BIOLOGY 335
PRINCIPLES OF EPIDEMIOLOGY
Spring 2019- 3 Credits, CRN 33028
Time: T/R, 2:00- 3:30pm
Location: 107 Murie
In-person
Prerequisites: STATS 200 or permission of instructor

Instructor Information
Andrea Bersamin, Ph.D.
Email: abersemin@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.

Learning outcomes
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, textbook and journal article readings, and assignments.

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 Canvas.

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*.
• Smith RD. 2006. Veterinary Clinical Epidemiology: a problem-oriented approach. 3rd Ed. Taylor & Francis, Boca Raton, FL.

Some useful websites:
The Cochrane Library [http://www.cochrane.org/reviews/index.htm](http://www.cochrane.org/reviews/index.htm)
US Preventive Services Task Force (USPSTF) [http://www.ahrq.gov/clinic/uspstfix.htm](http://www.ahrq.gov/clinic/uspstfix.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**

*Points Possible:*

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
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<tbody>
<tr>
<td>Exams</td>
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<tr>
<td>Epi calculation assignments</td>
<td>99 points</td>
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<tr>
<td>Validity and reliability lesson</td>
<td>40 points</td>
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<tr>
<td>Review sheet and exam review: group assignment</td>
<td>35 points</td>
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<tr>
<td>Translating epidemiology into practice</td>
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<tr>
<td>Historical figures of epidemiology presentation</td>
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<tr>
<td>Journal article presentation and discussion facilitation: group assignment</td>
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**Total Points: 544**

*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 2 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, unless there are extenuating circumstances. Under very unusual
circumstances early exams will be offered with approval from the instructor; arrangements must be made well in advance.

**Calculation Assignments**: There will be 7 take-home assignments (variable point values) that for the most part require calculations using formulas learned in class. Assignments are posted on Canvas. Completed assignments should be uploaded onto Canvas by 2p on the due date. Assignments:

- Descriptive epidemiology of obesity (9 pts)
- Measures of disease frequency (15 pts)
- Sensitivity and Specificity (18 pts)
- Age adjustment (15 pts)
- Study design (7 pts)
- Measures of association and risk (20 pts)
- Confounding and effect modification (15 pts)

**Presentations and Written Assignments**. There are 5 presentations and/or writing assignments, 3 of which will be completed in pairs or groups:

- Presentation on a historical figure in epidemiology
- Paper and presentation that describes the effective translation of epidemiology into public health practice
- Journal article presentation and class discussion facilitation (in pairs)
- Creation of a review sheet and in-class review activity (in groups)
- Validity and reliability lesson (in groups)

**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:

- Post a copy of the original article on google drive in the folder titled: **Epi in the news**
- State the objectives of the study
- Summarize the study design and findings in lay terms
- 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 Canvas. It is your responsibility to check your e-mail and Canvas regularly. I encourage you to contact me with any comments or questions. If you don’t understand something please ask. I will do my best to reply to e-mails within 24 hours.
Late assignments: Late assignments will not be accepted unless prior arrangements have been made with me at least 1 week before the assignment due date or there is an extenuating circumstance.

Attendance: Daily attendance and participation are expected.

Withdrawal:
Jan. 25: Deadline for student-initiated and faculty-initiated drops with refund (course does not appear on academic record)
Mar. 29: Last day for student- 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

Student Protections and Services Statement
Every qualified student is welcome in my classroom. As needed, I am happy to work with you, disability services, veterans' services, rural student services, etc to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX), and minors have additional protections. As required, if I notice or am informed of certain types of misconduct, then I am required to report it to the appropriate authorities. For more information on your rights as a student and the resources available to you to resolve problems, please go the following site: www.uaf.edu/handbook/

Effective Communication
Students who have difficulties with oral presentations and/or writing are strongly encouraged to get help from the UAF Department of Communication’s Speaking Center (907-474-5470, speak@uaf.edu) and the UAF English’s Department’s Writing Center (907-474-5314, Gruening 8th floor), and/or CTC’s Learning Center (604 Barnette st, 907-455-2860).
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<tr>
<th>Day</th>
<th>Date</th>
<th>Topic</th>
<th>Readings</th>
<th>Student Article</th>
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<tr>
<td>T</td>
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<td>1. Foundations, history and applications of Epidemiology</td>
<td>Chapter 1 P.30-34 Rose article</td>
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<td>2. Disease surveillance and measures of morbidity</td>
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<td>T</td>
<td>1/22/18</td>
<td>3. Mortality and other measures of disease impact</td>
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<td>4. Assessing validity and reliability</td>
<td>Chapter 5 √</td>
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<td>Tour of virology lab</td>
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<td>1/31/18</td>
<td>5. RCT studies</td>
<td>Chapters 7 &amp; 8 √</td>
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<td>6. Cohort studies</td>
<td>Chapter 9 √</td>
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<td>7. Case control and other studies</td>
<td>Chapter 10 √</td>
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<td>9. From association to causation</td>
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<td>10. Bias, confounding and interaction</td>
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<td>11. Social determinants of health</td>
<td>Krieger &amp; Ludwig article</td>
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<td>12. Field epidemiology</td>
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<td>13. Epidemiology and public policy</td>
<td>Chapter 19</td>
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<td>14. Ethical and professional issues in Epi</td>
<td>Chapter 20</td>
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<td>15. Health promotion and Intervention Research</td>
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<td>Design an intervention activity</td>
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May 2: Exam