HSSP100B2
Introduction to Epidemiology, Biostatistics and Population Health
Mara Eyllon, Spring, 2016
Monday & Wednesday, 2:00-3:20 PM

Professor: Mara Eyllon
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Office hours: Wednesday 12:30-1:30 or by appointment after class on Wednesdays

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Office hours: Monday 12:00-1:30

Peer Assistant: Alexa Myers, HSSP BA Candidate
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Office hours: TBA

Course Meeting Location:

Designation: SS, QR, EL*

COURSE DESCRIPTION
This course offers an overview of the field and foundational tools of epidemiology. Students will learn the fundamental concepts and methods used by epidemiologists in order to apply epidemiologic principles to public health, medicine, policy, and related fields.

Epidemiology is the study of health and illness at the population level, as well as the scientific foundation for public health. The primary goal of epidemiology is to understand how risk factors and disease outcomes are distributed across groups of people. Epidemiological inquiry spans across a vast range of illnesses and other maladies including chronic, communicable, genetic and psychiatric illnesses, and injuries and violence. Epidemiology is used to study how societal, environmental, genetic, and biological risk factors relate to illness, as well as the complex interactions among these factors. As the scientific foundation for public health, epidemiologic research can be used to inform the design of interventions and policies to promote health and wellbeing among entire populations. Unlike clinical medicine, epidemiology focuses on shifting the overall distribution of disease within a population rather than on individual outcomes.

Our overall course objective is to enable students to become informed and intelligent consumers of epidemiologic literature and to provide a basis for further studies and careers in health and public health-related fields. Course concepts build on each other, and students will be expected come prepared for class and to stay up to date on lectures, assignments and readings. Furthermore, students are expected to engage in course lectures, discussions and activities through thoughtful participation.
This course requires quantitative reasoning, critical thinking skills, and written and verbal communication skills. Students will learn the principle methods for measuring and comparing disease occurrence and risk factors among populations, as well as how to interpret these measures to inform public health practice. Biostatistics are an important tool used by epidemiologists and basic biostatistical principles will be introduced throughout the course as appropriate. Critical thinking will be required in order to interpret quantitative findings and their implications to promote health equity and reduce health disparities among populations. Course assignments will reflect the multifaceted nature of this course. Assignments will require a mix of quantitative reasoning, calculations and clearly written, critical interpretations of key findings and concepts.

Course Objectives:
- Distinguish basic concepts and methods of descriptive and analytic epidemiology.
- Apply basic epidemiologic, biostatistical, and population health concepts.
- Develop the ability to critically analyze and critique epidemiologic studies.
- Learn to critically interpret and evaluate epidemiologic evidence in order to inform the development of academic projects, public health interventions, and policies.
- Foster curiosity about the distribution of illness and risk factors across populations and the ways in which society, environment, and biology relate to illness.
- Demonstrate high levels of professionalism with peers and guest lecturers through active participation in lectures and group activities.

This course is a core requirement in the “Health: Science, Society and Policy” (HSSP) major and minor and fulfills the university quantitative reasoning requirement. It is also designated as an experiential learning course and is a School of Social Science distribution requirement.

Experiential Learning
HSSP 100b is designed to be experiential in that assignments and classroom exercises will engage students in the methodologies employed by epidemiologists, as well as their application to diverse issues and allied fields. Additionally, students will become intelligent consumers of epidemiologic literature including research papers, briefs, and news and media stories. By the end of this course, students will be able to use their understanding of epidemiology in order to: 1) understand underlying study designs; 2) interpret epidemiologic findings; 3) evaluate the quality of epidemiologic evidence; 4) critically interpret the implications of findings for further research and practice. To this end, classroom discussion is an integral component of the course and will be used to give students the opportunity to delve into topics and ask questions. Students will also learn how concepts covered in class apply to the world beyond the classroom and enable students to become informed and critical consumers of news and media covering public health topics. The final assignment will be a study critique in order to apply material covered in class to critically evaluate a piece of research.

Course Material:
**Book:** Friis, Robert H., Epidemiology 101, Jones and Bartlett, 2010
The book may be obtained at the bookstore or your favorite bookstore - and is also on reserve at the library and online through the Brandeis library.

**LATTE:** All course materials will be posted on LATTE including the syllabus, assignments, lecture slides and activities. In the event of a course cancellation, instructions for making up class will be posted in LATTE in lieu of class.
**Supplemental Readings:**
Students may also wish to consult any of the following epidemiology texts:

- Gordis, Epidemiology, 5th edition, 2013
- Merrill, Introduction to Epidemiology, Jones and Bartlett, 2011
- Merrill, Fundamentals of Epidemiology and Biostatistics, Jones and Bartlett, 2013
- Aschengrau and Seage, Essentials of Epidemiology in Public Health, Jones and Bartlett, 2008.
- Gordis, Epidemiology, 5th edition, 2013

**CLASS PERFORMANCE AND EXPECTATIONS:**

**Classroom etiquette:**

- No cell phone use during class
- No laptop or Ipad use in class. If you **must** use a computer or Ipad to take notes please notify the professor as soon as possible for permission to use your device in class. Under no circumstances may a student with explicit consent use their device for any purpose other than to take notes.
- Please let the TA and professor know if you’ll be absent or late 24 hours before the beginning of the class, unless unexpected circumstances arise.
- Students are expected to participate actively in class by engaging in discussion, asking thoughtful questions, and listening to their peers.
- All homework assignments must be submitted prior to the start of class on the day on which they are due.
- In the event that you are not able to complete an assignment on time or are unable to attend class on the day of an exam, you **must contact the professor at least 48 hours before in order to make plans**. Late assignments without a documentation of excuse are subject to a half grade deduction per each day late.

**COURSE REQUIREMENTS**

**Assignments and participation:**

*Overview of Course Assignments: (details below)*

- Homework assignments (6)
- In-class discussion/group activities - Participation with guest speakers
- CITI completion
- Exams (3)

**Grading:**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework 1-5: 6% each</td>
<td>30%</td>
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<td>Homework 6:</td>
<td>15%</td>
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<tr>
<td>Exams: 3 exams worth 15% each</td>
<td>45%</td>
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<tr>
<td>Class participation:</td>
<td>10%</td>
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Participation:

Students are expected to participate actively and with professionalism in the course. Active participation includes, but is not limited to: asking thoughtful and critical questions in class; responding to questions posed by professor; working with peers during in class group assignments; asking thoughtful questions to guest speakers; attending office hours when help is needed. Demonstrating professionalism means coming prepared to class; actively listening; and showing utmost respect to your peers, teachers, and guest lecturers for their time, ideas, expertise and experience. Your participation grade will be based on your in class engagement (discussion, comments, questions, analyses), group activity participation, engagement with guest lecturers, LATTE posts, and completion of the CITI training.

Assignments:

*Homework assignments:* Students will complete 6 homework assignments throughout the duration of the course. Homework assignments are an opportunity to practice course concepts including: calculations, interpretations of epidemiologic findings and concepts and critical thinking and analysis of topics covered in class. *Students may consult with their peers in completing assignments, but all write ups must be done independently.* Each student in the group is expected to turn in their own assignment and to list the members of the group at the top of the assignment***. Failure to indicate all collaborators will be treated as plagiarism. You and your collaborators may receive different grades on assignments as each student will write up their final assignment independently and final responses may be different. *All steps taken to complete all calculations must be included to receive full credit.* This will give the TA the opportunity to see where a mistake may have been made and give appropriate feedback. A correct answer with no work shown will not receive any credit.

***We recommend attempting the homework assignments independently, attending office hours and consulting the text book and slides before working with a group. Students who pursue these opportunities and resources diligently have much higher success rates in the course.

*Homework:* Must be type written in standard font and size (e.g. Times New Roman or Arial font; size 11 or size 12) with one inch margins.

*Exams:* Students will take three in-class exams. Each exam will be cumulative and any material from prior in the semester may be included. However, special emphasis will be given to newer concepts and methods. The final exam is cumulative and will be administered on the last day of class. Exams are closed book but students may bring an 81/2 x 11 inch page of notes and a calculator *(phone calculators are not permitted)* to the exam. Students who elect to use a notes page will be expected to submit the notes page with their name alongside their exam.

*Short Essay:* Due first day of class **Wednesday January 18.** In this essay you should:

- Describe why you are part of the HSSP program
- What you hope to learn this semester in HSSP100B
- How you hope the course will prepare you for future academic and professional endeavors.
- A brief statement at the end of the narrative describing something related to epidemiology or public health that you recently saw (in a movie, show), read (article,
**Epi in the news:** In order to keep the class current, students will be responsible for posting 2 ‘epi in the news’ posts on the LATTE forum “epi in the news”. These posts may include links to articles, films, workshops, speaker events, etc. that are relevant to course material. Students are expected to review posts each week in order to participate in class discussion regarding posts.

**CITI training:** Complete CITI training course and upload certificate by Monday, March 24th at 2:00 PM. Select appropriate from three options below:

1) **If you have not taken the CITI course previously,** you may choose the biomedical or social and behavioral "track". When you are done, submit the completion certificate via LATTE. You should select: a) Responsible Conduct of Research; b) Human Subjects Research (social behavioral)

2) **If you have taken the course before,** but your certificate has expired, you may follow the directions to take a "refresher course" of whichever type you have previously completed. When you are done, submit the completion certificate via LATTE.

3) **If you have previously completed the course and the certificate is not expired,** submit the certificate of completion via LATTE.

**Note:** The syllabus is subject to updates and alterations throughout the semester. Additional readings may be announced closer to assigned dates. All updates will be announced in-class, via email/and or posted to LATTE. **It is your responsibility to check LATTE regularly for the most update to date version of the course syllabus and material.**

**Disability Status**
If you are a student with a documented disability on record at Brandeis University and wish to have an accommodation made for you in this class, please see me immediately (within the first two weeks of the start of class) in order to make appropriate arrangements.

**Academic Integrity**
Academic integrity is central to the mission of educational excellence at Brandeis University. Violations of University policy on academic integrity may result in failure in the course or on the assignment, and could end in suspension from the University. **If you are in doubt about the instructions for any assignment or exam in this course it is your personal responsibility to ask for clarification.**
Please make sure to read the full Brandeis academic integrity site. [http://www.brandeis.edu/svpse/academicintegrity/](http://www.brandeis.edu/svpse/academicintegrity/)

**Plagiarism:** Each student is expected to turn in work completed independently, except when assignments specifically authorize collaborative effort. **Collaborations must be noted in writing on the first page of any assignment in which collaborations are permitted. Failure to note collaborations will be considered plagiarism.** You must cite sources with proper citation whenever they are used, whether those sources are published or unpublished (e.g., internet web sites). Assignments that appear to be instances of plagiarism may be returned to the student for revision, considered incomplete, or reported to the university, at the discretion of the professor. Such behavior will also be considered a serious deficiency in grading pertaining to the particular assignment. **If you are unsure about what constitutes plagiarism it is your personal responsibility to ask for clarification.**

**Useful epidemiology and public health references/links**
• What is Public Health?
https://www.apha.org/what-is-public-health

• What is epidemiology?
http://yes-competition.org/yes/epidemiology-resources.html

• YES Competition Epidemiology Glossary
http://yes-competition.org/yes/epidemiology-resources/glossary.html

• YES Competition Links to Epidemiology Resources
http://yes-competition.org/yes/epidemiology-resources/links.html

• Epidemiology as a Liberal Art
http://yes-competition.org/yes/epidemiology-resources/epidemiology-liberal-art.html

• Epiville (including glossary)
http://epiville.ccnmtl.columbia.edu/

• Study Design 101
http://himmelfarb.gwu.edu/tutorials/studydesign101/

• Overview of Analytic Studies

• E-source, online behavioral and social science research text
http://www.esourceresearch.org/
## SCHEDULE OF LECTURES AND ASSIGNMENTS

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<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topic</th>
<th>Assignment</th>
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<td></td>
<td><strong>Unit 1: History of Epidemiology, Basic Concepts and Measures</strong></td>
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<tr>
<td>1</td>
<td>Wed, Jan 18</td>
<td>Course overview/Introduction to Epidemiology</td>
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<td>2</td>
<td>Mon, Jan 23</td>
<td>Unit Overview/Descriptive epidemiology</td>
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<td>3</td>
<td>Wed, Jan 25</td>
<td>Measuring disease occurrence</td>
<td>HW #1 due</td>
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<td>4</td>
<td>Mon, Jan 30</td>
<td>Measures of association</td>
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<td>5</td>
<td>Wed, Feb 1</td>
<td>Measures of association, Part II/Screening</td>
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<td>6</td>
<td>Mon, Feb 6</td>
<td>Exam 1 Review Session: Jeopardy</td>
<td>HW #2 due</td>
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<tr>
<td>7</td>
<td>Wed, Feb 8</td>
<td>Group case study/Review</td>
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<td>8</td>
<td>Mon, Feb 13</td>
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<td>EXAM 1</td>
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<td>9</td>
<td>Wed, Feb 15</td>
<td>Guest Lecture: Dr. Lindsay Rosenfeld</td>
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<td></td>
<td>Mon, Feb 20</td>
<td>No class: midterm recess</td>
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<td></td>
<td>Wed, Feb 22</td>
<td>No class: midterm recess</td>
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<td><strong>Unit 2: Epidemiologic Study Design</strong></td>
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<td>10</td>
<td>Mon, Feb 27</td>
<td>Experimental studies</td>
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<td>11</td>
<td>Wed, March 1</td>
<td>Observational Studies: Cohort</td>
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<td>12</td>
<td>Mon, March 6</td>
<td>Observational studies: case control</td>
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<td>13</td>
<td>Wed, March 8</td>
<td>Study design challenge: group discussion</td>
<td>HW #3 due</td>
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<td>14</td>
<td>Mon, March 13</td>
<td>Exam 2 Review</td>
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<td>15</td>
<td>Wed, March 15</td>
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<td>EXAM 2</td>
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<td><strong>Unit 3: Interpretation and Critical Review of Epidemiologic Studies</strong></td>
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<td>16</td>
<td>Mon, March 20</td>
<td>Unit overview/evaluating random error</td>
<td>CITI certificate</td>
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<tr>
<td>17</td>
<td>Wed, March 22</td>
<td>Evaluating Bias</td>
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<tr>
<td>18</td>
<td>Mon, March 27</td>
<td>Evaluating confounding and effect modification</td>
<td>HW #4 due</td>
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<tr>
<td>19</td>
<td>Wed, March 29</td>
<td>Association and causality</td>
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<td><strong>Unit 4: Special Topics in Epidemiology</strong></td>
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<td>20</td>
<td>Mon, April 3</td>
<td>How to critique a study</td>
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<td>21</td>
<td>Wed, April 5</td>
<td>Guest Lecture 2</td>
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<td>Mon, April 10</td>
<td>Passover and Spring Recess</td>
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<td>Wed, April 12</td>
<td>Passover and Spring Recess</td>
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<td></td>
<td>Mon, April 17</td>
<td>Passover and Spring Recess</td>
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<td>22</td>
<td>Wed, April 19</td>
<td>Ethics in public health research</td>
<td>HW #5 due</td>
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<tr>
<td>23</td>
<td>Mon, April 24</td>
<td>Case study group investigation</td>
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<td>24</td>
<td>Wed, April 26</td>
<td>Public health policy</td>
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<tr>
<td>25</td>
<td>Mon, May 1</td>
<td>Final Exam Review</td>
<td>HW #6 due</td>
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<tr>
<td>26</td>
<td>Wed, May 3</td>
<td></td>
<td>FINAL EXAM</td>
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