course readings.

- Moyses Szklo, F. Javier Nieto. Epidemiology. Beyond the Basics. 3rd Edition. Jones and Bartlett, Sudbury, MA, 2014.
- Isabel dos Santos Silva. Cancer Epidemiology: Principles and Methods. International Agency for Research on Cancer (IARC), Lyon, France, 1999.
- Harvey Checkoway, Neil Pearce, David Kriebel. Research Methods in Occupational Epidemiology, 2<sup>nd</sup>. Edition. Oxford University Press, New York, 2004.
- Author(s): Rothman KJ, Lash TL, Greenland S. Modern Epidemiology, 3rd Edition. Wolters Kluwer, Philadelphia, 2012

**Online access:** Canvas at <https://canvasinfo.wisc.edu>

**Course schedule:** Tuesdays & Thursdays 11:00 to 12:30 a.m. at Clinical Science Center G5/119

## Lectures and course activities

Date	Day	Topic	Instructor
Jan 22	Tuesday	Introduction	
		Causal effects: The Counterfactual Model	LB
Jan 24	Thursday	Causal effects: The Counterfactual Model	LB
Jan 29	Tuesday	Measures of disease frequency	LB
		Reading: Szklo and Nieto, Ch. 2-3	
Jan 31	Thursday	Measures disease frequency	LB
		Reading: Szklo and Nieto, Ch. 2-3	
Feb 5	Tuesday	Measures of association	LB
Feb 7	Thursday	Lab 1: Measures of disease frequency and measures of association	LB
Feb 12	Tuesday	Study design: Experimental studies	LB
		Reading: dos Santos Silva, Ch. 7	
		<b>Quiz 1 (Epi Measures)</b>	
Feb 14	Thursday	Study design: Experimental studies	LB
		Reading: dos Santos Silva, Ch. 7	
Feb 19	Tuesday	Lab 2: Experimental studies	LB
Feb 21	Thursday	Study design: Cohort studies	LB
		<b>Quiz 2 (Experimental studies)</b>	
		Reading: Szklo and Nieto, Ch. 1, p. 23-55	
		* dos Santos Silva, Ch. 8	
		* Checkoway, Ch. 5	
Feb 26	Tuesday	Study design: Cohort studies	LB
Feb 28	Thursday	Lab 3: Cohort studies	LB
March 5	Tuesday	<b>1<sup>st</sup> Exam (up to and including cohort studies)</b>	
March 7	Thursday	Study design: Case-control studies	LB
		Reading: Szklo and Nieto, Ch. 1, p. 23-55	
		* dos Santos Silva, Ch. 9	
		* Checkoway, Ch. 6	

March 12	Tuesday	Study design: Case-control studies Reading: Szklo and Nieto, Ch. 1, p. 23-55 * dos Santos Silva, Ch. 9 * Checkoway, Ch. 6	LB
March 14	Thursday	Lab 4: Case-control studies	LB
<b>March 18-22</b>		<b>Spring Break</b>	
March 26	Tuesday	Assessing validity: Confounding Reading: Szklo and Nieto, Ch. 5, p. 153-184 <b>Quiz 3 (Case-control studies)</b>	LB
March 28	Tuesday	Assessing validity: Confounding Reading: Szklo and Nieto, Ch. 5, p. 153-184	LB
April 2	Tuesday	No class	
April 4	Thursday	Assessing validity: Information bias Reading: Szklo and Nieto, Ch. 4, p. 109-152	P Peppard
April 9	Tuesday	Assessing validity: Information bias Reading: Szklo and Nieto, Ch. 4, p. 109-152	P Peppard
April 11	Thursday	Assessing validity: Selection bias Reading: Szklo and Nieto, Ch. 5, p. 153-184	LB
April 16	Tuesday	Assessing validity: Selection bias Reading: Szklo and Nieto, Ch. 5, p. 153-184	LB
April 18	Thursday	Lab 5: Assessing Biases	LB
April 23	Tuesday	<b>2<sup>nd</sup> Exam (up to and including selection bias)</b>	
April 25	Thursday	Interaction Reading: Szklo and Nieto, Ch. 6, p. 185-226	LB
April 30	Tuesday	Interaction Reading: Szklo and Nieto, Ch. 6, p. 185-226	LB
May 3	Thursday	Improving study efficiency Reading: Rothman KJ, Greenland S, Lash T Modern Epidemiology 3rd Ed. 2008 Ch. 11.	LB
May 7	Tuesday	Review Reading: Szklo and Nieto, Ch. 7. p. 229-312	LB

May 9      Thursday

## **Final Exam (cumulative)**

\* Read one of the two.

### **Academic Policies**

#### **Academic integrity**

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to

<https://conduct.students.wisc.edu/academic-integrity/>

#### **Accommodations for students with disabilities**

**McBurney Disability Resource Center syllabus statement:** The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA.

<http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>

#### **Diversity and inclusion**

**Institutional statement on diversity:** Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background - people who as students, faculty, and staff serve Wisconsin and the world. <https://diversity.wisc.edu/>