Epidemiology Department

Capstone Project Handbook

for

General Epidemiology and

International Health

60 and 42 Credit Hour Students

Fall 2007
**Introduction and Overview of your Internship and capstone project**

Field Experience and applied course work. One of the requirements for getting your MPH in Epidemiology at Michigan is completing the Capstone project. It represents the “hands on” portion of the curriculum in your degree. There are five courses that directly support the Capstone project. The skills you gain from the Capstone include: job searching, Human Subjects Protection administration, study design and data collection, data analysis, presentation of your findings, and writing a thesis paper.

### Applied course work and field experiences supporting the Capstone project

<table>
<thead>
<tr>
<th>Course</th>
<th>Term</th>
<th>Credit</th>
<th>Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPID 657 Field Studies in Epidemiology I</td>
<td>First Winter</td>
<td>1 credit</td>
<td>S/U</td>
</tr>
<tr>
<td>EPID 655 Field Studies in Epidemiology</td>
<td>First Winter</td>
<td>2 credits</td>
<td>Graded</td>
</tr>
<tr>
<td>EPID 656 Data analysis in epidemiology</td>
<td>Second Fall</td>
<td>3 credits</td>
<td>Graded</td>
</tr>
<tr>
<td>EPID 658 Field Studies in Epidemiology II</td>
<td>Second Fall</td>
<td>1 credit/</td>
<td>Graded</td>
</tr>
<tr>
<td>EPID 659 Writing of master's thesis paper in Epidemiology</td>
<td>Second Fall and Winter or Second Winter</td>
<td>2 credits in 2 terms or 4 credits</td>
<td>Graded</td>
</tr>
</tbody>
</table>

EPID 657 requirements: Finding and getting ready for your internship.

The requirements for 657 include:

- Attend one or more meetings on finding internships. Attend one or more meeting about preparing IRB applications. You will be notified of the meeting times. Attendance will be taken at these meetings. If a student completes an internship but doesn’t attend at least one of these meetings, that student will not get credit for 657.

- Begin the process for getting IRB approval or exemption for the work you will be doing on your internship. The application is available online at [www.irb.research.umich.edu/](http://www.irb.research.umich.edu/).

- Hand in all required internship paperwork to the EPID Student Services Office by the last week of classes in the Winter term.

EPID 655 requirements: Developing knowledge and skills for your internship

This course provides applied, hands-on training in basic questionnaire design, data management and simple data analysis. You will also get more training in data analysis in BIOSTAT 510 and 523 which run concurrently with EPID 655.

EPID 658 requirements: Presenting your internship results

For EPID 658, you must submit an abstract, present a poster about your internship at the
Annual Poster Session in the fall and complete an evaluation form about your internship.

The poster presentation includes:
- Preparing an abstract
- Preparing and displaying a poster at the Poster Session
- Preparing to give a two minute overview of your work to a panel of judges and answering questions from judges and students.

You will be provided with instructions for preparing your presentation as well as examples of previous abstracts and posters. For students with limited funds, the EPID Department offers money for poster printing.

**Learning to analyze your data and to write up your results**

**EPID 656 requirements**

This course is taught in the second Fall term. The purpose of the course is to provide hands-on training in data analysis using data obtained from your internship or other existing databases.

**EPID 659 requirements:**

This course gives you credit for your work on your master’s thesis in the second year. You may register for 2 credits in the Fall and 2 in the Winter or 4 in the Winter. You register for EPID 659 under a specific faculty member, who serves as the advisor and grader for your thesis paper. As part of your work, you must discuss and agree upon a work plan with your thesis advisor. If you sign up for 2 credits in 2 terms, you will receive a ‘Y’ grade for your work in the first term. You must also complete an evaluation form at the end of the term.

**IRB.**

All internships must be evaluated for the need for IRB approval. The chart on the next page will assist you in making that determination. You should also consult with your 657 advisor and the internship supervisor at the site where you will be working.
<table>
<thead>
<tr>
<th>Circumstance</th>
<th>UM IRB Review Required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A practicum/internship that falls within the work scope of a local, state, or federal agency (e.g. Public Health Agency) or employment by private industry involving data collection for non-research purposes. No a priori research design or intent.</td>
<td>NO</td>
</tr>
<tr>
<td>Use of or access to human subjects data previously collected for non-research purposes (perhaps through a circumstance like the one above) in a systematic investigation designed to contribute to generalizable knowledge, one indicator of which is publication.</td>
<td></td>
</tr>
<tr>
<td>Participation with or providing services to a local PI conducting IRB-approved research. No work outside the scope of the IRB approval.</td>
<td>NO</td>
</tr>
<tr>
<td>Independent research project not falling within the scope of a previously approved project.</td>
<td></td>
</tr>
<tr>
<td>Participation with or providing services to a non-UM researcher. Research is approved by a non-UM IRB. Student is providing research assistance at a level not normally requiring an IRB project amendment. Requires letter from non-UM PI attesting to non-UM IRB approval, and providing assurances that the non-UM IRB does not require an amendment in accord with its own SOPs. Letter maintained by the student's UM faculty mentor.</td>
<td>NO</td>
</tr>
<tr>
<td>Student is providing research assistance at the level of key personnel. No different from standard collaborative research situation.</td>
<td></td>
</tr>
<tr>
<td>As part of its review, the local IRB receives assurances that the project has been approved by a non-UM IRB at the non-UM location.</td>
<td></td>
</tr>
<tr>
<td>Official memorandum to make the non-UM IRB the IRB-of-Record for the student’s participation. Standard form signed in OVPR. Kept in OVPR.</td>
<td>NO</td>
</tr>
</tbody>
</table>
INTERNSHIP REQUIREMENTS

Description of Fieldwork Position:

1. Your fieldwork ideally should include opportunities to participate in the planning and conduct of an epidemiologic study and to communicate your ideas and findings to others. If you have little previous experience in data collection, you should try to select a project where that experience is offered.

2. Your fieldwork student should be supervised by an epidemiologist or other population scientist. If you find a desirable internship where this is not offered, consult your faculty advisor or your 657 supervisor.

3. An EPID faculty member must approve the fieldwork experience and agree to act as your faculty supervisor for the summer fieldwork experience (EPID 657 advisor). This person does not have to be your regular faculty advisor. It can be the person with whom you would work on your 659 project, but this is not required.

4. You must receive IRB approval from the University of Michigan’s IRB, prior to beginning any work at the internship.

5. The fieldwork must last at least the equivalent of 8 weeks of full-time employment. You will be granted a credit reduction to be applied to your overall credit requirement for obtaining the MPH degree. For every 106 hours worked on the internship, 1 credit is taken off of the credit requirement for the degree up to 4 credits. You should consider the advantages of a longer, more complete experience than 8 weeks.

6. You are strongly encouraged to schedule your fieldwork experience for the summer between your first and second year of study.

FINDING AN INTERNSHIP

7. You are responsible for arranging your own internship. Most students are able to obtain a paid work experience but this is not always the case. Much depends on your personal resources, individual circumstances and the extent to which you look for opportunities. There are a number of resources that are available to you to help find fieldwork experience:

   a. Faculty members may be consulted as a resource to help the student locate a position.

   b. The SPH Career Services Office (in room 3537 SPH I, Office of Student Affairs) keeps a listing of positions available and archival data from previous internships that can help the student develop prospects for an internship.

   c. Networking with health department officials in an area where you would like to work is encouraged.

   d. The EPID Department maintains a list of past internships that you can review.
Agreement for Fieldwork: University of Michigan, Epidemiology Program

The Department must ensure the fieldwork placement meets our standards. We require that the student, fieldwork supervisor and sponsoring faculty member sign this agreement. The student must provide this signed agreement to the Departmental Student Services Office before the student leaves for the fieldwork placement. At the end of the placement, the regular faculty advisor is responsible for ensuring that requirements have been met and for approving the appropriate credit reduction. Please call Student Services with any questions (734 764 5415)

Name of organization: _____________________________________________________
Location of internship: Address/City/State/Country:
_______________________________________________________________________

Expected Internship dates: _____________   to   ______________________ (dates)

Supervisor Name: _____________________________________________________
Telephone: _____________________________ (please include country codes if needed)

INTERNSHIP SUPERVISOR: This fieldwork placement is planned to meet EPID department requirements and I will ensure that the work carried out is consistent with them. I am committed to serve as this student’s on site supervisor for the duration of the internship. I agree to fill out an evaluation of the student’s performance at the completion of the internship.

Signature ____________________________________________________________ Date_______________

STUDENT NAME: _____________________________________(print or type) I have ascertained that this fieldwork placement is planned to be consistent with the requirements described in the Capstone Handbook and I will try to ensure that the actual work carried out is consistent with that description. I agree to fill out an evaluation of my internship at the completion of the experience.

Signature ____________________________________________________________ Date_________

Contact telephone: __________________

EPID FACULTY: NAME: ____________________________. I have ascertained that this fieldwork placement is planned to be consistent with the above-described characteristics. I have agreed to serve as faculty supervisor for this student.

Signature: ___________________________ Date:_____________ Telephone:____________________
AFTER YOUR INTERNSHIP

After your internship, you will take three more steps to complete your Capstone requirements:

1. Presenting your internship results and evaluating your internship (EPID 658)
2. Writing your EPID 659 thesis paper.

PRESENTING YOUR RESULTS: POSTER SESSION

You must write and submit an abstract in advance of the poster session. The abstract should briefly and clearly describe some aspect of your internship to be presented at the poster session. Be concise; save details for the poster and discussion. Bear in mind that the audience will include incoming graduate students and researchers from other disciplines who may not be familiar with the topic areas of your internship. First-year MPH students will also be visiting your poster to ask you questions about your internship.

The abstract should include:

(1) Objectives: Overview of the importance of the problem (background and significance or introduction)

(2) Methods (design, population, analysis approach)

(3) Results or implications

(4) Conclusions from proposed or ongoing research.

(5) Location of the internship, Supervisor(s), How the internship was identified.

Examples: On the AJPH website [www.ajph.org](http://www.ajph.org/) you will find all the abstracts from AJPH for the past year. In addition to the above four headings you also need to include:

Faculty and Student Services will create an abstract booklet for distribution to session attendees and for use by students in the future. Specific instructions about the time/date and procedures for submitting your poster will be provided each year by the EPID student services office. Examples of posters from past sessions and other resources for poster development will be provided.

(see [http://www.swarthmore.edu/NatSci/cpurrin1/posteradvice.htm](http://www.swarthmore.edu/NatSci/cpurrin1/posteradvice.htm))

Adobe illustrator can be used for creating a poster ([http://www.dc.umich.edu/posterprinting/creating.html](http://www.dc.umich.edu/posterprinting/creating.html)) as well as Powerpoint and other software.

STUDENT POSTER PRIZE

Two $100 prizes will be given for the best student posters. Posters will be judged by a panel of faculty and advanced doctoral students in the department. Judging your poster will take place during the time you are assigned to be by your poster. You should prepare to give an oral a two-minute presentation highlighting the main points for your poster. Be prepared to answer questions about your internship. The panel will use the following criteria to judge the posters:
1. Clarity of presentation: effectiveness of written text, graphs and tables (50%)
2. Explanation of internship project to colleagues and judges (40%)
3. Poster appearance: neatness, attractiveness (10%)

The winner will be announced shortly after the poster session.

**MASTER’S PROJECT: EPID 659**

Each student must arrange for supervision and advice on their 659 project with a faculty member who has appropriate interest or expertise in the chosen area. The project is meant to provide you with one to one relationship between you and the faculty member. For this reason, faculty will limit the number of master’s students they advise in any year. You must also have a second reader who you can choose by agreement with your 659 advisor.

Your project may be in any topic area agreeable to you and the faculty member who will supervise your 659 work. For students without interest in or access to a specific data set, the faculty member can make available an existing data set or assist you to find one. Data you collected during the internship are acceptable to use even though the data may be only preliminary or incomplete. There are a series of milestones that are meant to guide you in developing your project and in completing it in a timely manner (before graduation). Completion of EPID 659 after your scheduled graduation in April of the second year is **strongly** discouraged. Your MPH is not awarded until you have completed this project.

1. The Faculty is limited in the number of students they can advise. Thus, it is in the student's interest to make arrangements early if there is somebody specific you want to work with.

2. Faculty will meet with students at least twice during the preparation of each milestone.

3. Grading: The faculty member will give you a final letter grade for the completed paper.

**Selecting your 659 advisor**

1. Your 659 advisor must be a member of the UM Epidemiology faculty. This can include faculty with a joint or adjunct appointment. Other faculty from other departments may serve as co-advisors under special circumstances. Approval for outside co-advisors must be obtained by a student's petition to the Curriculum Committee.

2. Students may select the Epidemiology faculty member who serves as the 659 supervisor. This can be your 657 supervisor, your academic advisor or other eligible faculty member who is qualified, interested and willing. The second reader is only expected to read your final draft and comment on it.

3. Upon successful completion of the Epidemiology 659 project, the students are responsible for providing the Department Student Services office with copies of their 659 papers in hard and electronic form.

**659 Format and Milestones**

The paper must include the following sections:
There are three intermediate milestones and one final milestone to be completed and handed in by the student. The timing is reached by agreement with the advisor but all steps must be completed before graduation.

**Milestone 1: Background and statement of research problem**

- **Background**: what scientific research has revealed about a problem and why the issue is important. A brief, critical summary of methods and their limitations used by other investigators and their relationship to the proposed work should be included. Quality in the choice of citations rather than quantity of citations is to be encouraged. Fifteen to thirty citations would be appropriate.

- **Hypotheses/questions**: A clear statement of the research problem and the hypotheses(es) to be tested should be presented at the conclusion of this section.

**Milestone 2: Methods**

- Description of population, sampling procedures, methods of data collection, measurement of key variables and construction of derived variables.

- Conceptual models for the analysis. Include what confounding relationships might exist for a relationship of primary interest and what joint effects of variables are to be investigated. Evaluation of effect modification (if planned) should be addressed.

- Statistical methods to be used in the analysis. This should include parameter estimation procedures, discussion of how the procedures control for confounding and/or address effect modification and how the appropriateness of the statistical models for the data will be assessed. *Multivariate analysis must be a part of the 659 project*. Analysis plans should include some of the multivariate procedures taught in Biostat 523 or 560 such as multiple linear and logistic regression, survival analysis, etc.

It is especially important that the student demonstrate the ability to discuss topics using terminology generally intelligible to other qualified public health scientists. To facilitate completion of analyses, the advisor and student should discuss ‘dummy’ tables or graphs that will be presented in the Results section.

**Milestone 3: Results**

The final product should include a limited number of tables and graphs (no more than 8) combined with an appropriate written discussion of the results presented. The results
section should include both tables or figures and a narrative explaining the results.

**Final Milestone: the final paper**

The final paper draft must include a discussion section. In the discussion section, the findings should be compared to other studies and consider the implications for future research. The strengths and limitations of the work should be more carefully described than is usual in an article submitted for publication. Issues of validity, precision and generalizability to other populations should be enumerated and the impact of the particular study design used on these issues should be discussed. A brief description of improvements that could be made in the study design should be a part of this.

It is highly recommended that the final paper include no more than 7 tables and graphs, be limited to 3000 words not including tables, graphs, references, title page or abstract.

**Criteria for Evaluating 659 Final Papers**

**Background:**
- Do I understand the importance of the problem the author is trying to address? Has the specific problem been described? What is the rationale for this study?
- Methods: Do I know how the study population was selected, the methods used for gathering data and measuring variables, and the techniques used for analyzing the data?
- Results: Is the analysis presented in sufficient detail to support the major results? Were all relevant analyses included and discussed? Were the results correctly described and interpreted?
- Limitations and implications: Do I know the characteristics of the study population, which will influence the generalizability of the findings? Can I judge to what type of populations these results may apply?

**Discussion:**
- Has the author considered how problems in the design, conduct, and analysis of the study could affect inferences from the study?
- Do I understand why the major findings are important; how they fit with the current state of knowledge in epidemiology and public health?
- Do I have an idea as to what the next study might be or how the results in the current study might be practically applied?
- Does the paper present a coherent discussion of why the project was done, on whom, where the project fits in current state of knowledge, and what should be done next?
- With appropriate revision, do you think this paper might be accepted for publication in a peer-review journal? If not, why not?