Semester: Fall 2017
Course Number: 10:832:335:04
Course Title: Epidemiology
Course Day and Time: Thursday, 6:40 - 9:30pm
Location: Beck Hall 219
Course Instructor: Erick Rojas, JD, MPH
Contact Information: erick.rojas@rutgers.edu | Cell 917.945.7443
Office Hours and Location: By appointment – location to be determined

Recommended Text:

Other Resources:
- Principles of Epidemiology in Public Health Practice, 3rd ed. – CDC
  [http://apps.who.int/iris/bitstream/10665/43541/1/9241547073_eng.pdf](http://apps.who.int/iris/bitstream/10665/43541/1/9241547073_eng.pdf)
- Additional material on Sakai course website.

Course Description (catalog)
Study of the principles and methods of epidemiology; the study of the distribution (patterns of occurrence) and determinants (causes) of disease and injury in human populations.

Learning Goals
*Students will:*
- Think critically in public health
- Effectively communicate public health information
- Develop, apply, and analyze concepts from research methods and basic statistics
- Utilize information literacy skills in public health
- Understand the role and importance of professional development
- Understand and apply professional ethics
Core Competencies Addressed

After completing this course, you will demonstrate an understanding of the following core competencies:

1a. Public Health History
1b. Public Health Philosophy
1c. Core Public Health Value
1d. Core Public Health Concepts
1e. Global Functions of Public Health
1f. Societal Functions of Public Health
2a. Basic Concepts of Data Collection
2b. Basic Methods of Data Collection
2c. Basic Tools of Data Collection
2d. Data Usage
2e. Data Analysis
2f. Evidence-based Approaches
3a. Population Health Concepts
3b. Introduction to Process and Approaches to Identify Needs and Concerns of Populations
3c. Introduction to Approaches and Interventions to Address Needs and Concerns of Populations
4a. Science of Human Health and Disease
5a. Socio-economic Impacts on Human Health and Health Disparities
5b. Behavioral Factors Impacts on Human Health and Health Disparities
5c. Biological Factors Impacts on Human Health and Health Disparities
5d. Environmental Factors Impacts on Human Health and Health Disparities

Course Assessment

The following assignments will assess learning goals. Additional information on specific assignments is described below and/or is available on Sakai.

Think critically in public health

Example: Each student will complete a class project on an assigned topic in epidemiology. Active class participation is graded.

Effectively communicate public health information

Example: The class project will require students to explain current epidemiology issues. Homework assignments are geared to developing this learning outcome.

Develop, apply, and analyze concepts from research methods and basis statistics

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1 As required by the Council on Education in Public Health (CEPH) for accreditation of undergraduate programs in public health.
Example: Homework assignments require students to define research methods terms, calculate basic statistics and explain their use within the field of epidemiology. The hourly exams will assess understanding of research methods, calculations, and interpretations.

Utilize information literacy skills in public health

Example: Students must conduct research for both the class project and homework assignments and cite as needed.

Understand the role and importance of professional development

Example: Professional writing and communication is assessed with the class project, homework assignments, and exams.

Understand and apply professional ethics

Example: Many of the weekly topics include controversial subjects, which we will discuss in class and students will include in some of their homework assignments. In addition, the ethics of using human subjects for medical research is explicitly discussed.

Course Grading

<table>
<thead>
<tr>
<th>Course Components and Final Grade</th>
<th>Grading Range</th>
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<tbody>
<tr>
<td><strong>Component</strong></td>
<td><strong>Range</strong></td>
</tr>
<tr>
<td>Class participation and timely attendance</td>
<td>10%</td>
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<tr>
<td>Homework assignments (5)</td>
<td>10%</td>
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<tr>
<td>Quizzes (2)</td>
<td>10%</td>
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<tr>
<td>Group project</td>
<td>20%</td>
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<tr>
<td>Midterm exam</td>
<td>20%</td>
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<tr>
<td>Final exam</td>
<td>30%</td>
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Guidelines for Homework Assignments

Students are expected to work independently on homework assignments. Failure to do so will be considered a violation of Rutgers’ Academic Integrity Policy (see below for details).

<table>
<thead>
<tr>
<th>Full credit – the assignment is complete, correct, and submitted on time (“on time” means prior to the deadline, NO EXCEPTIONS).</th>
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<tbody>
<tr>
<td>Half credit – the assignment is complete, correct, and submitted within one week of the due date.</td>
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<tr>
<td>No credit – the assignment is submitted more than 7 days after the due date.</td>
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Academic Integrity

Academic Integrity is vital to the mission of Rutgers, to education at Rutgers and membership in the Rutgers community. It is a core value that supports trust among students, and between students and teachers. It is also a shared value; administration, faculty and students each play a vital part in promoting, securing and nurturing it.

Academic dishonesty is not an individual act that affects only the students involved. It violates communal trust, impacts other members of the community, and is an offense against scholarship. For this reason, any instance of cheating or plagiarism will be dealt with harshly.

Honesty matters. As a shared value, administration, faculty and students each play a vital part in promoting, securing and nurturing it. See the Rutgers Academic Code and Academic Oath at:

http://academicintegrity.rutgers.edu/

Attendance and Cancellation of Classes

In accordance with Rutgers University regulations, attendance is expected at all regularly scheduled meetings of a course and individual courses may set policies for maximum absences. Please refer to the link below for more specific information:

http://sasundergrad.rutgers.edu/academics/courses/registration-and-course-policies/attendance-and-cancellation-of-class

Students are expected to attend all classes; if you expect to miss one or two classes, please use the University absence reporting website https://sims.rutgers.edu/ssra/ to indicate the date and reason for your absence. An email is automatically sent to me.

Students with Disabilities

Rutgers University welcomes students with disabilities into all of the University’s educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: https://ods.rutgers.edu/students/documentation-guidelines. If the documentation supports your request for reasonable accommodations, your campus’s disability services office will provide you with a Letter of Accommodations. To begin this process, please complete the Registration Form on the ODS website at: https://ods.rutgers.edu/students/registration-form. In addition, please notify me as soon as possible if you are in the process of obtaining documentation and turn your paperwork in to me at least two weeks prior to the midterm.
Class Rules

In general, cell phones are prohibited during class. Please turn off all ringers and notifications prior to the start of class. Laptops and tables are permitted provided you use them to access course content and taking notes. I reserve the right to ask any student to put away their electronic device at any time.

Exams require simple calculators and pencils/pens. Cell phones will not be allowed to be used as a calculator under any circumstances during an exam. Calculators may not be shared during examinations.

All examination scheduling conflicts must be discussed at least 1 week prior to the scheduled date of the exam. In the event of an emergency or illness on the day of an exam, you must notify me prior to the start of the exam. If requested, student must provide verification of the absence in order to schedule a make-up exam. Students who do not make alternate arrangements prior to the exam will be given a grade of “0” for that exam.

Preliminary Class Outline

The following is a preliminary schedule of lecture topics and accompanying textbook readings. Additional readings will be assigned throughout the semester. Any changes to the syllabus will be announced during class and an updated syllabus will be posted on Sakai.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic &amp; Quiz/Exam Schedule</th>
<th>Suggested Readings in Schneider &amp; Lilienfeld</th>
<th>Assignment: Due on Thursdays</th>
</tr>
</thead>
</table>
| Week 1 9/7 | **Key topics:**  
  - Overview of epidemiology; Rise of epi in history; Important figures in epi. | Chapter 1: Laying the foundations; Chapter 2: Threads of epidemiologic history | |
| Week 2 9/14 | **Key topics:**  
  - Counts, ratios, proportions and rates; Crude rates including mortality rate; Proportional mortality ratio versus cause specific mortality rate; Incidence versus prevalence; Risk versus rate. | Chapter 3: Selected epidemiologic concepts | |
| Week 3 9/21 | **Key topics:**  
  - Inductive versus deductive science; Models of causality including epi triad and casual pies; Hill’s criteria; Risk factor; Primary, secondary, and tertiary prevention and the natural history of disease. | Chapter 4: Inferring casual relationships | Assignment 1 due |
| Week 4 9/28 | **Key topics:**  
  - Calculating and interpreting crude versus specific (stratified) versus | Chapter 5: Vital statistics; Chapter 6: Using vital statistics | |

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<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Key Topics</th>
<th>Assignment Due</th>
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<tbody>
<tr>
<td>5</td>
<td>10/5</td>
<td><strong>Quiz 1 (Weeks 1-4)</strong>&lt;br&gt;Key topics: Characteristics and requirements for screening tests; Basic measures (i.e., sensitivity, specificity); Efficiency versus efficacy; Prevalence and positive and negative predictive values.</td>
<td>Chapter 13: Clinical applications</td>
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<tr>
<td>6</td>
<td>10/12</td>
<td><strong>In-class Midterm Exam (Weeks 1-7)</strong></td>
<td>Chapter 7: Morbidity statistics</td>
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<tr>
<td>7</td>
<td>10/19</td>
<td><strong>In-class Midterm Exam (Weeks 1-7)</strong></td>
<td>Chapter 8: Using morbidity statistics</td>
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<tr>
<td>8</td>
<td>10/26</td>
<td>Key topics: Study design overview and basic characteristics; Scientific hypotheses; Two by two tables; Descriptive designs (case reports, ecologic, cross sectional studies); Descriptive epidemiology (characteristics of person, place, and time).</td>
<td>Assignment 2 due</td>
</tr>
<tr>
<td>9</td>
<td>11/2</td>
<td>Key topics: Overview of design including selection of controls, recall bias, advantages and disadvantages, calculation and interpretation of Odds Ratio; Applications and examples of case control studies; P-values and confidence intervals; Clinical versus statistical significance.</td>
<td>Assignment 3 due</td>
</tr>
<tr>
<td>10</td>
<td>11/9</td>
<td>Key topics: Overview of design including subtypes, common biases, advantages and disadvantages, calculation and interpretation of Risk Ratio; Applications and examples of cohort studies; Risk</td>
<td>Chapter 9: Observational studies: Cohort studies</td>
</tr>
</tbody>
</table>
| Week 11 11/16 | **Quiz 2 (Weeks 8-10)**  
**Key topics:**  
- Overview of design, especially RCT and variants (cross over and factorial); Control of bias; Ethical and practical limitations; Internal versus external validity; Systemic versus random error.  
| Chapter 11: Experimental studies: Randomized controlled trials;  
Chapter 12: Experimental studies: Community and cluster trials  
| Assignment 4 due |
| Week 12 11/21* | **Key topics:**  
- Chain of infection; Infectivity, pathogenicity and virulence; Direct versus indirect transmission; Outbreak investigation basics and measures including epicurves and attack rates.  
| Chapter 14: Field epidemiology |
| Week 13 11/30 | **Key topics:**  
- Agents and health effects for chemicals, heavy metals, ionizing and non-ionizing radiation; Exposure routes into body and exposure pathway; Occupational study design basics including calculation and interpretation of SMR.  
| Chapter 15: Evidence-based practices |
| Week 14 12/7 | **Class wrap up (last class)**  
**Group Presentations**  
**Timed exam on cumulative material open from Monday 12/11 – Thursday 12/14.**  
| Assignment 5 due |
| 12/14 | **Last day to take timed exam. Must be submitted by 11:59 PM on 12/14.** |

* Rutgers has assigned Thursday classes to meet on Tuesday this week.