

**HCSV 463 Epidemiology Fall 2006\***  
**Department of Health and Community Services, California State University, Chico**  
**Professor Tomita**

|                                 |  |
|---------------------------------|--|
| Course: HCSV 463-01             | Office Location: Butte 604   |
| TRACS Call #: 1333              | Office Hours: M 12-2pm & By Appt.  |
| Class Meeting Times: M 2-4:50pm | Ph. 530-898-4417 / Fax. 530-898-5107   |
| Room: Plumas 106                | E-Mail: <a href="mailto:mtomita@csuchico.edu">mtomita@csuchico.edu</a>                 |
|                                 | URL: <a href="http://www.csuchico.edu/~mtomita/">http://www.csuchico.edu/~mtomita/</a> |

**Course Materials**

1. **(REQUIRED)**. Merrill, R. M., and Timmreck, T. C. (2006). An introduction to epidemiology (4th ed.). Boston, MA: Jones and Bartlett Publishers. ISBN 0-7637-3582-5
2. (OPTIONAL). Oakes, J. M., and Kaufman, J. S. (2006). Methods in social epidemiology. San Francisco: Jossey-Bass. ISBN 0-7879-7989-9.
3. (OPTIONAL). This course is also on CD-ROM. The disc will be distributed the first day of class.
4. Course Syllabus ([RTF](#))
5. Course Learning Objectives in MS Word Rich Text Format ([RTF](#))

**Weekly Lecture Topics and Assignments**

| Week          | Lessons**  | Assignment  |
|---------------|--|---|
| 1<br>Aug 21   | Course Overview and Introduction<br>Foundations of Epidemiology<br>Practical Disease Concepts in Epidemiology<br>Epidemiology of Anthrax<br><br><b>SUBSCRIBE TO WEBCT</b>                              | Chapter 1 ( <a href="#">PDF</a> )<br>Chapter 2 ( <a href="#">PDF</a> )<br>Anthrax Video ( <a href="#">WMV</a> )<br>History of Bioterrorism- Complete ( <a href="#">WMV</a> )- includes all disease video segments below<br><b>Group Assignment: Learning Objectives Group Worksheet (<a href="#">RTF</a>)</b> |
| 2<br>Aug 28   | Selected Historical Developments of Epidemiology<br>Epidemiology of Plague<br>Epidemiology of Cholera  | Chapter 3 ( <a href="#">PDF</a> )<br>Plague ( <a href="#">PDF</a> ), Video ( <a href="#">WMV</a> )<br>Cholera ( <a href="#">PDF</a> )   |
| 3<br>Sept. 11 | Epidemiological Measures of Health Status: Mortality — Rates and Ratios<br>Epidemiology of Influenza, H5N1 avian influenza   | Chapter 4 ( <a href="#">PDF</a> )<br><b>Group Assignment: Computation 1</b><br>Influenza ( <a href="#">PDF</a> ), Video H5N1  |
| 4<br>Sept. 18 | Epi Measures of Health Status: Morbidity-- Rates and Ratios<br><br><b>Exam 1</b> (Exam covers- Chapters 1-5, anthrax, plague, cholera, influenza, H5N1 avian influenza, lecture notes not in textbook) | Chapter 5 ( <a href="#">PDF</a> )<br><b>Group Assignment: Computation 2</b>   |
| 5<br>Sept. 25 | <i>Exam 1 Review</i><br>Vital Stats & Health Status Indicator<br>Epidemiology of Small Pox   | Chapter 6 ( <a href="#">PDF</a> )<br>Small Pox ( <a href="#">PDF</a> ), Video ( <a href="#">WMV</a> )   |

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| Week          | Lessons**  | Assignment  |
|---------------|--|---|
| 6<br>Oct 2    | Descriptive Statistics in Epidemiology<br>Epidemiology of Tuberculosis<br>Epidemiology of Hansen's Disease   | Chapter 7 ( <a href="#">PDF</a> )<br>TB ( <a href="#">PDF</a> ), TB Surveillance ( <a href="#">PDF</a> )<br>Hansen's ( <a href="#">PDF</a> ), <a href="#">Video: Leprosy</a>  |
| 7<br>Oct. 9   | Obesity and Poverty<br>Research Methods, Study Design, Analytic Studies  | Obesity Maps ( <a href="#">PDF</a> ), Handout<br>Chapter 8 ( <a href="#">PDF</a> )<br><a href="#">Group Assignment: TBA</a>   |
| 8<br>Oct. 16  | Social Epidemiology  | Handout, Readings<br><a href="#">Group Assignment: TBA</a>  |
| 9<br>Oct. 23  | <a href="#">Exam 2</a> (Exam covers - Chapters 6-8, small pox, TB, Hansen's disease, obesity and poverty, research methods, study design, analytic studies, descriptive statistics in epidemiology, vital stats & health status indicator, social epidemiology)<br>Epidemiology of Dengue Fever/Dengue Hemorrhagic Fever | Dengue 1 ( <a href="#">PDF</a> ), 2 ( <a href="#">PDF</a> ), 3 ( <a href="#">PDF</a> )<br>Dengue Brochure- Hawaii ( <a href="#">PDF</a> )   |
| 10<br>Oct 30  | <i>Exam 2 Review</i><br>Time, Place, and Person<br>Epidemiology of West Nile<br><br>Epidemiology of Tularemia<br>Epidemiology of SARS  | Chapter 9 ( <a href="#">PDF</a> )<br>West Nile ( <a href="#">PDF</a> ), Video 1 ( <a href="#">RAM</a> ),<br>Video 2 ( <a href="#">MOV</a> )<br>Tularemia ( <a href="#">PDF</a> ), Video ( <a href="#">WMV</a> )<br>SARS ( <a href="#">PDF</a> ) |
| 11<br>Nov. 6  | Observational Methodology, Association, and Causality<br>Development<br>Epidemiology of Bioterrorism<br>Developing and Conducting Investigations and Studies<br><br><a href="#">Exam 3</a> (Exam covers - Chapter 9-11, dengue fever/dengue hemorrhagic fever, west nile, tularemia, SARS, epidemiology of bioterrorism) | Chapter 10 ( <a href="#">PDF</a> )<br><br>Bioterrorism ( <a href="#">PDF</a> )<br>Public Health Surveillance ( <a href="#">PDF</a> )<br>Chapter 11 ( <a href="#">PDF</a> )  |
| 12<br>Nov. 13 | Behavioral and Chronic Disease Epidemiology<br>Biology Review<br>Genomics, Health Disparities and Epidemiology   | Chapter 12 ( <a href="#">PDF</a> )<br>Handout, Readings<br>Handout, Readings  |
| Nov 20        | <b>Thanksgiving Break- No Class</b>  |   |
| 13<br>Nov. 27 | Genomics, Health Disparities and Epidemiology <i>cont.</i>   | Handout, Readings   |
| 14<br>Dec. 4  | Environmental Epidemiology   | Handout, Readings   |
| <b>TBA</b>    | <b>Exam 4</b> (Exam covers – Chapter 12, biology review, genomics, health disparities, and epidemiology, environmental epidemiology)   |   |

\* This course requires Internet use. Students must access WebCT at least twice per week during the semester.

\*\* Infectious diseases, social, environmental, and genomics epidemiology lessons and videos are integrated into the lectures where appropriate. You are responsible for the materials covered in these topical lessons in infectious disease and social epidemiology, and epidemiology-related movies. Students may be assigned to attend pertinent activities around campus.

## **WEBCT REQUIREMENTS**

1. Subscribe to WebCT course first week of classes. Check WebCT at least twice per week for information from the professor.
2. Browse the following web sites to familiarize yourself with where epidemiological information may be found:

## **COURSE GRADE**

Your course grade will be computed as follows: Four Exams (100 points each), Group Assignments (Five assignments, 50 points total), Article Critiques (Two critiques, 20 points total). Total course points= 470. Grading percentages: A=93-100%; A-=90-92%; B+=87-89%; B=83-86%; B-=80-82%; C+=77-79%; C=73-76%; C-=70-72%; D+=67-69%; D=63-66%; D-=60-62%; F=<60%. Course grades MAY be curved at the discretion of the professor.

## **CLASS EXPECTATIONS**

1. Please be on time for class. Attendance is taken, and points will be accumulated for each day of attendance. Class will start promptly at the designated class time. The class is always disrupted when people enter late. Please be courteous to your classmates and professor and not interrupt the lectures. If you should enter class late, sit near the doorway to minimize disruption to the class lecture.
2. During exams: All CSU Chico rules regarding testing are in effect. See Code of Student Rights and Responsibilities at <http://www.csuchico.edu/sjd/discipline/studentRights.html>.
3. College students are expected to be polite, courteous, and cordial with their fellow students and professors.
4. College students are expected to take responsibility for their actions. For example, if you are absent on the day of a quiz, you will receive zero points for the quiz. Lengthy justifications and excuses about why you missed the quiz will not be accepted. Pace yourself and plan ahead: Stress due to setting unrealistic educational goals (e.g., taking too many classes and doing too much outside of class) causes students to become sick during examination periods. Also, late assignments will not be accepted. Each student must fulfill their responsibilities and hand in assignments on the due date.
5. **STUDY HINTS:** Before each class period, review the assigned readings and be prepared for class. If you do not have time to read the entire chapter before class, at the very least read the Chapter Summary in your textbook and any exercises. After attending class, go back over your notes at home and read the assigned readings again. Focus on what was discussed in class AND whatever table or figure you were told to study. You should be spending a minimum of three hours of studying for every hour of class time per week.
6. You are expected to take written notes. Laptop computers and electronic recording devices are not permitted in class. You may tape record lectures ONLY if you are blind/visually impaired AND have my permission to do so. If you should miss a class, please find out from your classmates what was covered.
7. During class: 1) Turn off all pagers and cell phones before class starts. Ringing cell phones and pagers are very disruptive to the class and will not be tolerated. Students with ringing cell phones or pagers (that includes vibrating pagers) will be asked to leave the classroom if it is a persistent problem, 2) You may not go in and out of the classroom to the bathroom, to get a soda, and so on. Plan ahead and go to the bathroom before you come to class, 3) It is rude and disrespectful of students to talk to one another while someone is speaking (the professor, guest speaker, a student discussing a point). Students who are interrupting the class by talking to one another will be asked to leave the room, 4) Do not bring food into the classroom. Water bottles are OK, as long as the bottles are reasonable in size.
8. Discussion of your quizzes, assignments, and grades will not be done over the telephone, fax, or e-mail. You must make an appointment to see me in person.
9. On the day of the Final Exam, bring two No. 2 pencils. Do not call the secretaries or the department after the exam for your grades. Grades are submitted electronically, thus, you should be able to view your grades through Portal.
10. Students with recognized disabilities are responsible to inform me about their needs for this course. Please refer to the Handbook ([http://www.csuchico.edu/dss/student\\_handbook.htm](http://www.csuchico.edu/dss/student_handbook.htm)). You must identify your recognized disabilities prior to taking any quiz, and the Disability Support Services Office will contact me in writing. Student with recognized disabilities may receive up to twice the amount of time to complete a quiz/exam.

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## **INTRODUCTION TO EPIDEMIOLOGY**

### **Course Information from CSUC Catalog**

**Course Code/Number:** HCSV 463

**Course Title:** Epidemiology

**Credits/Semester Offered:** 3.0 Fall/Spring

**Prerequisites:** HCSV 160, MATH 005

**Course Description:** Study of the patterns of the major chronic and infectious diseases. Both individual- and populationbased approaches to prevention and control will be examined.

### **Course Objectives**

*At the completion of the course, the student will be able to:*

1. Discuss the foundations of epidemiology.
2. Identify and discuss research methods and processes used in epidemiology.
3. Discuss how epidemiology may be useful in professional practice as health educators and administrators.
4. Discuss the pathogenesis and epidemiology of health topics covered during that semester.

### **PowerPoint Presentations**

The PowerPoint Presentations for each week's lectures and discussions are outlines of what is being taught, and is not meant to be comprehensive. You will not be able to pass this course by merely reading the presentations. You must still read your textbook. Most of each week's information will come from lectures and discussions in class and information sent to students by the professor via WebCT.

### **Detailed Learning Objectives**

Learning objectives are helpful for students to understand what materials are important, and what materials they will be tested on. Course content and educational evaluation methods are based upon the learning objectives. To study for exams, it is always helpful to refer to these learning objectives as a guide. Remember that the exams are based upon your assigned readings, lectures, and computer assignments. This means you will have to buy and read the textbook and take notes in class.

Chapters 1-3 introduce you to field of epidemiology. You will learn basic concepts and shown examples of how epidemiologists solved problems of what caused diseases, disabilities, or death. There are a lot of terms to learn.

**STUDY HINT:** Make a list of terms and definitions to study for the exam. Use the list of objectives below to make study outlines for each chapter. Use outlines to study for the exam. Before you begin reading the learning objectives below, note that the objectives are written using Bloom's taxonomy. The table below identifies the level of understanding expected in this course. The levels of understanding are progressively more complex, from basic Knowledge to Evaluation. The terms Define, discuss, identify, review, and demonstrate, for example, identify what you must be able to accomplish on each exam to demonstrate that you learned something. We will cover more about how to use learning objectives to study for any college course. **THE SET OF LEARNING OBJECTIVES BELOW IS YOUR STUDY GUIDE!!**

**Bloom’s Taxonomy**  
**Benjamin Bloom: Structure of Knowledge Overview**

| <b>Knowledge</b> | <b>Comprehension</b> | <b>Application</b> | <b>Analysis</b> | <b>Synthesis</b> | <b>Evaluation</b> |
|------------------|----------------------|--------------------|-----------------|------------------|-------------------|
| <b>DEFINE</b>    | restate              | translate          | compose         | distinguish      | judge             |
| memorize         | <b>DISCUSS</b>       | interpret          | analyze         | plan             | appraise          |
| repeat           | describe             | apply              | differentiate   | propose          | evaluate          |
| record           | recognize            | employ             | appraise        | design           | rate              |
| list             | explain              | use                | calculate       | formulate        | value             |
| recall           | express              | <b>DEMONSTRATE</b> | experiment      | arrange          | revise            |
| name             | <b>IDENTIFY</b>      | dramatize          | test            | assemble         | score             |
| relate           | locate               | practice           | compare         | collect          | select            |
| know             | report               | illustrate         | contrast        | construct        | choose            |
|                  | <b>REVIEW</b>        | operate            | criticize       | create           | assess            |
|                  | tell                 | schedule           | diagram         | set up           | estimate          |
|                  |                      | shop               | inspect         | organize         | measure           |
|                  |                      | sketch             | debate          | manage           |                   |
|                  |                      |                    | inventory       | prepare          |                   |
|                  |                      |                    | question        |                  |                   |
|                  |                      |                    | relate          |                  |                   |
|                  |                      |                    | solve           |                  |                   |
|                  |                      |                    | examine         |                  |                   |

**Computer Assignments**

All students are expected to acquire a set of computer competencies related to epidemiology. All computer

**Computer Assignments**

All students are expected to acquire a set of computer competencies related to epidemiology. All computer procedures and instructions are located at WebCT.

*By the end of the course, the student will be able to:*

1. Demonstrate use of e-mail to communicate between the professor and fellow students.
2. Demonstrate use of a web browser to access epidemiological resources.
3. Identify web sites where epidemiological resources may be found (national and state mortality, morbidity, and vital statistics information).
4. Identify what epidemiological data may be obtained from the following web sites:

**Web Site URL**

|                                       |   |
|---------------------------------------|---|
| National Center for Health Statistics | <a href="http://www.cdc.gov/nchs/">http://www.cdc.gov/nchs/</a> |
| US Census Bureau                      | <a href="http://www.census.gov/">http://www.census.gov/</a>     |
| Pan American Health Organization      | <a href="http://www.paho.org/">http://www.paho.org/</a>         |
| World Health Organization             | <a href="http://www.who.int/">http://www.who.int/</a>           |
| United Nations Children’s Fund        | <a href="http://www.unicef.org/">http://www.unicef.org/</a>     |

6. Identify where epidemiological data may be obtained on Butte County and California State.

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## **Chapter 1 Foundations of Epidemiology**

*By the end of the lesson, the student will be able to:*

1. Define the following epidemiologic terms: epidemiology, epidemiologist, etiology, inductive and deductive reasoning, endemic, hyperendemic, holoendemic, epidemic, pandemic, prevalence vs. incidence, epidemiology triangle, multiple causation, agent, host, pathogen, environment.
2. Identify the seven uses of epidemiology.
3. Discuss disease transmission concepts using the following terms: fomite, vector, reservoirs, carrier (active, convalescent, healthy, incubatory, intermittent, passive).
4. Identify modes of disease transmission and discuss one disease example for each: direct (person-to-person) transmission, indirect transmission (airborne, vehicleborne, foodborne, vectorborne), mechanical transmission, biologic transmission.
5. Explain the chain of infection.
6. Explain the classes of epidemic outbreaks.
7. Explain levels of health care (primary, secondary, tertiary).
8. Explain levels of prevention (primary, secondary, tertiary).

## **Chapter 2 Practical Disease Concepts in Epidemiology**

*By the end of the lesson, the student will be able to:*

1. Define the following epidemiologic terms: disease, pathogens, pathogenesis, pathogenic, pathogenicity, virulence, invasiveness, transmission, etiology, causality, association, toxins, toxicity, communicability, incubation, virulence, viability, zoonosis.
2. Identify and explain the three levels of disease: acute, subacute, chronic.
3. Explain the immune system response to a pathogen (immunity, active immunity, passive immunity).
4. Explain the natural course of a communicable disease.
5. Identify and explain the five major classifications of diseases (congenital and hereditary, allergies and inflammatory, degenerative and chronic, metabolic, cancer/neoplastic).
6. Identify classification of sources of disease or illness (allergies, chemical, congenital, hereditary, iatrogenic, idiopathic, infectious, inflammatory, metabolic, nutritional, physical agents, psychological, traumatic, tumors, vascular).
7. Identify various sources of disease (microorganisms, animals, inanimate), and match the source with the respective disease.
8. Identify ten portals of entry of infectious disease agents.
9. Explain incubation periods in infectious disease process (prodromal period, fastigium period, defervescence, convalescence, defecation).
10. Discuss how the International Classification of Diseases (ICD), established by the World Health Organization, is applied in the epidemiology.
11. Discuss the Notifiable disease reporting system as used in the USA.
12. Explain what is herd immunity.
13. Explain what communicable disease prevention and control measures are employed by the public health departments.
14. Explain how noncommunicable and chronic diseases are classified, and what prevention and control measures are used in public health.
15. Explain what is Healthy People 2010.

## **Chapter 3 Selected Historical Developments of Epidemiology**

*By the end of the lesson, the student will be able to:*

1. Discuss the contributions of John Snow, Louis Pasteur, Robert Koch, and Florence Nightengale to the field of epidemiology.

## **SPEAKING THE LANGUAGE OF EPIDEMIOLOGISTS**

Chapters 4-7 introduce you to the language of epidemiologists. Epidemiologists use various tools to evaluate a person's risk for disease, disability, or death. You will need to know what measures (tools) epidemiologists use to characterize a person's health status (mortality, morbidity, vital statistics, and other indicators). As you will see, epidemiologists are like detectives using clues to solve a puzzle. Many of the clues are expressed as statistics, where rates, ratios, and other numbers are calculated, analyzed, patterns are identified, and conclusions are drawn.

### **Chapter 4 Epidemiological Measures of Health Status: Mortality—Rates and Ratios**

*By the end of the lesson, the student will be able to:*

1. Define the following epidemiologic terms: mortality, rate (crude, adjusted, specific), ratio, proportion, prevalence, percentile, percentage, rate ratio, true rate, odds ratio, birth certificate, death certificate, crude death rate, infant mortality, age adjusted death rate, standard population.
2. Explain how the Vital Statistics Registration System in the US functions.
3. List the top causes of death worldwide.
4. Explain how death rates are adjusted for race, religion, gender, and marital status.
5. Define years of potential life lost and explain how this statistic is used in epidemiology.
6. Identify parts of a mortality table used in epidemiology.
7. Interpret a mortality table used in epidemiology.
8. Identify parts of a mortality graph used in epidemiology.
9. Interpret a mortality graph used in epidemiology.
10. Explain how mortality statistics may be useful to health educator and health administrators.
11. Calculate and graph mortality rates and ratios.

### **Chapter 5 Epidemiological Measures of Health Status: Morbidity—Rates and Ratios**

*By the end of the lesson, the student will be able to:*

1. Define the following epidemiologic terms: morbidity, incidence rates, cumulative incidence rates, force of morbidity, per person incidence rate, risk, population at risk, risk ratio, relative risk, attributable risk, attack rates, secondary attack rates, OSHA, prevalence, prevalence rates, period prevalence, point prevalence, odds ratio.
2. Discuss the three key morbidity rates (incidence, prevalence, and attack rates).
3. Discuss how risk (risk ratio, relative risk, attributable risk, risk factors) is used in morbidity statistics.
4. Discuss how prevalence is used as a measure in morbidity statistics.
5. Explain the two epidemic types (common source and propagated/progressive).
6. Identify the various approaches to odds ratio (prevalence, cross-product, exposure, disease, and risk).
7. Discuss the five sources of morbidity statistics (communicable disease reports, clinical and hospital records, institutional and industrial records, health and disease surveys, ongoing observations of incidence of illness in a population).
8. Identify parts of a morbidity table used in epidemiology.
9. Interpret a morbidity table used in epidemiology.
10. Identify parts of a morbidity graph used in epidemiology.
11. Interpret a morbidity graph used in epidemiology.
12. Explain how morbidity statistics may be useful to health educator and health
13. Calculate and graph morbidity rates and ratios.

### **Chapter 6 Epidemiology Vital Statistics and Health Status Indicators**

*By the end of the lesson, the student will be able to:*

1. Define the following epidemiological terms: vital statistics, health status, census, ethnic, racial, intercensal, Standard Metropolitan Statistical Area (SMSA), registration (births, deaths, marital status, abortion, notifiable disease, select communicable diseases), birth rate, crude birth rate, NHANES.
2. Discuss how vital statistics are used in epidemiology.
3. Examine vital statistics of Butte County, California obtained from the US Census, U.S. National Center for Health

Statistics, and California Center for Health Statistics.

4. Identify major vital events (births, deaths, marriages, divorces), and discuss how such data helps to determine the health status of a community.
5. Explain how vital statistics and health status indicators may be useful to health educators and health administrators.
6. Calculate and graph birth rates.

### **Chapter 7 Descriptive Statistics in Epidemiology**

*By the end of the lesson, the student will be able to:*

1. Define the following epidemiological terms: descriptive statistics, levels of measurements (nominal, ordinal, interval, ratio), parametric, nonparametric, measures of central tendency (mean, median mode), measures of dispersion- range, standard deviation, graphs (histogram, bar, column, pie), percentile ranking, proportion, z-score.
2. Discuss the role of descriptive statistics in epidemiology.
3. Interpret a table and graph with descriptive statistics.
4. Identify whether a variable is nominal, ordinal, interval or ratio level of measurement.
5. Identify and match the descriptive statistic appropriate for the level of measurement.
6. Discuss the difference between parametric and non-parametric statistics.
7. Discuss measures of central tendency and dispersion.
8. Identify, calculate and graph descriptive statistics: measures of central tendency (mean, median mode), measures of dispersion- range, standard deviation, graphs (histogram, bar, column, pie), percentile ranking.

### **Chapter 8 Research Methods, Study Design, and Analytic Studies**

*By the end of the lesson, the student will be able to:*

1. Define the following epidemiological terms: variables (independent, dependent), type of study (descriptive, survey, ex post facto, experimental, field, longitudinal, panel, prospective, retrospective), stratification, matching, cohort, crosssectional, randomization, quasi).
2. Reviews observational epidemiology and research design used in epidemiology.
3. Discuss rationale for using certain research design in epidemiological studies.
4. Discuss at least two different research design approaches.
5. Discuss pertinent research control mechanisms used in epidemiology.
6. Analyze epidemiology case studies for research methods, study design, and analyses.

### **Chapter 9 Time, Place, and Person**

*By the end of the lesson, the student will be able to:*

1. Define the following epidemiological terms: time, place, person, temporal, dot map, Poisson distribution, time-place cluster.
2. Discuss the effect of time, place, and person on the study and control of disease in populations.
3. Identify and differentiate the four trends in time (secular, short-term, cyclic, and seasonal).
4. Identify and discuss the five criteria peculiar to place.
5. Discuss how maps are used in epidemiology.
6. Identify and discuss what personal characteristics (age, gender, race/ethnicity, marital/family status, occupation, level of education attained) are used in epidemiology to study and control disease in populations.
7. Graph time, place, and/or person epidemiological data.

### **Chapter 10 Observational Methodology, Association, and Causality Development**

*By the end of the lesson, the student will be able to:*

1. Define the following epidemiological terms: consistency, strength, specificity, time relationship, congruence, sensitivity, biological/medical, plausibility, experiments and research, analogy factors, predisposing, enabling, precipitating, reinforcing, hypothesis, surveillance, analytical epidemiology, risk, risk factors, screening test, true negative/positive, false negative/positive.
2. Identify and match the ten causality criteria of disease: (consistency, strength, specificity, time relationship, congruence, sensitivity, biological/medical, plausibility, experiments and research, analogy factors).

3. Discuss the twelve criteria for causation to consider in an epidemiological investigation.
4. Discuss the factors in causation of disease (predisposing, enabling, precipitating, reinforcing).
5. Discuss how hypotheses are derived and write a hypothesis.
6. Identify and discuss risk factors associated with particular diseases/disorders discussed in class-- (Examples: tuberculosis, violence, obesity, tobacco and alcohol abuse, sexually transmitted diseases, dental caries, child abuse, Hansen's disease, etc.).

### **Chapter 11 Developing and Conducting Investigations and Studies**

*By the end of the lesson, the student will be able to:*

1. Define the following epidemiological terms: epidemiological questions, epidemiological field study, control, feedback, foodborne illness/infection, goal, objective, prevention activities, occupational epidemiological study, propagated epidemic.
2. Discuss methods used in developing and conducting investigations and studies in epidemiology.

### **Chapter 12 Behavioral and Chronic Disease Epidemiology**

*By the end of the lesson, the student will be able to:*

1. Define the following epidemiological terms: case-control study, at-risk behavior, cause and effect diagram, health belief model, multiple exposures, levels of prevention (primary, secondary, tertiary), risk factor, web of causation.
2. Discuss methods used in chronic disease, behavioral and noncommunicable disease epidemiological analysis of populations at risk for outbreaks of disease, disability, and conditions.
3. Discuss role of chronic disease and behavioral and noncommunicable disease causation in groups and populations.
4. Present several approaches to control and prevention and health protection in chronic disease and behaviorally caused and noncommunicable diseases.
5. Diagram webs of causation for chronic diseases discussed in class.

### **Infectious Diseases and Social Epidemiology Topics and Epidemiology-Related Movies**

*By the end of each lesson, the student will be able to:*

1. Discuss the pathogenesis and epidemiology of health topics covered during the semester: dengue fever, small pox, West Nile virus, anthrax, Norwalk-like virus, plague, cholera, Hansen's disease, tuberculosis, flu, SARS, and other topical epidemiological issues of relevance to public health.
2. Identify epidemiological processes used in the movie(s) viewed, and discuss how those processes are consistent/inconsistent with current epidemiological investigative standards.
3. Identify and analyze current epidemics, public health preventive and control measures taken, and outcomes.
4. Attend, discuss, and analyze epidemiology-related presentations on campus (if assigned).
5. Identify, discuss, and analyze epidemiology-related current events presented in class.

Revised July 14, 2006