SYLLABUS
Epidemiologic Methods (EPID 573B)
Spring 2018

Time: Mondays & Wednesdays 1:30-2:45pm

Location: Drachman Hall A 118

Instructor: Leslie Dennis, MS, PhD
Professor
Email: ldennis@email.arizona.edu with 573B in the Subject line

Office Hours: Email the instructor to request an appointment. The instructor does not check email 24 hours a day 7 days a week. Expect a response within the next 2 business days (so within 24-48 hours). Typically, appointments are best on Mondays and Wednesdays prior to class.

Teaching Assistants: None.

Since there is no course TA, some assignments will be completed on your own by hand, and then entered into an Assignment under Quizzes to be graded. Other assignments will be brought to class for grading by you, fellow students and/or the instructor, with a few remaining assignment graded after submission to D2L. Since there is not a TA, several Practice Problems are provided with solutions similar to Assignments and Exam questions.

Catalog Description: This course will increase the student's understanding of research methods in epidemiology and provide practice for the epidemiology student to design research studies and review other epidemiologic research designs.

Course Prerequisites: EPID 573A, EPID 576A

Course Objectives and Expected Learning Outcomes:
This course will expand on basic concepts and principles of epidemiology discussed in 573A and 576A, and go into more depth in epidemiology methods.

Course Objectives Upon completion of this course students will be able to:
- Describe the strengths and limitation of various study designs
- Realize the major sources of bias & contrast across study designs,
- Illustrate the methodological characteristics of the most important data collection techniques,
- Describe the strengths and limitation of using existing data,
- Develop skills to use research methods in epidemiologic, and
- Communicate results.

Learning Outcomes (Competencies Obtained): Core MPH competencies that will be addressed during this course from the 22 CPEH required competencies include parts of 1-4.

**Epidemiology MPH Program (in-person) specific Competencies Covered:**
(2) Compare the relative strengths and weaknesses of epidemiological study designs, and choose the most appropriate design for specific research questions.
(3) Calculate appropriate measures of disease frequency and excess risk.
(4) Recognize and describe potential biases, confounding, and effect modification that can affect epidemiological studies and analyses.
(5) Interpret epidemiological analyses in the context of published literature and communicate key findings to various audiences.

**MS Epidemiology Competencies:**
(1) Select appropriate study design for assessing the association between a given exposure and an outcome, and then understanding advantages and limitations of these approaches.
(3) Identify potential sources of bias for various study designs and their impact on study quality.
(4) Conduct descriptive and analytic analyses, including strategies to assess confounding and effect modification methods, to make statistical inferences.
Partial ability to (6) Demonstrate ability to manage and analyze epidemiological data from a one (rather than a variety of sources) sources.
(7) Organize and deliver clear presentations of research findings in varying professional formats to diverse audiences.

**PhD Epidemiology Competencies:**
(3) Design appropriate studies using causal inference principles for testing hypotheses in specific populations, after evaluating specific design advantages and limitations.
(4) Evaluate the integrity, comparability, and limitations of data to make inferences related to analyses and results.

**MATERIALS:**

**Course Notes:** All course material will be available on D2L.

**Required Textbook and Readings:** *none*
Readings and Notes will be provided on the D2L website.

**Required or Special Materials:**
- Green pen
- Calculator (not connected to internet for exams thus not cell phone or computer)

Students are expected to either bring assignments to class on their laptops or a printed version. Please review assignments for clarifications of when a printed version is required.

Additionally, students are expected to have and bring to class a green pen to mark-up printed assignments when required based on in-class discussions, to be turned in at the end of class for credit or scanned to D2L.
**Course Software:**
Assignments are typically expected to be completed in MS Word. There may be occasion to use Excel.

Students will have the choice to use either STATA or SAS statistical packages to conduct their analyses of the survey data. Thus, the course will provide STATA and SAS programming tutorials. Students are responsible for obtaining access to either STATA or SAS statistical software. R is not supported by this course.

Students will also need to have access to Qualtrics, which is available to University of Arizona students. Qualtrics is a program that develops online surveys (or data entry programs). EPID 573B will only provide information on how to use Qualtrics for developing survey items. The group assignment for online survey software will either require output from Qualtrics.

**Course Requirements:**
**Preliminary quiz (for no grade) required to get access to Assignment #1:**

This course is 15-16 weeks. For a UA 15-week course you are expected to spend 3 hours per week in class plus 6-9 hours outside of class for a 3 credit course. Since this is the second semester epidemiology methods course, it tends to be the meat of epidemiological methods and for many students it may take the maximum time most weeks to complete assignments and prepare for quizzes and exams.

The class project(s) will include the following that are specifically listed as assignments.

a) Design a survey in Qualtrics with your assigned Group B (Tutorials will only cover this online software not others). Each group will be assigned topics (to save time), design the survey items, and then enter them into Qualtrics using relevant skip logic and range checks.

b) Here students will analyze the results of a prior survey in STATA or SAS. Groups will be stratified by use of STATA or SAS.

   a. Your assigned Group C will include other students with topics on the same dataset. The groups are expected to work together for initial programming to read in data and to run descriptive analyses on demographic factors for a Table 1 (if you were writing a whole article).

   b. Each student will be randomly assigned to an analyses topic (unique outcome & exposure combination). Students will then edit and add to the group program to examine crude and adjusted models for their outcome & exposure.

Due to the limited time within a semester, these 2 class projects are separate since analyzing your own survey data would add a lot of other steps.

Typically each Week will have:

**Readings** – are expected to be completed prior to class on the date that they are listed.

**Assignments** – to be turned in for credit prior to class on the date listed. Points are listed for each Assignment on the schedule. Assignments will be worth 20 points and the lowest assignment grade will be dropped.

- A few Assignments will be turned into D2L Assignments. These should be in Word so that the instructor can give feedback using tracked changes.

- Most assignments will be turned in by entering your answers to the relevant labeled Assignment under Quizzes to auto grade since this course does not have a TA. I advise students to complete these Assignments in Word or on paper prior to opening the quiz.
4 other in-class or other exercises each worth 5 points, for 20 points total.

**Discussions** – are required to expand upon some ideas, more specifically to provide GROUP discussions on Assignment to post, so that afterwards individuals can comment on disagreements, discrepancies, other details and/or clarifications requested for the whole class to review with instructor comments.

**Quizzes** – there will be 4 online timed quizzes to help students to identify when they may not be grasping basic aspects of the topics.

**2 exams** – these cover materials in class and/or Assignments. They are timed.

**Assignments (35% of grade)**

- Points and due dates are listed for each Assignment. They total ~35% of your course grade.
- The Assignments walk students through important epidemiological concepts.
- **Due to the pace of this course note late Assignments will be accepted/graded.**
- Download the homework assignment in Word.

Turning in Assignments:

- **Submitted under Quizzes:** Most assignments after they are completed need to be entered under Quizzes listed as Assignments so that D2L will self-grade the Assignment for course points. The instructor recommends that you complete assignments in Word or by Hand before submitting to the Assignment under Quizzes. You may also want to bring them to class for discussion.
- **Submitted to the Assignment tab:** When requested Upload the Assignments in one Word file unless otherwise specified. Assignments must be submitted as a Word file to the Assignment tab by the due date. This will allow the instructor to provide feedback through track changes. Feedback will not be provided for any non-Word documents submitted. For these assignments download the homework assignment in Word; and then answer the homework in blue or bold font within the Word document when submitted for assignments listed under the Assignments tab. Points will be taken off for not using the required fonts (Arial 11 pt) and 1 inch margins on written assignments listed under the assignment tab, especially Assignments 12 and 13.

- A detailed Answer Key will typically post after an Assignment is due. Thus, no late assignments will be accepted after the Answer Key has posted.

**Drop lowest Assignment:** Of the 13 Assignments each worth 20 points (either overall, or within revision via groups or in-class exercises), your lowest scored Assignment will be dropped. This leaves 12 assignments at 20 points = 260 points.

**Minor class exercises:**

- Additionally there will be 20 points; 5 points each for 4 other minor class exercises. These will be classified differently from Assignments, so that the lowest 20-point Assignment score can be dropped from you grade. They include in-class activities and one online activity.

**Discussions:**

- Assignment #2 will be posted on the discussion board for other students to later comment.
  - In Weeks 1-2, the discussions are an important part of the class outlining case-control study design notes. Rather than comment on 30+ students’ Assignment #1,
the instructor will comment on the group Assignment #2 posts on D2L. The instructor will also comment on other students additions or disagreements with group posts: this will be done to note epidemiological methods for all students; thus if a student comment is incorrect, it will be noted as such – not to shame or discredit that student but to clarify the concept for all students.

- Other discussion boards/comments are set up for clarifications that they whole class may benefit from.

Additionally, the instructor has set up a sharing mechanism for group assignments. During the semester each student will be assigned to 3 different groups, one each for: study design assignments, survey design and analyzing data.

**Quizzes (15% of grade):**

There will be 4 quizzes. The purpose of quizzes is for student to attempt to gage where they are in their understanding of course concepts prior to exams. This will allow student opportunity to focus and student more for exams the quizzes suggest that they are not prepared for. The quiz points are equivalent to 1-2 assignments or 10-20% of exam points, thus are lower impact at a time where modifications can be made in studying techniques, studying with other students and meeting with the instructor if proactive. Quizzes account for 15% of the course grade.

**Exams (50% of grade):**

There will be 2 exams: one before spring break and a final exam, each 200 points. The exams will account for 400 points out of 800 points, so for 50% of your grade. Make-up exams will only be considered with valid excuses determined by the instructor and based on UA policies, and must be scheduled and taken prior to the scheduled midterm and final exams. Students with disabilities are responsible for informing the instructor via UA policies at the beginning of the semester.

Therefore:

- **Assignments & Exercises:** 35% (260+20= 280 of 800 points) based on 12 of 13 assignments
- **Quizzes:** 15% (120 of 800 points) based on 4 quizzes
- **Exams:** 50% (400 of 800 points) based on 2 exams

**Grading Scale /Student Evaluation:** Regular grades are awarded for this course (A, B, C, D, E.)

- A: ≥ 90%
- B: ≥ 80-89.99%
- C: ≥ 70-79.99%
- D: ≥ 60-69.99%
- E: < 60%

If you think the instructor has made an error in grading, please email the instructor in a polite manner as soon as possible (not at the end of the course).

**Incomplete Grades not allowed:** Since this class is only taught once a year and is required for 573C, incomplete grades are not allowed except for extreme medical emergencies.

Late Assignments will not be accepted unless revised dates are posted for the whole class.

**Class Attendance/Participation:** Regular online participation is expected, with defined due date for each Practice Problem, Assignments, Discussions and Quizzes. Class Discussions are very important. Attempting to complete all assignments one day a week will not work for this course. Review the suggested and the required due dates for each week.
All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion. These need to be identified to the instructor in week 1 of the course. Extensions in due dates pre-approved by the UA Dean of Students (or Dean’s designee) will be honored. Therefore, they need to be brought up during the first week of class.

**Course Schedule**: see attached and updates on D2L

**Classroom Behavior**: Expected behavior is to allow for respectful exchange of ideas: these include being respectful towards your fellow student and instructor(s) when communicating via Discussion boards and email.

**Communications**: You are responsible for reading emails sent to your UA account from your instructor and the announcements that are placed on the course web site. Information about readings, news events, your grades, assignments and other course related topics will be communicated to you with these electronic methods. The official policy can be found at: [https://www.registrar.arizona.edu/personal-information/official-student-email-policy-use-email-official-correspondence-students](https://www.registrar.arizona.edu/personal-information/official-student-email-policy-use-email-official-correspondence-students)

**UA Smoking and Tobacco Policy**: The purpose of this Policy is to establish the University of Arizona’s (University) commitment to protect the health of University faculty, staff, students, and visitors on campuses and in its vehicles. The official policy can be found at: [http://policy.arizona.edu/ethics-and-conduct/smoking-and-tobacco-policy](http://policy.arizona.edu/ethics-and-conduct/smoking-and-tobacco-policy)

**University Course Policies**: [https://academicaffairs.arizona.edu/syllabus-policies](https://academicaffairs.arizona.edu/syllabus-policies)

These policies include Threatening Behavior Policy, Accessibility and Accommodations, Code of Academic Integrity, and Nondiscrimination and Anti-Harassment Policy

**Syllabus Changes**: Information contained in the course syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.

**Plagiarism**: Plagiarism can occur when a student copies text word-for-word (direct quoting should rarely be used in epidemiology) instead of paraphrasing and correctly referencing materials used for preparing a written assignment. This includes fictitious or incorrect references. If plagiarism is detected on an assignment, it will result in automatic failure for that assignment.

A second offense or plagiarism of the final manuscript will result in automatic course failure. All these actions will be reported to the Program Director, the Dean of the College of Public Health, and the Dean of Students. This policy is in place for this class because scientific writing is a fundamental skill at both the undergraduate and graduate level in this field, and for this course. If you feel you are unsure as to what might constitute plagiarism, there are numerous resources at the University of Arizona, including the writing lab, to help you understand and avoid plagiarism.

**Plagiarism & Cheating: What counts as plagiarism or cheating?**
- Copying and pasting information from a website or another source.
- Copying and pasting information from a website or another source, and then revising it so that it sounds like your original idea.
- Doing an assignment/essay/take home test with a friend and then handing in separate assignments that contain the same ideas, language, phrases, etc.
- Asking someone else the answers to the assignments then using those answers.
- Quoting a passage without quotation marks or citations, so that it looks like your own.
- Paraphrasing a passage without citing it, so that it looks like your own.
- Hiring another person to do your work for you, or purchasing a paper through any of the on- or off-line sources.

The Epidemiology Program faculty members reserve the right to check assignments or papers with TurnItIn for plagiarism.

**Classroom civility:** In this interactive course it is expected that students and the instructor will:
- use respect (including disagreeing respectfully) both when posting and responding to posts
- listen to discussions/posts and involve others
- resist the temptation to dominate discussion by waiting for others to contribute
- consider everyone’s opinions to be “valid” or at least interesting or a reference point for examining one’s own opinions; allow thinking broadly, “outside the box”
- appreciate a small amount of tension (too much “sameness” means dull discussion)
- stay focused on the subject (anyone can raise the possibility that discussion is getting too tangential, that too much time is being spent on a small issue, that other issues are being neglected. Others can challenge this and defend spending more time.)

**Recommended Learning Strategies**
To be an effective learner in this course the following are strongly encouraged:
1. Continuously monitor the course outline. The course outline includes all deadlines for the course. Do not expect to be reminded of any of the due dates on the course outline. Unless otherwise notified, students are accountable for meeting all deadlines as listed on the outline.
2. Check the course website regularly for announcements.
3. Read all recommended readings.
4. Participate in class discussion.
5. Ask questions.
6. Answer questions.
7. Use the discussion boards.
8. Listen to your classmates; their insights are an important source of learning in this course. A general rule of thumb is to let at least two other people have a chance to say something before you speak again.
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Readings/Presentation to review prior to class</th>
<th>Assignments Individual–due prior to 1:30pm date listed Group - due 3pm 1 day after date listed</th>
<th>pts</th>
</tr>
</thead>
<tbody>
<tr>
<td># 1</td>
<td>Jan 9</td>
<td>Overview of course &amp; review 573a</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan 16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># 3</td>
<td>Jan 21</td>
<td>HOLIDAY – NO CLASS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan 23</td>
<td>Types of Controls in C-C studies</td>
<td>Revise your Assignment 1 based on 2 &amp; 3</td>
<td>30</td>
</tr>
<tr>
<td># 4</td>
<td>Jan 28</td>
<td>Case-Control Design Options</td>
<td>Quiz 1 C-C (20pts) In-class Grp A: Bias by Case-control Design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan 31</td>
<td>Compare &amp; Contrast Design Options</td>
<td></td>
<td></td>
</tr>
<tr>
<td># 5</td>
<td>Feb 4</td>
<td>Cohort</td>
<td>Cohort Notes Assign 3: Exist Cohort Studies (via quiz) In class: calculate CI and ID</td>
<td>20  5</td>
</tr>
<tr>
<td></td>
<td>Feb 6</td>
<td>Cohort</td>
<td></td>
<td></td>
</tr>
<tr>
<td># 6</td>
<td>Feb 11</td>
<td>RCT</td>
<td>RCT Notes Assign 4: Bias by Study Design (via quiz) In class exercise: Design a Cohort Study</td>
<td>20  5</td>
</tr>
<tr>
<td></td>
<td>Feb 13</td>
<td>In-class Study Design</td>
<td>Quiz 2 (40 pts) Assign 5: Design assigned study, bring to class, discuss and revise as a group</td>
<td></td>
</tr>
<tr>
<td># 7</td>
<td>Feb 18</td>
<td>Reliability &amp; Misclassification</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feb 20</td>
<td>Reliability &amp; Misclassification</td>
<td>Assign 6: Reliability &amp; Misclassification</td>
<td>20</td>
</tr>
<tr>
<td># 8</td>
<td>Feb 25</td>
<td>Review</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feb 27</td>
<td>Exam 1 (200 pts)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mar 2-10</td>
<td>SPRING BREAK – NO CLASS</td>
<td></td>
<td></td>
</tr>
<tr>
<td># 9</td>
<td>Mar 11</td>
<td>Survey Design, Group B work session</td>
<td>D2L Presentation on Survey Design Complete a survey in Qualtrics</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Mar 13</td>
<td>Survey Design, Group B work session</td>
<td></td>
<td></td>
</tr>
<tr>
<td># 10</td>
<td>Mar 18</td>
<td>Confidential</td>
<td>skim notes Assign 7: Group B Completed Survey</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Mar 20</td>
<td>Effect Modification (EM)</td>
<td>skim notes</td>
<td></td>
</tr>
<tr>
<td># 11</td>
<td>Mar 25</td>
<td>Work through problems</td>
<td>Practice Problems C+EM</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Mar 27</td>
<td>Confounding &amp; Effect Modification</td>
<td></td>
<td></td>
</tr>
<tr>
<td># 12</td>
<td>Apr 1</td>
<td>Confounding &amp; Effect Modification</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apr 3</td>
<td>Confound &amp; EM→Multivariate</td>
<td>Quiz 3 (30 pts) Assign 9: C+EM #2</td>
<td>20</td>
</tr>
<tr>
<td># 13</td>
<td>Apr 8</td>
<td>STATA &amp; SAS tutorials online</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apr 10</td>
<td>STATA/SAS &amp; Presenting Results</td>
<td>Assign 10: Living in SW (Stata/SAS program)</td>
<td>20</td>
</tr>
<tr>
<td># 14</td>
<td>Apr 15</td>
<td>Multivariate Analyses</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apr 17</td>
<td>Multivariate Analyses</td>
<td>Assign 11: Multivariate Analyses Interpretation</td>
<td>20</td>
</tr>
<tr>
<td># 15</td>
<td>Apr 22</td>
<td>Multivariate Analyses</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apr 24</td>
<td>Multivariate Analyses</td>
<td>Assign 12: Group C – Methods, Table 1</td>
<td>20</td>
</tr>
<tr>
<td># 16</td>
<td>Apr 29</td>
<td>Multivariate Analyses</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apr 31</td>
<td>Multivariate Analyses</td>
<td>Assign 13: Methods, Table 1 &amp; 2 Assign 14: Final Analysis Program</td>
<td>20</td>
</tr>
<tr>
<td>#</td>
<td>Mar 6</td>
<td>Final Exam (200pts): 1 –3 pm</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

*May 6 Final Exam (200pts): 1 –3 pm Monday room Drachman A118*