I. GOALS AND DESCRIPTION OF THE WRITTEN PAPER:

Each student in the epidemiology and epidemiology/biostatistics master’s program is required to submit a written paper by a given deadline early in the spring semester that precedes graduation and to present/defend that paper. The defense of the paper in the spring semester in the presence of two or more faculty is designed to meet the requirement of the Graduate Division and the School of Public Health for an oral examination. More details about the final due date for paper submission and dates and process for the defense will be provided later.

All students must receive a passing grade on their paper/oral examination in order to receive the MPH degree.

Students can elect to write one of the four types of papers:

1) A critical review of an epidemiologic topic
2) A formal meta-analysis of an epidemiologic topic
3) An article describing the results of original epidemiologic research conducted by the student
4) A detailed proposal for an original epidemiologic research project

Regardless of the type of paper written, there are three features that should be common to all the papers submitted to fulfill this requirement:

1) The paper must be original work done by the student
2) The paper must treat an epidemiologic topic and demonstrate knowledge of/competence in basic concepts related to epidemiologic research (e.g. study design and analysis, bias, confounding, effect modification, etc.)
3) The paper must make clear the relevance of the topic to health/public health

II. DETAILS CONCERNING THE DIFFERENT TYPES OF PAPERS:

A) Critical Reviews

Students will prepare a critical review of an epidemiologic subject area that is relevant to public health.

The review should be a concise, critical review of the existing body of knowledge. The critique should focus on issues of study design and the validity of the inferences that are drawn from the studies. The emphasis should be on a synthesis and interpretation of the data and not simply a recitation of facts. The paper should explicitly discuss the relevance of the subject to current or recommended public health practice/guidelines and research. The critique should focus less on statistical issues and should concentrate on the basic concepts of epidemiologic design and analysis as they relate to research or health practice evaluation. Discussion of health policy should be a secondary consideration, and any such discussion should follow logically from the discussion of the epidemiologic issues or health practice evaluation.
Before you select a topic, be sure that there is an established body of published work. A useful guideline would be the ability to find at least 10-15 references on the topic in peer-reviewed journals. Although most topics that relate to epidemiology will be suitable, many students often choose to examine the epidemiologic evidence supporting the causal relationship between a given exposure and an outcome (e.g., passive cigarette smoke and lung cancer). Papers that address what are primarily clinical or laboratory issues are not acceptable nor are papers that review the “epidemiology” (i.e., the descriptive epidemiologic features) of a given disease or condition. In general, the evaluation of factors that affect the delivery of an intervention is also not a suitable topic, although it is acceptable to assess the effect of an intervention or control program on measurable health outcomes (e.g., disease incidence, morbidity, mortality, etc.) in a population.

The review should explicitly address the following points:

1. The importance of the topic in the context of public health.

2. Current research (what is the current state of knowledge about the subject)
   a. Strengths and limitations of existing data in relationship to the subject in general and for public health in particular.
   b. Implications of the existing data for current public health practice/guidelines and future research.

3. New directions (what additional knowledge needs to be developed)
   a. Discuss epidemiological design and analysis issues that are relevant to your suggestions for new and/or additional studies.
   b. Public health implications: Justify additional studies in terms of public health practice/outcomes and/or improved understanding of the problem.

The discussion of “new directions” should not be a simple recitation of basic theoretical epidemiological concepts. The discussion should demonstrate your understanding of the application of the relevant concepts to the specific subject that is addressed by the paper. Recommendations for specific research designs and/or analyses should follow from your critique of the existing body of knowledge. In other words, you should justify your choice of research designs based upon your review. It is not sufficient, for example, simply to restate that a prospective study would be better than a particular set of case-control studies; because, in theory, prospective studies have a number of advantages over case-control studies where causal inference is the goal. Examples of excellent review articles from previous years are on reserve in the Public Health library.

**B) Meta-analysis**

Students will prepare a meta-analysis of the available evidence on an epidemiologic subject area that is relevant to public health in order to combine the results of previous studies and to arrive at summary conclusions about a body of research on a topic.
The meta-analysis should specifically address the following points:

1) The importance of the topic in the context of public health.

2) The approaches used to identify all literature relevant to the topic, which includes articles and abstracts identified from the bibliographies of other articles; articles and abstracts published in foreign languages; articles and abstracts published prior to electronic MEDLINE cataloging; and articles and abstracts from professional meetings.

3) The precise criteria (and how these criteria were defined) used to include in or exclude from the formal meta-analysis the specific articles identified in #2 above. When properly detailed, these criteria would lead an independent investigator to include the identical body of literature.

4) How quality scoring of the articles was conducted.

5) The approach used to abstract data from the previously published work, which includes details of steps taken to blind the student and/or his collaborators to the author and journal of each abstracted article. Appendices to the student meta-analysis should include the data abstraction instruments designed for the study as well as a description of how they were developed.

6) The statistical procedures used to combine the data and the specific approaches used for an estimation of the magnitude of the effect.

7) Detailed explanation of the tests of homogeneity applied to the data and their limitations.

8) Exploration of the variability in the results either qualitatively or through meta-regression.

9) Detailed explanation of the approaches to sensitivity analysis of the meta-analysis results (such approaches may include, but are not limited to, stratification by: study design, quality (of article) score, year of publication, size of study population or re-analysis with serial exclusion of included studies).

10) Discussion of the possible limitations of the meta-analysis, with identification of evidence for or against publication bias.

11) Identification of the questions still in need of study after the completion of the meta-analysis and the most reasonable approach (i.e. specific study design) to address these questions.
12) Identification of the journal to which the meta-analysis will (hopefully) be submitted. Students should format their meta-analysis using the style sheet for this specific journal and should turn in with their meta-analysis a copy of the journal’s most recently published “Instructions to Authors”. (If there are discrepancies between the Instructions to Authors for the journal chosen by the student and the general instructions for this MPH project, such discrepancies should be discussed with the students’ advisor well in advance of the deadline).

C) Results of Original Research
Students who have conducted original epidemiological research can submit a paper that describes the results of that work. The work must be primarily that of the student (i.e. the student should warrant being the first author on a publication that describes the results) and cannot already be published or in press. The epidemiologic research that is described in the paper should have at least some analytic components, even if the work being described is primarily descriptive in nature. Details that relate to the format for such a paper are given below. **Students interested in choosing this option should be advised that it has a number of potential pitfalls. A convincing case must be made in advance that the plan for producing such a paper of high quality and in the time frame available is well conceived.**

D) Proposals for Original Epidemiologic Research Projects
Students can submit a proposal for an original epidemiologic research project. The proposal must be the original work of the student not that of a faculty member for whom the student works/has worked. Furthermore, the proposal must be newly developed specifically for this assignment — it cannot be a proposal the student has prepared for one of the courses here at the school that requires the development of a research proposal. The proposal must be for an epidemiologic study that has analytic components, rather than for a study that is entirely descriptive in nature. Details that relate to the format for such a paper are given below. **Again, students considering this option should be advised that it is difficult to write a high quality proposal for an original epidemiologic research project.**

III. PREPARATION AND FORMAT OF THE PAPER:
A) A General Format
Regardless of the type of paper written, the text is to be no longer than 20 pages with double line spacing. This page limit does not include tables, graphs, or references. Page margins must be 1” top, right, and left.
12 point type of any type is acceptable. Do not use smaller type unless it is an approved NIH grant format (e.g., Arial 11).
Do not use footnotes either on individual pages or as a list at the end of the text. Provide a cover sheet with a title, your name, and the name of the faculty advisor assigned to you for the paper.

B) Tables and Graphs
Tables and graphs should always be placed at the end of the text after the reference list--
they should not be interspersed with the text. Tables and graphs should be labeled in a manner that permits them to be interpreted without reference to the text. The combined number of tables and graphs should not exceed eight.

C) Bibliography

While there is no formal limit on the number of references you can cite, it is rarely necessary for the number of references to exceed fifty. The reference format must conform to that used by the American Journal of Epidemiology. Consult the “Instructions to the authors” provided by the journal in each of the monthly issues for the appropriate format.

D) Additional Specific Details for Different Types of Papers

1) Critical Reviews

Tables and graphs should be used to maximum advantage to summarize the features, results, and peculiarities/limitations of the studies being reviewed. The text should not simply reiterate the facts contained in the tables and graphs but should represent a critical discussion or synthesis of the material summarized in the tables and graphs. The bibliography should reflect your judgment as to the most relevant material. You do not need to discuss in the text every reference that you cite. The tables can be used to summarize material that is not discussed directly in the text, but the tables cannot be used to provide material that is not directly relevant to the text.

2) Meta-analysis

Tables, figures (such as flowcharts), and graphs should be used to present the results of the article identification process, a summary of the articles included (as a group) compared to the articles/abstracts excluded (as a group), the effect estimates and confidence bounds of the individual articles/abstracts and the summary effect estimates under the various models employed (such as random effects or fixed effects). Tables can and should be used to present relevant material not covered directly in the text.

3) Results of Original Research

A standard format for published articles reporting the results of original epidemiologic research should be used. This format includes the following sections labeled as such:

a) Abstract
b) Background/Context
c) Methods
d) Results (text)
e) Discussion/Interpretation
f) References
g) Tables/graphs

4) Proposals

A proposal for an epidemiologic research project should follow the NIH grant application
format and should include the following components:
   a) Aims
   b) Background and significance
   c) Research design and methods, including how key variables will be defined and measured and the general approach to analysis of the data. This section should include discussion of control for possible confounders and assessment of effect modification, when appropriate, as well as a justification of the proposed sample size.
   d) Discussion of the strengths and weaknesses of the proposed study
   e) Realistic time line
   f) Discussion of any relevant ethical human subject concerns
   g) References

Neither a budget nor a section concerning personnel/resources is required.

IV. FACULTY ADVISING:

In the Fall Semester before the paper is due, each student will be assigned to a faculty member with expertise in the subject matter of the students’ proposed paper. This individual may or may not be the student’s regular academic advisor. Students can suggest an appropriate adviser (see list below). The student will work with and receive ongoing input from that faculty member during the various stages of planning and writing of the paper. (See deadlines section below.)

It is the student’s responsibility to seek out/make appointments with the assigned advisor and to submit various stages of the work to him/her in a timely fashion. It is the faculty member’s responsibility to be available to the students and to provide substantive feedback to the student in a timely fashion. However, it is generally not reasonable to expect substantive feedback within a day or two.

It is expected that you will have at least two appointments with your master’s paper advisor to discuss the paper as it develops.

Any student who experiences difficulty making appointments with or receiving timely and substantive feedback from the assigned faculty advisor should immediately bring this problem to the attention of the Program Head, Art Reingold (email: reingold@berkeley.edu).

V. SCHEDULE OF DEADLINES 2014-15:

A. October 3: Students submit topic area and type of paper planned as described below by email by 5:00PM. Students in both the one-year and two-year programs must submit their paper to: jcarolm@berkeley.edu.

In the email please include:
1. The specific research question you wish to address.
2. Whether this is a project on which you have been working or whether this is a new area/subject for you.
3. The name of an advisor, if you have arranged for a specific advisor already some research questions will not fit into the PICO format; in that case, please
write a concise statement of the hypothesis being evaluated or the research question being investigated.

4. Your program (1 year MPH or 2 year MPH, or MS)
5. project type:
   a. Traditional narrative review
   b. Systematic review (and/or meta-analysis)
   c. Grant proposal
   d. Primary data analysis

B. Oct 10: Students and faculty receive a list of their respective advisor/advising assignments.
C. Oct 20: Students submit directly to their assigned advisors a written description of the specific topic and paper type. This submission (up to 1 page in length) should include a statement of issues to be addressed.
D. Nov 3: Students submit, directly to their advisors, a 3-4 page summary with refinement of issues to be addressed, general plan for the paper, and a 5-10 reference annotated bibliography. The annotation should be a short paragraph that indicates why that reference is relevant to the topic.
E. Dec. 5: Students submit, to their advisors, a first draft (at least 10-15 pages) with annotated bibliography of 15-20 references.
F. January 23, 2015: Deadline for faculty advisor to return first draft with detailed comments.

Additional meetings between students and their faculty advisors can be arranged at the discretion of the student or the faculty member. A minimum of two meetings with advisors is strongly recommended, as is liberal use of email.

Copies of masters papers submitted in recent years are on file in the Epidemiology Journal Library, along with an alphabetical index by year. Eventually, an electronic library of past papers will be available.

THE MASTERS PRESENTATION

Students will present their masters papers in one of two sections of the spring seminar (PH 292) to be scheduled.

Here are some of the guidelines for the presentation:

1. You will have 10 minutes to present the key points of your paper to two faculty members. An electronic copy of your paper will be forwarded to them by Janene Martinez a few days beforehand. A Power Point projector will be available. You may also address or
correct any issues that you have thought about since submitting your paper. Be sure that your presentation does not exceed the time limit.

2. After 10 minutes the faculty will ask questions, and when they’re done an open discussion will ensue.

3. You may invite any other faculty or students to attend.

4. You will be notified immediately after the session whether you have passed.

If you do not pass, you will be asked to rewrite your paper and possibly to present it orally again. The last opportunity to do so will be scheduled in mid-April. If you do not pass your comprehensive exam by then, you will not graduate and you will have to sign up for summer session and find two faculty members who are available during the summer to hear you talk or else register for classes the following fall semester and take it then. Either way, you will receive your degree in December instead of May.
Prospective Masters Paper Advisers for Epidemiology and Epi/Biostat Students

Abrams, Barbara, DrPH, RD, Professor, Epidemiology
Ahern, Jennifer, PhD, MPH, Asst. Professor, Epidemiology
Aragon, Tomas, MD, DrPH, Asst. Adj Professor, Epidemiology
Balmes, John, MD, PhD, Professor in Residence, EHS
Barcellos, Lisa, PhD, Assoc Professor, Epidemiology
Bates, Michael, PhD, Adj Professor, Epidemiology
Bauer, Heidi, MD, MS, MPH, Asst Adj Professor, Epidemiology
Bernstein, Kyle, PhD, Asst Adj Professor, Epidemiology
Carmichael, Suzan, PhD, Asst Adj Professor, Epidemiology
Catalano, Ray, PhD, MRP, Professor, CHHD
Chokkalingam, Anand, PhD, Asst Adj Professor, Epidemiology
Colford, Jack, MD, PhD, MPH, Professor, Epidemiology
Dudoit, Sandrine, PhD, Professor, Biostatistics
Eisen, Ellen, ScD, Adj Professor, EHS
Ekstrand, Maria, PhD, Assoc Adj Professor, Epidemiology
Eskenazi, Brenda, PhD, MA, Professor, Epidemiology
Fernald, Lia, PhD, MBA, Assoc Prof, Nutrition
Hubbard, Alan, PhD, Assoc Professor, Biostatistics
Jagust, William, MD, Professor, HSB
Jewell, Nicholas, PhD, Professor, Biostatistics
Kaskutas, Lee, DrPH, Assoc Adj Professor, HSB
Metayer, Catherine, MD, PhD, Asst Adj Professor, Epidemiology
Minnis, Alexandra, PhD, MPH, Asst Adj Professor, Epidemiology
Mujahid, Mahasin, PhD, MSc, Asst Professor, Epidemiology
Nuru-Jeter, Amani, PhD, MPH, Asst Professor, CHHD
Ozer, Emily, PhD, Assoc Professor, HSB
Padian, Nancy, PhD, MPH, Adj Professor, Epidemiology
Petersen, Maya, MD, PhD, Asst Professor, Biostatistics
Reingold, Arthur, MD, Professor, Epidemiology
Riley, Lee, MD, Professor, Epidemiology
Satariano, William, PhD, MPH, Professor, Epidemiology
Selvin, Steve, PhD, Professor, Biostatistics
Smith, Allan, MD, PhD, Professor, Epidemiology
Steinmaus, Craig, MD, PhD, MPH, Asst Adj Professor, Epidemiology
Syme, S. Leonard, PhD, Professor Emeritus, Epidemiology
Van der Laan, Mark, PhD, Professor, Biostatistics