Course Instructors: Dawn Misra, PhD
Dept. Family Medicine & Public Health Sciences, 6135 Woodward, 1st Floor (IBio Building) (313) 577-8199
e-mail: dmisra@med.wayne.edu

Teaching Assistant: Lynnette Essenmacher
e-mail: lessen@med.wayne.edu

Time:
Lecture: Tuesdays 5 - 7:30 pm

Location:
Lecture: Room #3125 Scott Hall

COURSE DESCRIPTION
Applying and extending learning related use of epidemiologic methods in order to assess, analyze and interpret public health data. Students will develop a working knowledge of applied statistical and epidemiologic concepts in order to address public health questions.

OVERVIEW OF COURSE:
The purpose of this course is to reinforce existing knowledge and facilitate new learning about the statistical and epidemiological concepts learned in prior coursework. Specifically, we will cover several topics of relevance to the analysis of public health data. After completion of this course, students will have a working knowledge of essential statistical and epidemiologic concepts. Evaluation is based upon homework (25%), a critique of a published paper (25%), the midterm examination (25%), and the final examination (25%).

TEXTBOOK
Szklo, M, Nieto, FJ. Epidemiology: Beyond the Basics. 3rd ed. Additional readings will be provided as needed.

Learning Objectives
Upon completing this course, a student should be able to:

LO1 Apply knowledge of epidemiologic principles and methods to make recommendations regarding the validity of epidemiologic data.
LO2 Generate and properly express a testable hypothesis.
LO3 Apply analytic assessment tools to a hypothesis test.
LO4 Describe interpretation of factors beyond causality that explain associations.
LO5 Describe the analytic measures associated with screening, including sensitivity, specificity, positive and negative predictive value.
LO6 Learn about research proposals, human subjects’ issues, and research ethics (IRB).
LO7 Learn key elements of writing a scientific report and demonstrate skill by writing a scientific report.
LO8 Be knowledgeable about key data available for public health assessment and research (vital (birth, death) statistics, national surveys).
LO9 Effectively utilize statistical data management and analysis software.
LO10 Identify different types of variables, construct variables, and conduct analyses appropriate to the type of variable and data being supplied.
LO11 Understand and conduct a rigorous critique of literature

General information
My faculty office is in the Integrated Biosciences Center (IBio, 6135 Woodward, 1st Floor). Office hours are by appointment only. Please e-mail with your availability so that I can set aside time for a discussion. As a general rule, if you have any questions about the course, do not hesitate to contact me.
Readings
In addition to the textbook will be provided to you throughout the course as needed. You may also need to refer to textbooks and/or class notes from your biostatistics and epidemiology courses. If you are unable to access these materials, please let me know immediately, since you are responsible for the material covered. Lecture notes will be distributed at the start of each session.

Evaluation
The final grade will be constructed as follows:
- Homework (pass/fail) 25%
- Midterm examination 25%
- Critique of paper 25%
- Final examination 25%

Regular attendance and participation is expected in this course.

Grading scale:
- 93 – 100 = A
- 90 – 92 = A-
- 87 - 89 = B+
- 83 – 86 = B
- 80 – 82 = B-
- 79 and below = C

NOTE: Grades will be rounded up (89.5 is 90). No extra credit will be offered.

Grade Point Average Requirements
A grade of B- or lower is considered unacceptable work by the Graduate School and graduate students must maintain a GPA of 3.00 to remain in good standing. Family Medicine graduate students who receive a B- or lower grade in any core course (including this one) must repeat the course and receive a B or better grade. The student is not eligible to take advanced courses or earn hours toward the project or thesis until the core course deficiency is satisfied. Students who receive lower than a B upon their second attempt will need tutoring and ultimately repeat the course a third time. If still unsuccessful, the student will be dismissed from the program. Students can balance a B- or lower grade in a non-core course with an A- or higher grade in another course, thus maintaining a 3.00 or higher overall GPA. However, Family Medicine students who receive a B- or lower in a core course will be asked to meet with their advisor to insure that they are aware of the Graduate School requirements and to determine if any remedial aid is required. Failure to maintain a GPA of at least 3.00 after such counseling will result in dismissal from the MPH program.

Course Policies

Academic Integrity
Academic Work submitted by a student in the Program is assumed to be his/her own creation. Guidelines to avoid plagiarism and inappropriate paraphrasing in written material using correct methods for citation and quotation are available at the WSU Dean of Students Office (www.doso.wayne.edu/judicial/academic-integrity.htm). When evidence of academic dishonesty is discovered, it will be handled and brought to closure according to WSU policies and procedures (Student Code of Conduct at: www.doso.wayne.edu/judicial/).

Student academic dishonesty refers to behavior that may include plagiarism, cheating, fabrication, falsification of records or official documents, intentional misuse of equipment or materials (including library materials), and aiding and abetting the perpetration of such acts. The preparation of reports, papers, and examinations, assigned on an individual basis, must represent each student’s own effort. Reference sources should be indicated clearly.

Student Accommodation:
"If you have a documented disability that requires accommodations, you will need to register with Student Disability Services for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TTY: telecommunication device for the deaf; phone for hearing impaired students only). Once you have your accommodations in place, I will be glad
to meet with you privately during my office hours to discuss your special needs. Student Disability Services’ mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

Please refer to the SDS website for further information about students with disabilities and the services we provide for faculty and students: http://studentdisability.wayne.edu/

Student Resources:
WSU Writing Center
If you are looking for support in preparing scientific papers, the WSU Writing Center, located on the second floor of the Undergraduate Library, can assist you at all stages of your writing. Their telephone number is 313 577-2544. Appointments and walk in assistance is available. Their web site is: http://www.clas.wayne.edu/unit-inner.asp?WebPageID=1330

Computer access & Blackboard
The class will utilize online interactive modalities. This course requires SPSS, available for free download for students. WSU students are required to have email, internet access and Adobe Acrobat Reader. Blackboard access will require the download of Mozilla as a web browser in order to operate. Go to this link for a free download of the 3.0 version (not 3.5). http://www.mozilla.com/en-US/firefox/all-older.html. Required reading and other course documents will be available in PDF format to assure readability. http://www.blackboard.wayne.edu/wsuauth/

Assignments
All assignments are expected to be handed-in before the end of class on the day they are due. Assignments must be handed in as a hard copy. Electronic submission by email or fax is not acceptable.

Assignments late without permission will be given a lower grade. Requests for permission to hand in a late paper must be submitted in writing. All requests for permission to hand in late assignments must include the date on which you will submit.

There will be 9 homework assignments in addition to a critique of a published paper. Homework assignments are available in the textbook.
Term Paper Assignment: Appraisal of a Published Article

A list of recently published papers involving an etiologic hypothesis that was tested empirically by the authors as well as a PDF of each paper has been posted on Blackboard. Select one of these articles for your appraisal. A copy of the published paper should be submitted along with your term paper. Your term paper should be 6-8 (and must not exceed 10) double-spaced, typed pages (exclusive of cover page, references and figures or tables you wish to include). The final paper is due April 4th.

The exact content of your review will depend on the particular study and the quality of the published paper. The outline presented below should be used but if an item in the outline clearly does not apply to your study, you are not compelled to cover it.

Often it will not be necessary to discuss the entire paper, especially if much of it digresses from the main hypothesis or is not relevant to your critique. Remember that no single empirical study is perfect for establishing a risk factor. Therefore, if you claim there is a potential bias, speculate as to the direction and magnitude of the error. Be sure to indicate in your critique if a point you raise is also raised by the author(s).

In order to complete this assignment, you will need to do a literature search in the library for recent articles on the subject. You may also find standard medical textbooks a good place to begin; use them to direct you to more comprehensive sources of information. You must cite all sources from which you obtain information included in the paper.

When you are discussing an idea which you have read about, you must reference the source within that sentence or paragraph. Failure to do so constitutes plagiarism, a serious offense for which you could be suspended or expelled. Consider the following sentence taken from the paper on reserve by Fortier et al.:

The serum half-life of caffeine is longer in pregnant women than in non-pregnant women (1,2).

In this sentence, Fortier et al. reference two papers (1,2) regarding this statement on caffeine half-life. She has not taken her information verbatim from the source and therefore quotation marks are not necessary but citing the reference is necessary. If I were to incorporate this sentence verbatim (word for word) into my critique of Fortier's paper, I would need to use quotation marks and reference Fortier. Technically, I should have used quotation marks in the above example.

Your points in a paper are valid whether or not they have been made by others before. Your original thoughts cannot be known if you do not properly attribute your sources. However, creativity is not the primary aim of this paper. Epidemiologic and scientific rigor in assessing and evaluating research findings in the literature is the skill which is being graded, not your creativeness. Do not suppress your own ideas as I am sure that many are as valid and interesting as those found in the literature. But, do not allow me to be confused as to which ideas are yours and which stem from other sources or your ideas cannot be appreciated.

Please note that I know the literature well for your paper topics and I will be able to spot poor referencing. Points may be deducted and you could be suspended or expelled for plagiarism. Learning to properly attribute the ideas of others is a critical skill in conducting research.

References should follow a standard style but any style is acceptable so long as it is consistent. If the paper does not follow the correct reference format, points may be subtracted.

Term Paper Assignment: Appraisal of a Published Article

Your review should have three components:

I. Brief **DESCRIPTION** of the study and results as presented by the authors (about 1-2 pages).

   This should include:
   - The *nature, magnitude, and significance* of the problem, and the *objectives* of the study. Specifically state the hypotheses to be tested and the rationale or justification for conducting the study.
   - An overview of the *study design*: type of study, characteristics of the study population, method of selection of study subjects, sources of data, measurement of study variables (exposures, outcomes, confounders), strategies for statistical analysis, etc.
   - A summary of the *findings* and the investigators’ *conclusions* (i.e., their interpretation of the results). Be sure to include findings and conclusions about subgroups of the study population if you and/or the authors think they are important.

II. Balanced **CRITIQUE** of the study (including strengths as well as limitations) and your own conclusions about the study findings (about 4-7 pages).

   This can include, although it is not limited to:
   - **Presentation** -- are the hypotheses, methods, results and/or conclusions clearly described?
   - **Sources of potential bias** -- selection of subjects, appropriateness of comparison group(s), ascertainment of the exposures, outcomes, confounders, etc. Discuss how the sources of bias might have affected the results of this study, especially those points not discussed or addressed by the author(s).
   - **Context** -- to help reach a reasoned judgment, discuss the study and its results in the context of current biological knowledge and results of previous epidemiologic research on the same topic. You should reference a minimum of 2-3 additional journal articles.
   - **Statistical power and Biological/Public Health importance** -- were there enough subjects to reasonably expect to show a difference? If a difference was found, is it biologically meaningful or does it have important public health implications?
   - **Generalizability of the findings.**
   - **Originality of the research** -- are there any new conceptual hypotheses or insights into the etiology of the disease offered by this study? Does the research resolve any preexisting questions about the disease?

III. **RECOMMENDATIONS** (About 1 page)

   Consider the scientific and policy implications of this research. Describe the needs for future research to answer questions not adequately addressed in this study, or new questions raised by the study findings.
<table>
<thead>
<tr>
<th>Week Number</th>
<th>Date</th>
<th>Lecture Topic</th>
<th>Required Readings</th>
<th>Homework Assignments</th>
<th>Other Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Jan 10</td>
<td>Introduction&lt;br&gt;a. Course overview&lt;br&gt;b. Public health data sources</td>
<td>None</td>
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<tr>
<td>Week 2</td>
<td>Jan 17</td>
<td>Basic Study Designs in Applied Epidemiology</td>
<td>Chapter 1</td>
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<tr>
<td>Week 3</td>
<td>Jan 24</td>
<td>Measuring Disease Occurrence</td>
<td>Chapter 2</td>
<td>Ch. 1 Homework</td>
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<tr>
<td>Week 4</td>
<td>Jan 31</td>
<td>Measuring Associations between Exposures and Outcomes</td>
<td>Chapter 3</td>
<td>Ch. 2 Homework</td>
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<tr>
<td>Week 5</td>
<td>Feb 7</td>
<td>Understanding Lack of Validity: Bias</td>
<td>Chapter 4</td>
<td>Ch. 3 Homework</td>
<td>Qualtrics account sign up</td>
</tr>
<tr>
<td>Week 6</td>
<td>Feb 14</td>
<td>Identifying Noncausal Associations: Confounding</td>
<td>Chapter 5</td>
<td>Ch. 4 Homework</td>
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<tr>
<td>Week 7</td>
<td>Feb 21</td>
<td>Defining and Assessing Heterogeneity of Effects: Interaction</td>
<td>Chapter 6</td>
<td>Ch. 5 Homework</td>
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<tr>
<td>Week 8</td>
<td>Feb 28</td>
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<tr>
<td>Week 9</td>
<td>March 7</td>
<td>Stratification and Adjustment: Multivariate Analysis in Epidemiology</td>
<td>Chapter 7</td>
<td>Ch. 6 Homework</td>
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<tr>
<td>Week 10</td>
<td>March 14</td>
<td>SPRING BREAK</td>
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<tr>
<td>Week 11</td>
<td>March 21</td>
<td>Quality Assurance and Control&lt;br&gt;Qualtrics: A Free Web-Based Survey Tool for WSU Affiliates. Guest lecturer: Dr. Rhonda Dailey</td>
<td>Chapter 8</td>
<td>Ch. 7 Homework</td>
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<tr>
<td>Week 12</td>
<td>March 28</td>
<td>Communicating Results of Epidemiologic Studies</td>
<td>Chapter 9</td>
<td>Ch. 8 Homework</td>
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<tr>
<td>Week 13</td>
<td>April 4</td>
<td>Epidemiologic Issues in the Interface with Public Health Policy</td>
<td>Chapter 10</td>
<td></td>
<td>Critique of Published Paper</td>
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<tr>
<td>Week 14</td>
<td>April 11</td>
<td>Discussion of Critiques of Published Papers; Review for Final Examination</td>
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<td>Ch. 9 Homework</td>
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<tr>
<td>Week 15</td>
<td>April 18</td>
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</table>
### Public Health Practice Specialization Competencies linked to Course Learning Objectives

<table>
<thead>
<tr>
<th>Competencies</th>
<th>LO1</th>
<th>LO2</th>
<th>LO3</th>
<th>LO4</th>
<th>LO5</th>
<th>LO6</th>
<th>LO7</th>
<th>LO8</th>
<th>LO9</th>
<th>LO10</th>
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<tbody>
<tr>
<td>1. Integrates the social determinants of health in the design of interventions within public health systems.</td>
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<tr>
<td>2. Applies public health sciences (e.g., biostatistics, epidemiology, environmental health sciences, health services administration, social and behavioral sciences, and public health informatics) in the delivery of the 10 Essential Public Health Services.</td>
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<td>3. Advocates for policies, programs, and resources that improve health in a community (e.g., using evidence to demonstrate the need for a program, communicating the impact of a program)</td>
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<td>4. Utilizes cultural elements and aspects that influence decision making by patients, self, and colleagues</td>
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<td>5. Incorporate analytic public health skills to evaluate programs and reported studies in terms of rigor, importance, and relevance to professional practice</td>
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</table>
**Course Learning Objectives:** By the end of the Applied Epidemiology course students will:

- **LO<sub>1</sub>** Apply knowledge of epidemiologic principles and methods to make recommendations regarding the validity of epidemiologic data.
- **LO<sub>2</sub>** Generate and properly express a testable hypothesis.
- **LO<sub>3</sub>** Apply analytic assessment tools to a hypothesis test.
- **LO<sub>4</sub>** Describe interpretation of factors beyond causality that explain associations.
- **LO<sub>5</sub>** Describe the analytic measures associated with screening, including sensitivity, specificity, positive and negative predictive value.
- **LO<sub>6</sub>** Learn about research proposals, human subjects’ issues, and research ethics (IRB).
- **LO<sub>7</sub>** Learn key elements of writing a scientific report and demonstrate skill by writing a scientific report.
- **LO<sub>8</sub>** Be knowledgeable about key data available for public health assessment and research (vital (birth, death) statistics, national surveys).
- **LO<sub>9</sub>** Effectively utilize statistical data management and analysis software.
- **LO<sub>10</sub>** Identify different types of variables, construct variables, and conduct analyses appropriate to the type of variable and data being supplied.
- **LO<sub>11</sub>** Understand and conduct a rigorous critique of literature.
### Learning Activities and Assignments Linked to Learning Objectives

#### Measurable Outcomes:

<table>
<thead>
<tr>
<th>Assessment Method</th>
<th>Max Points</th>
<th>Instructional Methods</th>
<th>LO1</th>
<th>LO2</th>
<th>LO3</th>
<th>LO4</th>
<th>LO5</th>
<th>LO6</th>
<th>LO7</th>
<th>LO8</th>
<th>LO9</th>
<th>LO10</th>
<th>LO11</th>
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</thead>
<tbody>
<tr>
<td>Homework #1 (individual) Basic Study Designs in Analytical Epidemiology</td>
<td>15 points (combined homework weighted at 25% grade)</td>
<td>Lecture, Reading</td>
<td>X</td>
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<td>Homework #2 (individual) Measuring Disease Occurrence</td>
<td>20 points</td>
<td>Lecture, Reading</td>
<td>X</td>
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<td>Homework #3 (individual) Measuring Associations between Exposures and Outcomes</td>
<td>15 points</td>
<td>Lecture, Reading</td>
<td>X</td>
<td>X</td>
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<td>Homework #4 (individual) Understanding Lack of Validity: Bias</td>
<td>12 points</td>
<td>Lecture, Reading</td>
<td>X</td>
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<td>Homework #5 (individual) Identifying Noncausal Associations: Confounding</td>
<td>8 points</td>
<td>Lecture, Reading</td>
<td>X</td>
<td>X</td>
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<td>Homework #6 (individual) Defining and Assessing Heterogeneity of Effects</td>
<td>12 points</td>
<td>Lecture, Reading</td>
<td>X</td>
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<td>Homework #7 (individual) Stratification and Adjustment: Multivariate Analysis in Epidemiology</td>
<td>28 points</td>
<td>Lecture, Reading</td>
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<td>Homework #8 (individual) Quality Assurance and Control</td>
<td>10 points</td>
<td>Lecture, Reading</td>
<td>X</td>
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<td>Homework #9 (individual) Communicating Results of Epidemiologic Studies</td>
<td>8 points</td>
<td>Lecture, Reading</td>
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<td>Midterm Examination</td>
<td>100 points (25% grade)</td>
<td>In class timed examination</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Critique published paper (individual)</td>
<td>100 points (25% grade)</td>
<td>Lecture, Reading, Homework</td>
<td>X</td>
<td>X</td>
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<td>Final Examination</td>
<td>100 points (25% grade)</td>
<td>In class timed examination</td>
<td>X</td>
<td>X</td>
<td>X</td>
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