Submit original with signatures + 1 copy + electronic copy to UAF Governance.
See http://www.uaf.edu/uafgov/faculty/cd for a complete description of the rules governing curriculum & course changes.

**TRIAL COURSE OR NEW COURSE PROPOSAL**

**SUBMITTED BY:**

<table>
<thead>
<tr>
<th>Department</th>
<th>Biology</th>
<th>College/School</th>
<th>CNSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepared by</td>
<td>Andrea Bersamin</td>
<td>Phone</td>
<td>474-6129</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:abersamin@alaska.edu">abersamin@alaska.edu</a></td>
<td>Faculty</td>
<td>Andrea Bersamin</td>
</tr>
<tr>
<td>Contact</td>
<td></td>
<td>Contact</td>
<td></td>
</tr>
</tbody>
</table>

1. **ACTION DESIRED**
   (CHECK ONE):
   - Trial Course [X]
   - New Course [ ]

2. **COURSE IDENTIFICATION:**
   - Dept: BIOL
   - Course #: 394
   - No. of Credits: 3

   **Justify upper/lower division status & number of credits:**
   This course has STATS 200 (or higher) or permission of instructor as a prerequisite. 3 hours of instruction will be provided per week. Students need the general sophistication of upper-division status before taking on this integrative course.

3. **PROPOSED COURSE TITLE:**
   Fundamentals of Epidemiology

4. **To be CROSS LISTED?**
   - YES/NO
   **If yes, Dept:**
   **Course #**

   (Requires approval of both departments and deans involved. Add lines at end of form for such signatures.)

5. **To be STACKED?**
   - YES/NO
   **If yes, Dept:**
   **Course #**

6. **FREQUENCY OF OFFERING:**
   - Every Spring
   - Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Demand Warrants

7. **SEMESTER & YEAR OF FIRST OFFERING (if approved)**
   Spring 2011

8. **COURSE FORMAT:**
   NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council. Furthermore, any core course compressed to less than six weeks must be approved by the core review committee.

   **COURSE FORMAT:**
   (check all that apply)
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5
   - [X] 6 weeks to full semester

   **OTHER FORMAT (specify)**
   Mode of delivery (specify lecture, field trips, labs, etc)

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**Received SEP – 9 2010**

Dean's Office
College of Natural Science & Mathematics
9. CONTACT HOURS PER WEEK:  

LECTURE hours/weeks:  
LAB hours/week:  
PRACTICUM hours/week:  

Note: # of credits are based on contact hours. 800 minutes of lecture = 1 credit. 2400 minutes of lab in a science course = 1 credit. 1600 minutes in non-science lab = 1 credit. 2400–4800 minutes of practicum = 1 credit. 2400–8000 minutes of internship = 1 credit. This must match with the syllabus. See http://www.uaf.edu/uafgov/faculty/cd/credits.html for more information on number of credits.

OTHER HOURS (specify type) N/A

10. COMPLETE CATALOG DESCRIPTION including dept., number, title and credits (50 words or less, if possible):

BIOL 394, Fundamentals of Epidemiology, 3 credits. Introduction to 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.

11. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found on Page 10 & 17 of the manual. If justification is needed, attach on separate sheet.)

H = Humanities  
S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core?  
YES  NO  X

IF YES, check which core requirements it could be used to fulfill:

O = Oral intensive, Format 6
W = Writing intensive, Format 7
Natural Science, Format 8

12. COURSE REPEATABILITY:

Is this course repeatable for credit?  
YES  NO  X

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

N/A

How many times may the course be repeated for credit? TIMES

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course? CREDITS

13. GRADING SYSTEM: Specify only one.

LETTER: X  
PASS/FAIL: 

14. RESTRICTIONS ON ENROLLMENT (if any)

STAT 200X  
STAT 200X or higher or permission of instructor

These will be required before the student is allowed to enroll in the course.

RECOMMENDED

Classes, etc. that student is strongly encouraged to complete prior to this course.

15. SPECIAL RESTRICTIONS, CONDITIONS N/A

16. PROPOSED COURSE FEES $0
17. PREVIOUS HISTORY
Has the course been offered as special topics or trial course previously?
   Yes/No
   NO

   If yes, give semester, year, course #, etc.: N/A

18. ESTIMATED IMPACT
WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.
Classroom space will be needed. This course will be part of the instructor’s regular workload.

19. LIBRARY COLLECTIONS
Have you contacted the library collection development officer (kijensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

   No   Yes  X

   8/30. Karen Jensen directed me to the following resources which are adequate for the class: online and print Epidemiology journals, Epidemiology books that are available both in the library and via the Electronic Book Library.

20. IMPACTS ON PROGRAMS/DEPTS
What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

Biology and Wildlife will house the course.

21. POSITIVE AND NEGATIVE IMPACTS
Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.

This course introduces the basic concepts of epidemiology, using examples from human and veterinary medicine. The course will likely complement a number of existing programs within the Biology and Wildlife department including biomedical sciences and wildlife biology. No negative impacts are anticipated. This course will be part of the instructor’s regular workload.
The purpose of the Department and Campus-wide Curriculum Committees is to scrutinize course change and new course applications to make sure that the quality of UPR education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.
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What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

Biology and Wildlife will house the course.

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This course introduces the basic concepts of epidemiology, using examples from human and veterinary medicine. The course will likely complement a number of existing programs within the Biology and Wildlife department including biomedical sciences and wildlife biology. No negative impacts are anticipated. This course will be part of the instructor's regular workload.

JUSTIFICATION FOR ACTION REQUESTED
The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.

This course will contribute to UAF's growing biomedical program as well as serve students with an interest in veterinary and wildlife disease processes. The course will cover topics that are shared by human and veterinary medicine including: measures of morbidity and mortality, properties of tests, study design, outbreak investigations, surveillance, causal inference and chronic and infectious disease epidemiology. More broadly, the class should also improve students' scientific literacy.

I surveyed members of the premed society asking about their interest in the class and have received enthusiastic support. I would like to offer the course at the 300 level and understand that the Biology and Wildlife Department has a need for courses at this level.

APPROVALS:

Signature, Chair, Program/Department of: Biology & Wildlife
Date Sept 1, 2010

Signature, Chair, College/School Curriculum Council for:
Date 9/9/2010

Signature, Dean, College/School of:
Date 9/9/2010

Signature of Provost (if applicable)

Offerings above the level of approved programs must be approved in advance by the Provost.
APPROVALS:

Signature, Chair,
Program/Department of:  

Date

Signature, Chair, College/School Curriculum Council for:

Date 9/9/10

Signature, Dean, College/School of:

Date

Signature of Provost (if applicable)
Offerings above the level of approved programs must be approved in advance by the Provost.

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

Signature, Chair, UAF Faculty Senate Curriculum Review Committee

Date

ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stacking)

Signature, Chair,
Program/Department of:

Date

Signature, Chair, College/School Curriculum Council for:

Date

Signature, Dean, College/School of:

Date
BIOLOGY 394
FUNDAMENTALS OF EPIDEMIOLOGY
Spring 2011- 3 Credits
Time: TBD
Location: TBD
Prerequisites: STATS 200 or permission of instructor

Instructor Information
Andrea Bersamin, Ph.D. is an assistant professor in the Biology Department and the Center for Alaska Native Health Research
Email: aberzamin@alaska.edu
Office Hours: by appointment
Office: 234 AHRB
Telephone: (907)474-6129

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
To provide students with an overview of the fundamentals of epidemiology.

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, textbook and journal article readings, and assignments. Every week there will be two hours of lecture and one hour dedicated to discussion, case-studies, or in-class assignments. Student participation is important and this requires that all students come prepared having read the required readings in advance.

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*.
The Cochrane Library http://www.cochrane.org/reviews/index.htm
US Preventive Services Task Force (USPSTF) http://www.ahrq.gov/clinic/uspsftfix.htm
Demographic and health surveys (DHS) http://www.measuredhs.com/
Health Systems Database: http://healthsystems2020.healthsystemsdatabase.org
Alaska Health and Social Services Department of Epidemiology: http://www.epi.hss.state.ak.us/

Student Evaluation

<table>
<thead>
<tr>
<th>Points Possible:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
</tr>
<tr>
<td>Assignments</td>
</tr>
<tr>
<td>Class discussions</td>
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</tbody>
</table>

Total Possible Points: 450

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

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.

Exams: There will be 2 midterm exams and 1 comprehensive final exam. 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 10 assignments over the course of the semester. Detailed instructions will be provided in class.

Extra Credit: Extra-credit opportunities will be available throughout the course. They will be presented in class, unannounced.

Withdrawal:
Jan. 28: Deadline for 100 percent refund of tuition and fees
Feb. 4: Deadline for student-initiated and faculty-initiated drops (course does not appear on academic record)
Feb. 4: Deadline for 50 percent refund of tuition (tuition only, no fees refunded)
Mar. 25: 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.

Detailed schedule of topics, concepts, key terms, readings, and assignments

Concepts and key terms are provided for each week of the course, and these should be used to ensure that you’ve understood the reading materials and lectures.

Introduction to Epidemiology
January 20

Concepts and key terms:
- Definitions of epidemiology and its contribution to other disciplines
- Key historical events in epidemiology
- Key features and uses of descriptive epidemiology
- Key features and uses of analytic epidemiology
- Applications of epidemiology in public health practice
- Primary, secondary and tertiary prevention
- Exposure and outcome

Readings:
Gordis, Chapter 1

Studying Populations
January 25

Concepts and key terms:
- Population vs. an individual perspective
- Epidemiological transition
- Heterogeneity of populations
- Dynamic population factors: birth rate, fertility and mortality rates
- High risk populations

Readings:
Terris. 1979. The Epidemiologic Tradition
Rose. 1985. Sick individuals and sick populations

Dynamics of Disease Transmission
January 27

Concepts and key terms:
- Stages of disease
- Epidemiologic triad
- Modes of transmission of communicable disease in a population
- Endemic, epidemic and pandemic
- Herd immunity
- Attack rate
- Acute outbreak investigation

Readings:
Gordis, Chapter 2

Measuring Disease: Morbidity
February 1

Concepts and key terms:
- Calculate and interpret the following measures of morbidity:
  - ratios
  - proportions
  - incidence rates, including attack rate
  - prevalence
- Relationship between incidence and prevalence
- Surveillance in public health

Readings:
Gordis, Chapter 3

Measuring Disease: Mortality
February 3

Concepts and key terms:
- Calculate and interpret the following measures of morbidity:
  - Mortality rate
  - Case-fatality rate
  - Proportionate mortality
• Direct and indirect age adjustment
• Years of potential life lost
• Cohort effect

Readings:
Gordis, Chapter 4

Disease Detection and Population Screening: validity and reliability
February 8 and 10

Concepts and key terms:
• True positive, false positive, true negative and false negative test results
• Consequences of false positive and false negative test results
• Sensitivity, specificity, positive and negative predictive value
• Effect of prevalence on predictive value
• Validity and reliability

Readings:
Gordis, Chapter 5

EXAM 1
****  February 15  ****

Intervention Studies
February 17 and 22

Concepts and key terms:
• Double-blind randomized controlled trial
• Placebo or control group
• Purpose of randomization and blinding
• Generalizability
• Non-compliance
• Strengths and limitations of trials
• Ethical considerations of conducting trials
• Three major US randomized trials

Readings:
CONSORT guidelines
Gordis, Chapters 7 and 8

Cohort, Cross-sectional, and Ecological Studies
February 24 and March 1

Concepts and key terms:
• Cohort study design, strengths and limitations
• Cross-sectional study design, strengths and limitations
• Ecological study design, strengths and limitations
• Ecological fallacy
• Prospective and retrospective studies

Readings:
Gordis, Chapter 9 and 10

Case-Control Studies
March 3

Concepts and key terms:
• Case-control study design, strengths and limitations
• Selection of cases and controls
• Matching
• Recall bias

Readings:
Gordis, Chapter 10 and 13

Estimating Risk
March 8 and 10

Concepts and key terms:
• Relationship between exposures and outcomes
• Odds ratio and a relative risk
• Absolute risk
• Attributable risk

Readings:
Gordis, Chapter 11 and 12

Spring Break
March 15 and 17

Causal Inference
March 22

Concepts and key terms:
• Association vs. causation
• Criteria for causality, Koch’s postulates
• Real or spurious association
• Necessary and sufficient

Readings:

Fundamentals of Epidemiology, Biology 394: tentative syllabus (subject to change)

Bersamin Spring 2011
Gordis, Chapter 14

Bias, Confounding and Interaction
March 24 and 29

Concepts and key terms:
- Bias, confounding and error
- Interaction
- P-value

Readings:
Gordis, Chapter 15

Exam II
March 31

Role of Genetic and Environmental Factors
April 5 and 7

Concepts and key terms:
- Diseases with known genetic origin
- Use of genetic markers
- Family studies, twin studies, adoption studies, migrant studies
- Gene X environment interactions

Readings:
Gordis, Chapter 16

Translating Epidemiological Evidence in Practice
April 12 and 14

Concepts and key terms:
- Efficacy, effectiveness, and efficiency
- Steps involved in health planning
- examples of disease prevention and health promotion strategies
- Examples of interventions to address the social determinants of health
- Vertical and horizontal approaches for improving health
- Methodological issues in epidemiology: volunteer bias, lead time bias, overdiagnosis bias
- Cost benefit analysis

Readings:
Gordis, Chapter 17 and 18

**Social Determinants of Health**
**April 21 and 26**

**Concepts and key terms:**
- Social epidemiology and social determinants of health
- Discrimination
- Biological expressions of social inequality
- Ecosocial theory of disease distribution
- Social justice

**Readings:**

**Film:**
Unnatural Causes: In Sickness and in Wealth

**Epidemiology and Public Policy**
**April 28**

**Concepts and key terms:**
- Population vs. high-risk approach to prevention
- Epidemiology and clinical medicine
- Risk assessment
- Publication bias
- Sources and impact of uncertainty

**Readings:**
Gordis, Chapter 19

**Ethical and professional issues in Epidemiology**
**May 3**

**Concepts and key terms:**
- Privacy and confidentiality
- Geneva convention and Belmont report
- Race and ethnicity in epidemiological studies
- Conflict of interest

Fundamentals of Epidemiology, Biology 394: tentative syllabus (subject to change)

Bersamin Spring 2011