EPIB 611 Intermediate Epidemiology

Semester: Spring, 2016
Classroom and Time: Rm 0307, Thursdays, 4:00pm – 6:45pm
Instructor: Cher Dallal, Ph.D.
Office Hours: By appointment
Office: 2234GG SPH Bldg
Phone: 301-405-7065
Email: cdallal@umd.edu

Teaching Assistant: Jared Fisher, M.P.H.
jafisher@umd.edu
Wednesdays 2:30 – 4 pm, Office: 1222 (MIAEH GA suite)

Course Pre- and Co-requisites:
- Required: EPIB 610 Foundations of Epidemiology
- Recommended: EPIB 650 Biostatistics I, EPIB 651 Biostatistics II

Required Texts and Other Readings:
- Other relevant readings will be posted on Canvas or distributed in class

Class Notes:
- Class notes will be provided to students at the beginning of each class session. Class readings and other materials distributed should be reviewed prior to the class session.

Additional Materials Required: Calculator (cell phones will not be allowed during exams)

Course Description:
This course is designed to discuss and apply various epidemiologic methods, such as calculating disease frequency and association, determining causal inference, assessing confounding, effect modification, and threats to validity. Methods to address biases in the design and implementation of epidemiologic studies will be discussed along with measurement issues such as validity and reliability. As special topic areas, additional lectures will focus on emerging topics in epidemiology.

Course Learning Objectives:
Upon completing this course, the student will be able to:
1. Distinguish among various epidemiologic study designs and evaluate strengths and weaknesses of each design.
2. Calculate and apply prevalence, risk, and cumulative incidence measures.
3. Estimate and interpret risk and rate differences to the different epidemiologic study designs and identify when each measure is used.
4. Calculate and interpret attributable risk and rate percent and population attributable risk and rate percent.
5. Illustrate elements to establish causality.
6. Evaluate confounding and effect modification and identify procedures to address them.
7. Apply methods to reduce random and systematic errors.
8. Demonstrate different types of validity and reliability measures.
9. Compare various types of sampling methods.
10. Effectively design survey questions.
11. Critically evaluate epidemiologic literature.
12. Communicate epidemiologic information.

Program Competencies Addressed in this Course:
The following competencies for the MPH and PhD degrees in epidemiology are addressed in this course. This course also meets the requirements for training in epidemiologic principles for other MPH degrees at the University of Maryland College Park School of Public Health:

1. Explain the importance of epidemiology for informing scientific, ethical, economic and political discussion of health issues.
2. Describe a public health problem in terms of magnitude, person, time and place.
3. Apply the basic terminology and definitions of epidemiology.
4. Calculate basic epidemiology measures.
5. Calculate advanced epidemiology measures.
6. Evaluate strengths and limitations of epidemiologic reports.
7. Draw appropriate inferences from epidemiologic data.
8. Differentiate among the criteria for causality.
9. Communicate epidemiologic information to lay and professional audiences.
10. Describe epidemiologic study designs and assess their strengths and limitations.
11. Critically evaluate measures of association.
12. Critically appraise epidemiologic literature.
13. Critically evaluate questionnaire and survey instruments.
14. Describe and apply statistical approaches to address threats to validity in epidemiologic studies.
15. Compare clustered data with traditional epidemiologic data from survey and randomized clinical trials.
16. Analyze causal associations.

Course Organization
The class sessions will include lectures, discussions and in-class exercises. Lectures may not cover all materials included in the reading assignments; however, students are expected to complete the assigned readings prior to class. Students are expected to actively participate in class discussions and exercises. This is a graduate level course, and students can expect to put in an average of 9 hours of work outside of class each week to master the material.

The instructor welcomes meetings with students outside of class to discuss questions as well as to gain more insight about the material presented in class. Please contact the instructor to set up an appointment. Please be reminded, however, that attendance at every class is expected. Material will not be presented on a one-on-one basis at other times. Excessive lateness or absence from class is disruptive to the class and will hinder your learning. Students who miss class are responsible for obtaining notes and handouts from other students.

Course Requirements:

1. **Homework**: There will be four assignments. They are worth 25% of your grade. The first three assignments will be individual assignments (worth 5% each); the last assignment will be a group assignment and will involve a class presentation (worth 10%). These will be explained in detail when the assignments are distributed in class.
Assignments 1-3 are due at the beginning of class on the dates listed on the syllabus. Late homework will NOT be accepted without a reasonable circumstance and advance notice. Assignments submitted after 4 pm on the due date will receive an automatic 10% deduction in grade. Only hard copies of homework assignments will be accepted.

2. **In-class exercises & general participation:** Students are expected to actively participate during in-class exercises. Additionally, during lectures and in-class exercise sessions, the instructor may ask questions related to the readings. Participation is worth 10% of your grade.

3. **Mid-term and Final exams:** A mid-term and a final exam will be held during class sessions and will be two hours in duration (for each exam). The format of the examination will consist of calculations, true/false, multiple choice, and short-answer. More details on these exams will be given in class.

   **As a general rule, make-up exams and advance exams will not be given.** Exceptions to this rule are evaluated on a case-by-case basis. Students must submit the request before the exam takes place and will need to provide valid supporting documents. Requests will not be considered after the exam date unless an extreme exception has occurred, i.e. the student is hospitalized during the exam period.

**Use of laptops, netbooks, smartphones, e-readers, or other communication devices**

Please place your cell phone on vibrate or turn it off during class and also limit the use of laptops/netbooks/smartphones/e-readers/communication devices to legitimate classroom purposes (e.g., taking notes, downloading class information from ELMS/Canvas, working on an in-class exercise). E-mail, instant messaging, surfing the Internet, reading the news, watching movies, or playing games are not considered legitimate classroom purposes. Each classroom session includes a scheduled break. In addition, you may quietly step out of the room to attend to urgent emails or calls.

During exams, use of laptops, netbooks, smartphones, e-readers, or other communication devices is prohibited. If these devices are seen and/or used during an exam, the exam will be collected from the student, the student will no longer be allowed to continue taking the exam and will earn a grade of zero.

**Canvas:**
The syllabus, readings from journals, and other course materials will be posted on the Canvas website for EPIB611: [https://elms.umd.edu](https://elms.umd.edu). Please remember to check it on a regular basis.

**Course Policies:**

- **Email – The Official University Correspondence:**
- **Verify your email address** by going to [www.my.umd.edu](http://www.my.umd.edu).

All enrolled students are provided access to the University’s email system and an email account. *All official University email communication will be sent to this email address* (or an alternate address if provided by the student). Email has been adopted as the primary means for sending official communications to students, so email must be checked on a regular basis. Academic advisors, faculty, and campus administrative offices use email to communicate important and time-sensitive notices.
Students are responsible for keeping their email address up to date or for redirecting or forwarding their email to another address. Failure to check email, errors in forwarding email, and returned email (from “full mailbox” or “unknown user” errors for example), will not excuse a student from missing University announcements, messages, deadlines, etc. Email addresses can be quickly and easily updated at www.my.umd.edu or in-person at the Student Service Counter on the first floor of the Mitchell Building. For technical support for University email: www.helpdesk.umd.edu or call 301-405-1400.

Absence Policy:
In accordance with University policy, if you are absent for a single (1) lecture due to illness or some form of personal or family emergency, this absence will be considered “excused” and the instructor will accept a note from you attesting to the date of the illness/incident, along with an acknowledgement that the information is true. Whenever feasible, you should try to contact the instructor in advance.

Multiple or prolonged absences, and absences that prevent attendance at a major scheduled grading event (like an exam or test) will require written documentation from an appropriate health care provider/organization.

A link to pull information on the new policy covering absences from class can be found at http://www.president.umd.edu/policies/v100g.html

Late work:
All assignments are due at the beginning of class on their specified dates. Only hard copies of assignments, reports and papers are accepted, except where indicated. E-mail and FAX copies will not be accepted, except where indicated. 10% will be deducted for each day the assignment is late unless arrangements have been made prior to class. Work will not be accepted beyond two days after deadline except in extreme circumstances approved by your instructor. All coursework must be completed by the end of the term, or an incomplete grade will be assigned.

Religious Observances:
The University System of Maryland policy provides that students should not be penalized because of observances of their religious beliefs; students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. It is the student’s responsibility to inform the instructor in advance of any intended absences for religious observance.

Special Accommodations / Disability Support Services:
If you have a documented disability and wish to discuss academic accommodations for test taking or other needs, you will need documentation from Disability Support Service (301-314-7682). If you are ill or encountering personal difficulties, please let the instructor know as soon as possible. You can also contact Learning Assistance Services (301-314-7693) and/or the Counseling Center (301-314-7651) for assistance.

Academic Integrity:
The University's code of academic integrity is designed to ensure that the principle of academic honesty is upheld. Any of the following acts, when committed by a student, constitutes academic dishonesty:
• **CHEATING**: intentionally using or attempting to use unauthorized materials, information, or study aids in an academic exercise.
• **FABRICATION**: intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
• **FACILITATING ACADEMIC DISHONESTY**: intentionally or knowingly helping or attempting to help another to violate any provision of this code.
• **PLAGIARISM**: intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise.

For more information see: [http://www.shc.umd.edu/code.html](http://www.shc.umd.edu/code.html).

The Honor Pledge is a statement undergraduate and graduate students should be asked to write by hand and sign on examinations, papers, or other academic assignments. The Pledge reads:

*I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination.*

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit [http://www.shc.umd.edu](http://www.shc.umd.edu).

**Copyright Protection for Class Materials:**
My lectures and course materials, including power point presentations, tests, outlines, and similar materials, are protected by copyright. Persons who publicly distribute or display, or help others publicly distribute or display, copies or modified copies of an instructor’s course materials may be considered in violation of the University Code of Student Conduct, Part 9(k). You may take notes and make copies of course materials for your own use. You may not, and may not allow others, to reproduce or distribute lecture notes and course materials publicly, whether or not a fee is charged, without my express written consent.

**Inclement Weather / University Closings:**
In the event that the University is closed for an emergency or extended period of time, the instructor will communicate to students regarding scheduled adjustments, including rescheduling of examinations and assignments due to inclement weather and campus emergencies. Official closures and delays are announced on the campus website ([http://www.umd.edu](http://www.umd.edu)) and snow phone line (301-405-SNOW), as well as local radio and TV stations.

**Course Evaluations**
The University, the School of Public Health, and the Department of Epidemiology and Biostatistics is committed to the use of student course evaluations for improving the student experience, course and curriculum delivery, and faculty instruction. Your evaluations help instructors improve their courses; help deans and department chairs decide on merit pay for faculty, renewal of contracts, and support tenure and promotion decisions; and help current and future students decide on classes. The system ([www.CourseEvalUM.umd.edu](http://www.CourseEvalUM.umd.edu)) will open at the beginning of May for Spring 2016 courses.
**Grading Procedures:**

**Grade Weights**
Class participation (including in-class exercise participation): 10%
Homework: 25%
Mid-Term Exam: 30%
Final exam: 35%

**Grading**
Below is a ‘general guideline’ for grading. However, *final grades may be assigned relatively based on the curve of the class.*

98% +  A+
94% – 97%  A
90% – 93%  A−
88% – 89%  B+
84% – 87%  B
80% – 83%  B−
78% – 79%  C+
74% – 77%  C
70% – 73%  C−
68% – 69%  D+
64% – 67%  D
60% – 63%  D−
< 60%  F
<table>
<thead>
<tr>
<th>Date</th>
<th>Learning Objectives</th>
<th>Topic, Readings and Assignments</th>
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<tbody>
<tr>
<td>Session 1</td>
<td>1/28</td>
<td><strong>Class Introduction / Overview of class</strong></td>
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<td><strong>Review of Fundamentals</strong>: Study Designs</td>
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<td>Measures of Disease Frequency</td>
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<td>1-3</td>
<td><strong>Reading</strong>:</td>
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<td>• Szklo &amp; Nieto, Chapter 1 &amp; 2</td>
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<td>Session 2</td>
<td>2/4</td>
<td><strong>Topic</strong>:</td>
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<td>1-4</td>
<td>• Cumulative Incidence: Life Table Approach, Kaplan-Meier</td>
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<td>• Measures of Association</td>
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<td>• Cohort Studies: Nested-Case Control, Case-cohort</td>
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<td><strong>Reading</strong>:</td>
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<td>• Szklo &amp; Nieto, Chapters 2 and 3</td>
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<td>Session 3</td>
<td>2/11</td>
<td><strong>Topic</strong>:</td>
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<td>5</td>
<td>• Causal Inference in Epidemiology</td>
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<td><strong>Reading</strong>:</td>
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<td>• Szklo &amp; Nieto, Chapter 10</td>
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<td><strong>Homework Assignment #1 Distributed</strong></td>
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<td>Session 4</td>
<td>2/18</td>
<td><strong>Topic</strong>:</td>
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<td>7</td>
<td>• Validity: Information Bias (reschedule until next week 2/25)</td>
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<td><strong>Readings</strong>:</td>
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<td>• Szklo &amp; Nieto, Chapter 4</td>
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<td><strong>Homework Assignment #1 Due</strong></td>
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<td>Session 5</td>
<td>2/25</td>
<td><strong>Topic</strong>:</td>
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<td>7</td>
<td>• Validity: Information Bias</td>
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<td><strong>Readings</strong>:</td>
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<td>• Szklo &amp; Nieto, Chapter 4</td>
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<td><strong>Homework Assignment #2 Distributed</strong>: Practice exercises on topics</td>
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<td>Session 6</td>
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<td><strong>Topic</strong>:</td>
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<td>• Selection Bias</td>
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<td>• Midterm review</td>
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<td><strong>Readings</strong>:</td>
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<td>• Szklo &amp; Nieto, Chapter 5</td>
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<td><strong>Homework Assignment #2 Due</strong></td>
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<td>Session 7</td>
<td>3/10</td>
<td>6 Midterm</td>
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<td>3/17</td>
<td>Spring Break!</td>
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<td>Session</td>
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| 8       | 3/24 | 6     | - Confounding  
- Effect Modification  
- Statistical assessment of effect modification: additive and multiplicative interactions  
|         |      |       | - Szklo & Nieto, Chapter 6 |
| 9       | 3/31 | 6     | - Statistical assessment of effect modification: additive and multiplicative interactions  
- Stratification and Adjustment  
- Matching  
- Effect modification vs Confounding  
|         |      |       | - Szklo & Nieto, Chapter 6 & 7 |
|         |      |       | **Homework Assignment #3 Distributed: Effect Modification and Confounding** |
| 10      | 4/7  | 7,8   | - Data Collection: Measurement (and measurement error)  
Validity & Reliability  
|         |      |       | - Szklo & Nieto, Chapter 8 |
|         |      |       | **Homework Assignment #3 Due** |
| 11      | 4/14 | 9,10  | - Data Collection Part II: Scale Development  
Survey Design  
Sampling  
|         |      |       | To be distributed. |
| 12      | 4/21 | 10, 11| - Methodological Issues in Case-control and Cohort studies  
- Other epidemiological methods: Age, period, and cohort effects  
|         |      |       | To be distributed. |
| 13      | 4/28 | 11,12 | - Emerging Topics in Epidemiology  
|         |      |       | To be distributed. |
| 14      | 5/5  | 11,12 | - Student Presentations (Homework Assignment #4 Due)  
Review for final exam |