BIOLOGY 335  
PRINCIPLES OF EPIDEMIOLOGY  
Spring 2018- 3 Credits, CRN 34851  
Time: T/R, 2:00- 3:30pm  
Location: 107 Murie  
Prerequisites: STATS 200 or permission of instructor

Instructor Information  
Andrea Bersamin, Ph.D.  
Email: abersamin@alaska.edu  
Office: 228 AHRB  
Telephone: (907)474-6129

Office Hours  
By appointment. If you have questions about the class or would like to discuss your class performance, I encourage you to come and see me.

Course description  
Epidemiology is the study of the distribution and determinants of disease, or other health-related outcomes, in human and animal populations. *Fundamentals of Epidemiology* introduces the basic concepts of epidemiology, with examples from human and veterinary medicine, including chronic and infectious disease epidemiology, social epidemiology, outbreak investigation, properties of tests, and an introduction to study design and surveillance.

Course goals  
- Understand how epidemiology enables individuals in a wide variety of fields to assess the impact and relevance of health events.  
- Understand that the factors associated with the causes of health and disease can be determined through systematic and rigorous epidemiologic methods designed to analyze patterns in populations and formulate and test hypotheses.  
- Be able to critically consider health issues that appear in the popular media and apply basic epidemiologic concepts to problems that arise in daily living.  
- Be able to apply concepts learned in class to design a study

Learning objectives  
Upon completion of this course, you will be able to do the following:  
- Understand the contributions of epidemiology to clinical research, medicine and public health  
- Identify key sources of data for epidemiological purposes.  
- Explain the population perspective and describe public health problems  
- Apply and interpret measures of disease occurrence and correlates in populations  
- Explain the concept of risk  
- Use basic methods for investigating disease outbreaks  
- Explain relative strengths and limitations of different epidemiologic study designs  
- Identify and control major sources of error in epidemiological studies  
- Evaluate epidemiologic evidence by applying criteria for causal inference  
- Use epidemiologic methods to evaluate public health interventions  
- Appreciate complexities in applying scientific evidence in making policy
Instructional Methods

The course will include lectures, class discussions, case studies, text book and journal article readings, and assignments, including a semester-long research project. There are three types of sessions that you will be responsible for attending.

- **Lecture sessions** include traditional lectures where the class comes together to learn specific epidemiological concepts (e.g. measures of morbidity and mortality, sensitivity and specificity, and research design).
- **Consultation sessions** involve the individual student research teams meeting with the instructor to discuss various aspects of the proposal.
- **Workgroup sessions** are meetings among the research teams. These meetings will take place both inside and outside class.

Course Readings

**Required:**
- Additional readings will be assigned to supplement the main textbook or as part of various homework assignments; these will be made available on Blackboard.

**Optional** (if you are particularly interested in a topic and desire additional information, these are excellent texts that can be used to supplement the primary text and lectures):
- Giesecke J. *Modern Infectious Disease Epidemiology*.

**Some useful websites:**
- The Cochrane Library [http://www.cochrane.org/reviews/index.htm](http://www.cochrane.org/reviews/index.htm)
Demographic and health surveys (DHS) [http://www.measuredhs.com/](http://www.measuredhs.com/)
Alaska Health and Social Services Department of Epidemiology: [http://www.epi.hss.state.ak.us/](http://www.epi.hss.state.ak.us/)
Epidemiologic Research and Information Center newsletter [http://cphp.sph.unc.edu/trainingpackages/ERIC/issue2.htm](http://cphp.sph.unc.edu/trainingpackages/ERIC/issue2.htm)

**Student Evaluation**

<table>
<thead>
<tr>
<th>Points Possible</th>
<th>Points</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Exams</td>
<td>2 @150 points</td>
<td>34%</td>
</tr>
<tr>
<td>Peer review of significance section</td>
<td>40 points</td>
<td>4.5%</td>
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<tr>
<td>Final significance section</td>
<td>80 points</td>
<td>9%</td>
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<tr>
<td>Team presentation I</td>
<td>80</td>
<td>9%</td>
</tr>
<tr>
<td>CITI Human subjects training</td>
<td>50</td>
<td>5.5%</td>
</tr>
<tr>
<td>Approach section</td>
<td>150</td>
<td>17%</td>
</tr>
<tr>
<td>Team presentation II</td>
<td>100</td>
<td>11%</td>
</tr>
<tr>
<td>Assignments</td>
<td>81 points</td>
<td>9%</td>
</tr>
</tbody>
</table>

Total Points: 881

*Grades will be on a straight percentage basis.*
A= 94-100%; A-=90-93.9%
B+= 87-89.9%; B= 84-86.9% ;B-= 80-83.9%
C+= 77-79%; C= 74-76.9% ; C-= 70-73.9 %
D+= 67-69%; D = 64-66.9%; D-= 60-63.9%
F= 59% and below

**Instructor and course evaluation:**
Teaching is a learning process and it is impossible to facilitate learning without student feedback. I will be gathering feedback throughout the semester will allow me to address problems or difficulties while the course is on-going. Unsolicited constructive feedback is welcome anytime.

**Course Requirements**

**Readings:**
In-class discussions and activities will require that you have completed the required readings. The course reading list is included in the syllabus. Additional readings (e.g. newspaper articles, journal articles, policy briefs, etc.) will be assigned throughout the semester and will be provided as hand-outs or posted on Blackboard. *Student participation is important and this requires that all students come prepared having read the required readings in advance.*

**Exams:** There will be 3 in-class exams. Exams will include T/F, multiple-choice, matching, short answer and essay questions. Exams will be based on lectures, readings, and assignments. There
will be NO make-up exams. Under very unusual circumstances early exams will be offered with approval from the instructor; arrangements must be made well in advance.

**Assignments:** There will be 6 take-home assignments (variable point values). Assignments will be provided in class. Paper copies of your completed assignments are due at the **beginning** of the class indicated on the class schedule. No late assignments will be accepted. If you are not able to turn in an assignment due to extenuating circumstances (i.e. medical emergency for which you have a doctor’s note), please come and see me during my office hours or by appointment.

**Assignments:**
- Descriptive epidemiology of obesity (9 pts)
- Measures of disease frequency (15 pts)
- Age adjustment (15 pts)
- Study design (7 pts)
- Measures of association and risk (20 pts)
- Confounding and effect modification (15 pts)

**Research Proposal.** In teams of 3, you will select a health topic of interest to research over the course of the semester. Your research will culminate into a written research proposal that proposes an intervention to address the health topic.

**Epi in the news (extra credit):**
Throughout the course, you have the opportunity to earn up to ten extra credit points by bringing a newspaper or internet article related to epidemiology, summarizing its contents for the class, and providing a one paragraph written summary. Current events must have been published within the last six months. This exercise will assess your ability to critically review health-related stories published in the popular press. You will earn 5 points for each current event article and summary. Written and oral summaries should include at minimum:
- State the objectives of the study
- Summarize the study design and findings
- Provide a copy of original article (if available) to me (preferably as a PDF)
- Provide your opinion on how the “average” reader will respond to the article. Will the article influence decision making or thinking? Does the article leave out any important information?

**Course Policies**

**Communication:** Announcements and schedule changes will be made by e-mail or on Blackboard. It is your responsibility to check your e-mail or Blackboard at least twice weekly. I encourage you to contact me with any comments or questions. If you don’t understand something please ask.

**Attendance:** Daily attendance and participation are expected.

**Withdrawal:**
Jan. 26: Deadline for 100 percent refund of tuition and fees
Jan. 26: Deadline for student-initiated and faculty-initiated drops (course does not appear on academic record)
Mar. 30: Deadline for student-initiated and faculty-initiated withdrawals (W grade appears on academic transcript)

**Honor Code and Plagiarism:** You are expected to uphold the UAF standard of conduct for students relating to academic dishonesty. You assume full responsibility for the content and integrity of the academic work you submit. For the student code or additional information, please use the following URL http://www.uaf.edu/catalog/current/academics/regs3.html

**UAF Disability Services**
Disabilities Services: The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. I will work with the Office of Disabilities Services (208 WHIT, 474-5655) to provide reasonable accommodation to students with disabilities.  **If you require any assistance due to documented disability, please let me know by the 2nd week of classes and I will be happy to make whatever accommodations are necessary.**

<table>
<thead>
<tr>
<th>Date</th>
<th>Class Topic</th>
<th>Readings/ Assignments</th>
<th>Research Proposal</th>
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</thead>
<tbody>
<tr>
<td>Tu Jan 16</td>
<td>Foundations of Epidemiology</td>
<td>Read: Gordis, Chpt. 1</td>
<td>Introduction to research project</td>
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<tr>
<td>TH Jan 18</td>
<td>Foundations of Epidemiology</td>
<td>Read: Rose (1985)</td>
<td>Team formation and Workgroup session to identify population &amp; health problem of interest (20 min)</td>
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<tr>
<td>Tu Jan 23</td>
<td>Measuring the occurrence of disease: morbidity</td>
<td>Read: Gordis, Chapter 3</td>
<td>Explanation of significance section</td>
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<td>Due: Descriptive epi of obesity</td>
<td>Consultation Session (10 min/team)</td>
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<td>Workgroup session (50 min)</td>
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<tr>
<td>TR Jan 25</td>
<td>Measuring the occurrence of disease: mortality</td>
<td>Read: Gordis, Chapter 4</td>
<td>Select population &amp; health problem of interest</td>
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<td>Due: Measures of disease frequency</td>
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<tr>
<td>Tu Jan 30</td>
<td>Assessing the validity and reliability of tests</td>
<td>Read: Gordis, Chapter 5</td>
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<td>Due: Age adjustment</td>
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<td>Date</td>
<td>Topic</td>
<td>Read</td>
<td>Due</td>
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<tr>
<td>Th Feb 1</td>
<td>Assessing the validity and reliability of tests</td>
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<tr>
<td>Tu Feb 6</td>
<td>Study design: Experimental studies</td>
<td>Read: Gordis, Chapter 7</td>
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<tr>
<td>TR Feb 8</td>
<td>Study design: cohort and cross-sectional studies</td>
<td>Read: Gordis, Chapter 9</td>
<td>Draft for peer review</td>
</tr>
<tr>
<td>Tu Feb 13</td>
<td>Study design: case-control studies</td>
<td>Read: Gordis, Chapter 10</td>
<td>Discussion of specific aims</td>
</tr>
<tr>
<td>TR Feb 15</td>
<td>How to give and effective research presentations Exam Review</td>
<td>Due: Study design</td>
<td>Work group and Consultation session to discuss intervention ideas and specific aims (45 min)</td>
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<tr>
<td>Tu Feb 20</td>
<td><strong>EXAM 1</strong></td>
<td></td>
<td><strong>Due: 1c. Final significance section</strong></td>
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<tr>
<td>TR Feb 22</td>
<td>Estimating risk</td>
<td>Read: Gordis, Chapter 11, 12</td>
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<tr>
<td>Tu Feb 27</td>
<td>Team presentations</td>
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<td>Team presentations</td>
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<tr>
<td>TR Mar 1</td>
<td>Team presentations</td>
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<td>Team presentations</td>
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<tr>
<td>Tu Mar 6</td>
<td>Intervention Research Health promotion</td>
<td>Read: Theory at a glance Due: Measures of association and risk</td>
<td>Workgroup session to discuss preliminary intervention design (15 min)</td>
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<tr>
<td>TR Mar 8</td>
<td>Intervention Research Health promotion</td>
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<td>Work group session &amp; Consultation session to continue work on intervention design (45 min)</td>
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<tr>
<td>Tu Mar 13</td>
<td>Causal inference</td>
<td>Read: Gordis, Chapter 14</td>
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<tr>
<td>TR Mar 15</td>
<td>Causal inference</td>
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<tr>
<td>Tu Mar 20</td>
<td>Bias, confounding, and interaction</td>
<td>Read: Gordis, Chapter 15</td>
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<tr>
<td>TR Mar 22</td>
<td>Bias, confounding, and interaction</td>
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<tr>
<td>Tu Mar 27</td>
<td>Designing a research study</td>
<td>Due: Bias, confounding and interaction</td>
<td>Workgroup and Consultation session to discuss questions and progress on approach (50 min)</td>
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<tr>
<td>TR Mar 29</td>
<td>Social determinants of health Film: <em>Unnatural Causes</em></td>
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<tr>
<td>Date</td>
<td>Topic</td>
<td>Read</td>
<td>Due</td>
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| Tu Apr 3 | Social determinants of health                                          | Read: Ludwig (2011) *NEJM*  
Read: Krieger (2007) |              |
| TR Apr 5 | The dynamics of disease transmission  
Infectious vs chronic disease | Read: Gordis, Chapter 2 |              |
| Tu Apr 10 | Translating epidemiology into practice                                | Read: Gordis, Chapter 19 |              |
| TR Apr 12 | Review and wrap up                                                   |               | Due Apr 13 by 5p: 4  
Complete Human Subjects  
Research Training |
| Tu Apr 17 | EXAM 2                                                              |               |              |
| TR Apr 19 | Student presentations 2                                               | Due Apr 20: 5 Approach  
Section          |              |
| Tu Apr 24 | Student Presentations 2                                              |               |              |
| TR Apr 26 | Student Presentations 2                                              |               |              |