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Location: Classroom: Fee Hall E111  
  
Time: Monday and Wednesday, August 29- December 7, 2018  
10:20 a.m. - 11:40 a.m.
Topics

WEEK 1 CONCEPTS

Wednesday, August 29  Introduction/ Causal Criteria

WEEK 2 CAUSAL CRITERIA

Monday, September 3 Labor Day, No Class
Wednesday, September 5  Causal Criteria continued  Homework

WEEK 3 INDUCTION/DEDUCTION

Monday, September 10  Cause/Association
Wednesday, September 12  Induction/ Deduction  Homework

WEEK 4 ECOLOGICAL vs INDIVIDUAL and CAUSAL PATHWAYS

Monday, September 17  Ecological vs Individual
Wednesday, September 19  Ecological across time

WEEK 5 CAUSAL PATHWAYS

Monday, September 24  Causal Pathways
Wednesday, September 26  Causal pathways  Homework

WEEK 6 FOCUS ON INTERNAL/ EXTERNAL VALIDITY

Monday, October 1  Clinical Trials /cohort studies and discuss research question for grant
Wednesday, October 3  Cohort Studies  Homework

WEEK 7 FOCUS ON INTERNAL/ EXTERNAL VALIDITY

Monday, October 8  Case-control studies
Wednesday, October 10  Case-control Studies  Homework

WEEK 8 FOCUS ON TIME-ORDER and CAUSAL INFERENCE

Monday, October 15  Case -Crossover
Wednesday, October 17  Long-Term Effects of Exposure to Chemical Agents; Homework and turn in outline for final grant

WEEK 9

Monday, October 22  In class review of final assignment/ grant proposal; exam review
Wednesday, October 24  Mid-term exam
WEEK 10 FOCUS ON TIME-ORDER and CAUSAL INference

Monday, October 29  Long-Term Effects of Exposure to Infectious Agents  
Wednesday, October 31  continued  Homework

WEEK 11 SOCIAL EPIDEMIOLOGY / GENETICS/OMICS EPIDEMIOLOGY and CAUSAL INference

Monday, November 5  Social Epidemiology  
Wednesday, November 7  Genetics/Omics

WEEK 12 WEIGHING CAUSAL EVIDENCE: CAUSAL INference FROM MULTIPLE STUDIES in SYSTEMATIC REVIEWS and META-ANALYSES

Monday, November 12  
Wednesday, November 14  Homework

WEEK 13 WEIGHING CAUSAL EVIDENCE: AFLATOXIN AND LIVER CANcer

Monday, November 19  Aflatoxin and liver Cancer  
Wednesday, November 21  Aflatoxin and liver Cancer  Homework

WEEK 14 WEIGHING CAUSAL EVIDENCE

Monday, November 26  Student Presentations  
Wednesday, November 28  Student Presentations

WEEK 15 WEIGHING CAUSAL EVIDENCE:

Monday, December 3  Student Presentations  
Wednesday, December 5  Student Presentations

WEEK 16 Final week

December (final)  Student Presentations

Papers Due, December 14
Course Requirements

- Attend all sessions
- Participate in classroom discussions
- Read assigned readings
- Complete all homework assignments. Two homework assignments will be turned in at the beginning of class
- Complete 1 mid-term exam
- Prepare 2 page outline of grant proposal and turn in by October 17.
- Class presentation of grant proposal (November 26- December (final ))
- Final grant proposal (Due by December 12)

Course Grading

<table>
<thead>
<tr>
<th>% of grade</th>
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<tr>
<td>Attendance, class participation, complete all homework</td>
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<tr>
<td>Two homework assignments collected</td>
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<tr>
<td>One Mid-term</td>
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<td>Class presentation</td>
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<td>Final written proposal</td>
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Course Objectives

At the end of the course, students should be able to do the following:

1. Describe a set of causal criteria and give examples of each criterion.

2. Describe the difference between inductive and deductive processes and the role of each in epidemiologic research.

3. Describe the advantages and disadvantages of ecological studies and ecological variables.

4. Discuss the role of variable selection, directed acyclic graphs (DAGs) and model building in the assessment of a causal pathway.

5. Outline the components of an article to assess the methodologic strengths and weaknesses, and to weigh the evidence for and against the research hypothesis.

6. Compare and contrast two articles with opposite findings, and determine which article provides stronger evidence for or against the research hypothesis.

7. Understand the components of a meta-analysis, its usefulness for summarizing multiple studies, and the controversies that surround this approach.

8. Review a set of articles related to a single topic and critically evaluate the weight of the evidence for and against a causal hypothesis.

9. Design a study that assesses a specific causal relationship and improves on the methodological weaknesses of previous studies.
Course Text

NO book, articles posted on D2L

Course Format

At each class session there will be a discussion of the assigned readings and any assigned homework. Homework assignments are to be TYPED and completed before class. Students should make a copy of each homework assignment so that they can refer to it during class discussion in the event that the homework is collected at the beginning of class. Students may confer outside of class when preparing homework, but each student must have a unique set of answers that represent her/his own work. Handing in identically written homework assignments or those authored by previous students will lead to failure of the class by both parties.

Student Project

- Each student will prepare:
  1) A table(s) of relevant published studies related to the student’s research question and bullets points summarizing main points from the table(s).
  2) three sections of a grant proposal (AIMS, SIGNIFICANCE, APPROACH).
- Students will address an unconfirmed causal hypothesis by weighing the evidence for causation in the literature (tables) and by designing a study to further test the hypothesis (grant proposal).
- A two-page outline of the proposal is to be turned in at the end of class on October 17.
- Each proposal will be presented to the class (15 minutes) with a question and answer session to follow (10 minutes). Presentation should include aims, background, and methods. Students are advised to strictly adhere to the 15 minute time limitation. Presenters will be interrupted and points subtracted if the presentation exceeds the time limit.
- The use of power point presentations, overheads, or slides is strongly encouraged for the class presentation.
- Students will incorporate class feed-back from their presentation as they prepare the grant proposal in a final written form (10 pages double-spaced not including references, no less and no more). Pages must be numbered.

Page 1: Aims
Page 2: Significance
Pages 3-10: Approach
Plus Appendix with: Tables of studies, bullet points of key findings/problems, and evaluation with causal criteria
• ANY EVIDENCE OF PLAGARISM IN THE GRANT PROPOSAL WILL RESULT IN A FAILING GRADE. IF YOU ARE UNCLEAR ABOUT WHAT CONSTITUTES PLAGARISM PLEASE CONSULT WITH DR. HOLZMAN

• Students will be expected to follow the Associated Students of Michigan State University (ASMSU) Spartan Code of Honor academic pledge:

“As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do.”
EVALUATION of PRESENTATION

Overall comments:

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Score

1. Overall content of the presentation…………….(7pts) ____.
2. Use of epidemiologic principles………………. (6pts).____.
3. Organization of the material…………………(3pts).____.
4. Speaking style………………………….. (2pts).____.
5. Visual aids …………………………….. (2pts).____.

Total ____