Course Data

Number: CPH 205
Title: Introduction to Epidemiology
Department: Epidemiology
School/College: College of Public Health

Course Instructors

<table>
<thead>
<tr>
<th>Name</th>
<th>Office</th>
<th>Phone</th>
<th>Email</th>
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<tbody>
<tr>
<td>&lt;name&gt; Course Director</td>
<td>&lt;office&gt;</td>
<td>&lt;phone&gt;</td>
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The course instructors welcome conversations with students outside of class. Students may correspond with instructors by email or set up appointments by contacting <name> at <phone> or <email>.

Students should also contact <same name> with questions they might have regarding the mechanics or operation of the course.

Course Rationale

This course is a study of the distribution and determinants of disease and injury. Applications of epidemiology to Public Health practice will be emphasized. There is not a prerequisite for this course.

Course Objectives

By the end of the semester, the student will be able to:
1. Utilize the basic terminology and definitions of epidemiology to define public health problems in terms of magnitude, person, place, and time
2. Identify and comprehend key sources for epidemiologic data
3. Calculate and use basic epidemiologic measures to make relevant inferences for illuminating public health issues
4. Assess & understand public health issues as determinants of population health and illness
5. Comprehend appropriate methods for epidemiologic research
6. Communicate epidemiologic information to diverse audiences

ASPH Competencies Addressed in this Course

Epidemiology
- Explain the importance of epidemiology for informing scientific, ethical, economic, and political discussion of health issues
- Apply the basic terminology and definitions of epidemiology
- Describe a public health problem in terms of magnitude, person, time, and place
- Identify key sources of data for epidemiologic purposes
- Identify the principles and limitations of public health screening programs
- Calculate basic epidemiologic measures
- Draw appropriate inferences from epidemiologic data
- Evaluate the strengths and limitations of epidemiologic data
- Communicate epidemiologic information to lay and professional audiences
- Comprehend basic ethical and legal principles pertaining to the collection, maintenance, use, and dissemination of epidemiologic data

**Course Content**

*IMPORTANT NOTE: The schedule and topics may change as the course unfolds. Changes will be posted on Blackboard.*

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Description of Content</th>
<th>Friis/ Sellers Text</th>
<th>Supplemental readings: Principles of Epidemiology</th>
<th>Assignments Due</th>
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<tbody>
<tr>
<td>1</td>
<td>Course Overview: The History &amp; Scope of Epidemiology</td>
<td>An introduction to the course and instructor expectations; Presentation of Epidemiology definitions (determinants, distribution, population, health phenomena, morbidity &amp; mortality), foundations &amp; historical antecedents (Graunt, Jenner, Snow, &amp; Farr), and recent applications (Framingham Heart Study).</td>
<td>Ch. 1 &amp; 16</td>
<td>Ch. 1 p. 1-11</td>
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<tr>
<td>2</td>
<td>Practical Applications of Epidemiology: prevention, causality</td>
<td>A review of the uses and applications of epidemiology (trends: disappearing, residual, persisting &amp; new epidemic disorders), and the influence of population dynamics on community health (population terms: fixed vs. dynamic). Introduction to Healthy People 2010; Concepts of Causality vs. risk factors; Primary, Secondary &amp; Tertiary Prevention.</td>
<td>Ch. 2</td>
<td>Ch. 1 p. 12-28</td>
<td>Media Article Essay p.44 #7</td>
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<td>3</td>
<td>Measures of Disease Frequency: Morbidity and Mortality, Summarizing data</td>
<td>This session will present definitions and ways to distinguish between counts, ratios, proportions, &amp; rates; incidence &amp; prevalence. Students will identify and calculate commonly used rates for morbidity, mortality and natality. Limitations of crude rates will be discussed and alternative measures identified. Application of direct and indirect methods to adjust rates will be introduced along with discussion of situations where each method should be used.</td>
<td>Ch. 3</td>
<td>Ch. 1 p. 30 Ch. 2 p. 2-58 Ch. 3</td>
<td>HW /Study Problems</td>
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<td>4</td>
<td>Descriptive Epidemiology: Person, Place &amp; Time Displaying Public Health data</td>
<td>Identification of person, place &amp; time characteristics and how they are associated with variations in health and disease. Describe the difference between secular trends and cohort effects. Introduction to tables and graphs and data types (nominal, ordinal, discrete, continuous); 2X2 Contingency tables.</td>
<td>Ch. 4</td>
<td>Ch. 1 p. 31-44 Ch. 1 p.75-80 Ch. 4 p.1-72 Ch. 5 p.23-32</td>
<td>HW /Study Problems</td>
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<td>5</td>
<td>Sources of Data, Surveillance</td>
<td>Discussion on criteria for assessing the quality and utility of epidemiologic data including the uses, strengths, and weaknesses of various data sources. Identify privacy and confidentiality issues that pertain to epidemiologic data. Identify key sources of data for epidemiologic purposes</td>
<td>Ch. 5</td>
<td>Ch. 5 p. 5-21 Ch. 5 p. 38 - 56</td>
<td>Paper: Descriptive Epidemiology of a Selected health problem (p. 201, 202)</td>
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<td>6</td>
<td>Study Designs: Ecologic, Cross-sectional, Case-control</td>
<td>A review of the main characteristics, advantages, and disadvantages of ecologic, cross-sectional, and case control studies. (Ecologic fallacy, sources of study subjects, type of population, directionality) Measures of association: 2X2 Tables, How to</td>
<td>Ch. 6</td>
<td>Ch. 1 p. 47 -50</td>
<td>HW /Study Problems</td>
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<tr>
<td>EXAM</td>
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<td>7</td>
<td>Overview of Study designs; Study Designs: Cohort Studies, Experimental study design; randomization, blinding</td>
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<td>8</td>
<td>calculate and interpret an odds ratio. Define the basic difference between observational &amp; experimental studies.</td>
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<td>9</td>
<td>Measures of Effect, Causality</td>
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<td>10</td>
<td>Data Interpretation, Disseminating data, How to critique an Article, Bias, Confounding</td>
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<td>11</td>
<td>Screening for Disease</td>
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<td>12</td>
<td>Infectious Disease Epidemiology; Epidemic curves; Outbreak Investigation</td>
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<td>13</td>
<td>Chronic Disease, Molecular &amp; Genetic, Psychologic, Behavioral, and Social Epidemiology</td>
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<td>14</td>
<td>Occupational &amp; Environmental Epidemiology</td>
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**EXAM 1**

**Hierarchy of study designs:** A review of characteristics, advantages & disadvantages of cohort studies. How to calculate & interpret a relative risk. Experimental & intervention studies (randomization, blinding, placebo, & ethical aspects of human experimentation, type of population in longitudinal study: fixed or dynamic); Years of potential life lost (YPLL), survival curves.

**EXAM 2**

**Explain the meaning of absolute and relative effects:** Calculate and interpret risk difference, population risk difference, relative risk, etiologic fraction, population etiologic fraction, Define the role of statistical tests in epidemiologic research; Statistical measures of effect: significance tests, the p value, confidence interval Null hypothesis; Models of causal relationships.

**EXAM 3**

**Sources of error in epidemiologic research:** distinguish between random and systematic errors; Identify techniques to reduce bias at the design and analysis phases of a study; define confounding and provide examples and methods that can be used to control confounding.

**EXAM 4**

**Identify appropriate situations for screening tests and programs:** characteristics of a good screening test, evaluation of screening tests & programs; sources of unreliability and invalidity; measures of validity of screening tests; the relationship between specificity and sensitivity.

**EXAM 5**

**State modes of infectious disease transmission:** The role of the Epidemiologic triangle (agent, host, environment) as a model to explain the occurrence of disease outbreaks. Define three categories of infectious disease agents; identify the characteristics of agents (infectivity, pathogenicity, virulence, incubation period). Define quantitative terms used in infectious disease outbreaks; Describe the procedure for investigating a disease outbreak. Identify the difference in epidemic curves: Common point source, common persistent source, common intermittent source, and propagated source.

**EXAM 6**

**Discuss an aging population and the impact on chronic diseases:** Chronic disease challenges; death trends, risk factors, disease burden: Cancer, Cardiovascular Disease, Diabetes; Methods in chronic disease epidemiology; Introduction to Molecular & Genetic, Psychologic, Behavioral, and Social epidemiology.

**EXAM 7**

**Environmental Epidemiology defined; Examples of health effects associated with environmental hazards, environmental exposures and human responses to exposure:** Cite health outcomes studied

**EXAM 8**

**Ch. 7 & 8**

**Ch. 9**

**Ch. 3 p. 48 - 51**

**Ch. 10, Appendix A**

**Ch. 11**

**Article Critique, Disseminating data Presentation**

**Ch. 12**

**Ch. 1 p. 52 – 68**

**Ch. 6 p. 61 – 63**

**HW/Study Problems**

**HW/Study Problems**

**HW/Study Problems**

**HW/Outbreak Investigation**

**HW/Study Problems**

**HW/Study Problems**

**HW/Study Problems**
in relation to environmental agents; Study designs
used in environmental epidemiology; types of
agents; Discuss methodologic difficulties with
research on environmental health effects.

| 15 | Epidemiology as a profession; Review | Epidemiology as a profession will be examined including the ethical guidelines: areas of specialization, career roles, resources for education and employment in epidemiology; competencies required in the field of epidemiology. | Ch. 16 | HW/Study Problems |

**Instructional Strategies**

1. All students will be expected to attend class, to participate in class by completing and discussing the assigned readings, and to complete two examinations.
2. All students will complete homework assignments.
3. All students will complete a culminating Outbreak Investigation.

**Instructional Resources**

*Required Text*

*Online resource*

*Other Required or Suggested Reading*

**Assessment and Evaluation**

**Grading**

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<tr>
<th>Requirement</th>
<th>Points</th>
<th>Grading Scale</th>
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<tbody>
<tr>
<td>2 Exams @ 100 Points Each</td>
<td>200</td>
<td>A 90-100%</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>100</td>
<td>B 80-89.9%</td>
</tr>
<tr>
<td>Descriptive Epidemiology Paper</td>
<td>100</td>
<td>C 70-79.9%</td>
</tr>
<tr>
<td>Outbreak Investigation</td>
<td>25</td>
<td>D 60-69.9%</td>
</tr>
<tr>
<td>Health Data Dissemination Presentation</td>
<td>25</td>
<td>F &lt;60%</td>
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<tr>
<td>Media Article Essay</td>
<td>25</td>
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<tr>
<td>Article Critique</td>
<td>25</td>
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<td>Total</td>
<td>500</td>
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**Administrative Comments**

**Attendance Policy**

1. Regular class attendance is expected of all students.
2. A student missing twenty percent or more of the hours the class meets shall be assigned an "F" grade. This policy may be waived by the instructor, but only when at least half the absences are due to participation in approved University activities or legitimate medical excuses.

3. In the event of an unavoidable absence, the student should meet the instructor’s terms for "make-up" procedures, but the responsibility for initiating make-up work rests with the student.

5. Attendance regulations shall begin with the first scheduled meeting of the class regardless of when the student enrolls.

**Due Date Policy**

Assignments are due at the **beginning of class** on the posted due date (see COURSE SCHEDULE). In fairness to the other students who work hard to meet expectations and deadlines, a "late tax" will be imposed at a rate of 20% per day (starting at the **beginning of class** on the posted due date. This heavy late penalty is meant to emphasize the importance of effective time management and the need to begin work on the next module. Although students usually have good reasons for running late, in fairness to the entire class this late tax will be imposed impartially.

**Technical Issues**

Students will need use of the following software for successful completion of assignments: Microsoft Word, Microsoft PowerPoint, Adobe Reader, and Blackboard. It is the student's responsibility to maintain the course communications technology in functioning order, e.g., your email or access to the Internet. Technical problems are not acceptable excuses for late or unreadable submissions. The system can be accessed via the internet at the following website (http://ecourses.uky.edu or through the link blue portal).

**Inclement Weather**

This course will adhere to the University’s policy and decisions regarding cancellation or delayed class schedules. Adjustments will be made to the class schedule as necessary to take into account any delays or cancellations of this class. Local television and radio stations broadcast University delays or closings. The University web site may also provide delays or closings information.

**Grievances**

Students who have grievances regarding the course should contact the course director. If students are not satisfied with the response, they should seek guidance from the Dean of the Graduate School or the Dean of the school or college providing the course.

**Disabilities**

If a student has a documented disability that requires academic accommodations, please see the Course Director as soon as possible during scheduled office hours. To receive accommodations in this course, students must provide the Course Director with a Letter of Accommodation from the Disability Resource Center (http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/). If a disabled student has not already done so, that student should please register with the Disability Resource Center (Room 2 Alumni Gym, 257-2754, jkarnes@uky.edu) for coordination of campus disability services available to students with disabilities.
**Academic Honesty**

Students are expected to be fully aware of their responsibility to maintain a high quality of integrity in all of their work. All work must be the student’s own, unless collaboration is specifically and explicitly permitted as in the course group project. Any unauthorized collaboration or copying will at minimum result in no credit for the affected assignment and may be subject to further action under the University Guidelines for Academic Integrity. Students are required to comply with the academic honesty policies of the University. These policies prohibit plagiarism, cheating, and other violations of academic behavior. For a full description of the University’s Academic Integrity policy refer to the following website: [http://www.uky.edu/StudentAffairs/Code/](http://www.uky.edu/StudentAffairs/Code/) and Section 6.3 of the University Senate Rules ([http://www.uky.edu/USC/Section VI.pdf](http://www.uky.edu/USC/Section VI.pdf))