

Body of the Internship Paper and Research Report Guidelines

Environmental and Occupational Health

A practicing career in environmental and occupational health will encompass routine tasks and research approaches to identify problems and their resolution. The EOH capstone experience includes a 3 credit hour community or workplace based internship (CPH 909) and a separate 3 credit hour hypothesis based and data driven research project with public health application (CPH 900). Some students select different sites for these two components of the capstone experience. If two different sites are selected, then two separate reports are required as outlined in Section A (Internship report) and Section B (Research Report) described below.

Other students may spend more time at one site and write a single integrated report as outlined in Section C. Whether written as one report or two, the reports must follow the general University of Arizona standard thesis/dissertation format as described in <https://arizona.app.box.com/v/grad-gsas-thesisformat> with sample pages provided at: <http://grad.arizona.edu/gsas/dissertations-theses/sample-pages>.

The University format refers to the substance of the report under a single heading called “Body.” The following sections describe what the EHS faculty expect to find in the “Body” portion of the report and some suggestions about where to demonstrate competency in each of the core MPH disciplines.

Section A: Guidelines for the body of the internship report.

The internship manual outlines the content of the report. Faculty may require more or less for any given report depending on the specifics of the project. Regardless of the project, the body of each internship report must address all sections described below and competencies attained in the core course areas must be demonstrated. Review the MPH program and section competencies related to each core area and describe how the project contributed to competency development.

1. Sections 1-6 of the internship outline (see manual) need to precede the following elements comprising

Section 7- the “Body” of the internship report, as described below.

A. Introduction and Background (5 pages)

- a. Broadly describe the issue addressed by the internship. Summarize the literature on the internship topic and how the broad goal relates to what is known. (Note: the literature review evaluates the primary literature in the field applicable to the topic. Do not rely solely on websites.)
 - i. State any hypotheses (null or alternative) (This may reflect the student’s knowledge of epidemiology &/or biostatistics. Again, demonstrate the specific competencies attained.)
- b. Describe the overarching objectives of the internship in the context of the field. (The literature review may include policy statements, legal limits or adopted guidelines proposed by various entities).
- c. Describe the specific goals, proposed outcomes, learning objectives, and activities of the internship.

B. Describe the sponsoring site where the work was conducted. (4 pages)

- a. Include the mission statement, organizational structure, funding sources and employee motivation and reward system. (This section reflects an understanding of policy and management knowledge. Describe specific competencies attained.)
- C. Methods (3-5 pages)—This section needs to be sufficiently detailed to enable replication or documentation of the project. Describe the methodology employed: specifically describe any actions taken (including calculations) to achieve the internship, evaluate the results or analyze the data. Describe the following as applicable to the internship:
 - a. Any special approvals needed and place copies in an appendix (College IRB determination submission and response; IRB approval, animal subjects approval, Radiation Control Approval, Certificates of special training attained to accomplish tasks etc.).
 - b. The study design employed, whether an environmental or workplace assessment or a population based project. Describe any recruitment or technique evaluating impacts on public health (i.e., focus groups, all employees, community recruitment etc., sample collection strategy whether environmental or workplace related). (Describe population demographics or characterize site specific features).
 - c. All data collection methods including questionnaires, methods of administration, validation, data entry, quality assurance measures. (Epidemiology & EOH competency).
 - d. The measurement methodology for physical environmental samples, including collection, analysis equipment, specific method, and measurement limits for environmental samples (for instance, method of chemical analysis, LOD, MDL, MLD, etc.) (EOH)
 - e. Any software used to obtain, enter, manipulate or analyze data. In educational program development or outreach efforts this may include other types of software and work products.
 - f. All equations used to calculate values; identify all terms so others can use the equation and replicate the calculations. In the RESULTS section report and explain tables, graphs and statistics associated with these calculated values. In the DISCUSSION section compare and contrast the measured values with regulatory values and measures reported in the literature.
 - g. Statistical tests used, the power and the significance level.
 - h. Describe how the necessary tasks were implemented and coordinated.
- D. Results or Output (<7 pages)—these may vary depending on the objective/task. In broad strokes describe what was produced or evaluated. Place actual products in appendices of the internship report. Examples:
 - a. Produced a slide show for training—Result = summary of people trained at the sponsoring site. Appendix = copy of the PowerPoint slide show. Refer to the appendix in the narrative.
 - b. Wrote a preparedness report for a county—Result = description could be process of development with a table of agencies and individuals consulted. Appendix = the written preparedness plan. Refer to the appendix in the narrative.
 - c. Performed safety survey of Hazardous materials. Results = a table showing the computerized data base structure developed for tracking/quantifying material. Appendix = the summary output from the database. Refer to the appendix in the narrative.
 - d. Developed a website for an agency—Result = process for identifying components and assessing needs; a report of the structure of the site at various levels. Appendix = screen shots of the developed. Refer to the appendix in the narrative.
 - e. Tables and graphs of measurements (raw and calculated) are results. These need to have accompanying interpretive text that describes the trend, statistic or feature. Do not regurgitate the contents of the table or graph in the text; instead —interpret|| the meaning of the data presented while citing important statistical results. Even appendices

need to be referred to in the narrative. Do not include tables and graphs that are not discussed in the narrative.

- E. Discussion (5 pages)—Evaluate what the results or output mean and describe the public health impact. As applicable to your internship:
 - a. Discuss the strengths and weaknesses of the data collected or the material developed.
 - b. Discuss whether any environmental or occupational limits have been exceeded or the effectiveness of the material or process developed. Determine whether a compliance standard has been violated. (Epidemiology & EOH)
 - c. Recommend necessary improvements: consider the economics and ethics of the proposed action or non- action. (EOH & Policy)
 - d. Relate the internship findings to the knowledge base of the field as presented in the introduction (see above). How do any results or products advance science and develop competency.
 - e. Discuss problems encountered, if any, and solutions proposed or utilized
- F. Summary and Conclusions/Recommendations (1-2 pages)
 - a. Provide a brief summary of the internship activity and achievements with an overall evaluation of the experience in terms of competencies developed.
 - b. Draw a conclusion from the work and based on the conclusion(s) make recommendations to the site that will protect the public health or meet the specified agency goal.

2. Finally, the student should go back to the MPH internship manual and be sure to include Section 8 (references), and Section 9 (appendices) as outlined.

Section B. Guidelines for Body of the Research Paper for Environmental and Occupational Health.

The research report follows the same thesis format as used for the Internship Report (above). The content differs in that it is written more tightly and mimics a publishable paper. It will not be necessary to describe the site in great detail or the specific competencies gained. The program goal is for the student to formulate a testable hypothesis, gather and analyze appropriate data, report and discuss results and draw conclusions with recommendations. The competencies addressed involve the ability to do research and write a concise report in a publishable format.

1. Sections 1-6 of the research report (see [thesis formatting manual](#)) need to precede the following elements comprising Section 7 -- the “Body” of the research report as described below.

Note: there are slight differences in the statement by author and signature pages (use thesis format for the Research paper & consult faculty).

- A. Introduction and Background (3-5 pages)
 - a. Broadly describe the issue addressed by the research project. Provide a comprehensive summary of the literature on the topic and how the broad goal relates to what is known. (Note: the literature review evaluates the PRIMARY literature in the field applicable to the topic. Use few (if any) websites.)
 - b. State any hypotheses (null or alternative)
 - c. Alternatively, the research paper might explore a controversial question with both pro and con publications. Some students choose to review and evaluate the literature addressing the topic and conclude the state of the science, or formulate a test of the

issue based on literature review. This approach is frequently more difficult than the direct performance of an experiment. It requires judgments of validity based on the written presentation.

- B. Methods (3 pages)—This section needs to be sufficiently detailed to enable replication or documentation of the project. Describe the methodology employed: specifically describe any actions taken (including calculations) to achieve the internship, evaluate the results or analyze the data. Describe the following as applicable to the internship:
- Any special approvals needed and place copies in an appendix (College IRB determination submission and response; IRB approval, animal subjects approval, Radiation Control Approval, Certificates of special training attained to accomplish tasks etc.).
 - The study design employed, whether an environmental or workplace assessment or a population based project. Describe any recruitment or technique evaluating impacts on public health (i.e., focus groups, all employees, community recruitment etc., sample collection strategy whether environmental or workplace related). (Describe population demographics or characterize site specific features).
 - All data collection methods including questionnaires, methods of administration, validation, data entry, quality assurance measures.
 - The measurement methodology for physical environmental samples, including collection, analysis equipment, specific method, and measurement limits for environmental samples (for instance, method of chemical analysis, LOD, MDL, MLD, etc.)
 - Any software used to obtain, enter, manipulate or analyze data. In educational program development or outreach efforts this may include other types of software and work products.
 - All equations used to calculate values; identify all terms so others can use the equation and replicate the calculations. In the RESULTS section report and explain tables, graphs and statistics associated with these calculated values. In the DISCUSSION section compare and contrast measured values with regulatory values and measures reported in the literature.
 - Statistical tests used, the power and the significance level.
 - Describe how the necessary tasks were implemented and coordinated.
- C. Results (<10 pages)—these may vary depending on the hypothesis tested.
- Tables and graphs of measurements (raw and calculated) are results. These need to have accompanying interpretive text that describes the trend, statistic or feature.
 - Make sure to describe the characteristics of the population examined if appropriate.
 - Summarize the data in tables and figures that illustrate relationships among variables.
 - Generally a 20 page paper has no more than 5 tables/figures combined.
 - Tables and figures should each be on a separate page
 - Text space should be roughly equivalent to that of the tables and figures.
 - Do not regurgitate the contents of the table or graph in the text; instead —interpret the meaning of the data presented while citing important statistical results.
 - If supplemental data are provided in an appendix, make sure to refer to the appendix in the text.
 - Do not include tables and graphs that are not discussed in the narrative.
- D. Discussion (3-5 pages....should be longer than the introduction).
- Evaluate what the results mean in the context of other publications, regulations or advisories
 - Discuss the health implications of the research at an individual and public level

- c. Describe the strengths and weaknesses of the work
- d. Identify any regulatory implications of the work in the context of the broader literature.

E. Conclusions

- a. Summarize the important findings
- b. Recommend necessary policy or regulatory changes
- c. Consider the economics and ethics of the proposed action or non- action.

F. Acknowledgements

- a. Subject participation
- b. Financial aid on the project
- c. Equipment loans
- d. Expertise provided

2. Finally, the student should go back to the thesis formatting guide and be sure to include Section 8 (references), and Section 9 (appendices).

Section C. Guidelines for the Body of a Combined Internship and Research Report for Environmental and Occupational Health.

Start by reading Section A and B above. Note the differences and realize that a combined report needs to bridge the depth found in each of the report separately. The combined report will have the same thesis format as used for the Internship Report (above).

1. Sections 1- 6 of the combined report outline (see internship manual) need to precede the following elements comprising Section 7--the “Body” of the internship report as described below.

A. Introduction and Background (~8 pages)

- a. Broadly describe the issue addressed by the internship and research. Provide a comprehensive literature review on the topic both in broad public health terms and specific information related to the research element of the project. (Note: the literature review evaluates the primary literature in the field applicable to the topic. Do not rely on websites.)
 - i. State the research hypotheses (null or alternative) (This may reflect the student’s knowledge of epidemiology &/or biostatistics. Again, demonstrate the specific competencies attained.)
- b. Describe the overarching objectives of the internship in the context of the field. (The literature review may include policy statements, legal limits or adopted guidelines proposed by various entities).
- c. Describe the specific goals, proposed outcomes, learning objectives, and activities of the internship.

B. Describe the sponsoring site where the work was conducted. (4 pages)

- a. Include the mission statement, organizational structure, funding sources and employee motivation and reward system. (This section reflects an understanding of policy and management knowledge. Describe specific competencies attained.)

C. Methods (~5 pages)—This section needs to be sufficiently detailed to enable replication or documentation of the project. Describe the methodology employed: specifically describe any

actions taken (including calculations) to achieve the internship, evaluate the results or analyze the data. Describe the following as applicable to the internship:

- a. Any special approvals needed and place copies in an appendix (College IRB determination submission and response; IRB approval, animal subjects approval, Radiation Control Approval, Certificates of special training attained to accomplish tasks etc.).
- b. The study design employed, whether an environmental or workplace assessment or a population based project. Describe any recruitment or technique evaluating impacts on public health (i.e., focus groups, all employees, community recruitment etc., sample collection strategy whether environmental or workplace related). (Describe population demographics or characterize site specific features).
- c. All data collection methods including questionnaires, methods of administration, validation, data entry, quality assurance measures. (Epidemiology, SBS, & EOH competency).
- d. The measurement methodology for physical environmental samples, including collection, analysis equipment, specific method, and measurement limits for environmental samples (for instance, method of chemical analysis, LOD, MDL, MLD, etc.) (EOH)
- e. Any software used to obtain, enter, manipulate or analyze data. In educational program development or outreach efforts this may include other types of software and work products.
- f. All equations used to calculate values; identify all terms so others can use the equation and replicate the calculations. In the RESULTS section report and explain tables, graphs and statistics associated with these calculated values. In the DISCUSSION section compare and contrast your values with regulatory values and measures reported in the literature.
- g. Statistical tests used, the power and the significance level. (Biostatistics)
- h. Describe how the necessary tasks were implemented and coordinated.

D. Results or Output (< 7 pages)

- a. Internship Activities—these may vary depending on the objective/task. In broad strokes describe what was produced or evaluated. Place actual products in appendices of the internship report. (Biostatistics & EOH). Examples:
 - i. Produced a slide show for training—Result = summary of people trained at the sponsoring site. Appendix = copy of the PowerPoint slide show. Refer to the appendix in the narrative.
 - ii. Wrote a preparedness report for a county—Result = description could be process of development with a table of agencies and individuals consulted. Appendix = the written preparedness plan. Refer to the appendix in the narrative.
 - iii. Performed safety survey of Hazardous materials. Results = a table showing the computerized data base structure developed for tracking/quantifying material. Appendix = the summary output from the database. Refer to the appendix in the narrative.
 - iv. Developed a website for an agency—Result = process for identifying components and assessing needs; a report of the structure of the site at various levels. Appendix = screen shots of the developed. Refer to the appendix in the narrative.
 - v. Tables and graphs of measurements (raw and calculated) are results. These need to have accompanying interpretive text that describes the trend, statistic or feature. Do not regurgitate the contents of the table or graph in the text; instead—interpret the meaning of the data presented while citing important statistical results. Even appendices need to be referred to in the narrative. Do not include tables and graphs that are not discussed in the narrative.

- b. Research Project Results (<10 pages) —these may vary depending on the hypothesis tested.
 - i. Tables and graphs of measurements (raw and calculated) are results. These need to have accompanying interpretive text that describes the trend, statistic or feature.
 - 1. Make sure to describe the characteristics of the population examined if appropriate.
 - 2. Summarize the data in tables and figures that illustrate relationships among variables.
 - 3. Generally a 20 page paper has no more than 5 tables/figures combined.
 - a. Tables and figures should each be on a separate page
 - b. Text space should be roughly equivalent to that of the tables and figures.
 - ii. Do not regurgitate the contents of the table or graph in the text; instead —interpret the meaning of the data presented while citing important statistical results.
 - iii. If supplemental data are provided in an appendix, make sure to refer to the appendix in the text.
 - iv. Do not include tables and graphs that are not discussed in the narrative.

E. Discussion (15 pages)

- a. Discussion of Internship Activities and Experience (5 pages)—Evaluate the summary of activities and their impact on local or population health. As applicable to your internship:
 - i. Discuss the strengths and weaknesses of the internship activities or the material developed.
 - ii. Discuss the site’s commitment to compliance. (Epidemiology & EOH)
 - iii. Recommend necessary improvements: consider the economics and ethics of the proposed action or non- action. (EOH & Policy)
 - iv. Relate the internship findings to the knowledge base of the field as presented in the introduction (see above). How do any results or products advance science and develop competency.
 - v. Discuss problems encountered during the internship, if any, and solutions proposed or utilized,
 - vi. Address the issues described earlier in the manual for all students under discussion (SBS). Specifically those outlined under “Internship Report content” on page 17.
- b. Discussion of Research Project (<10 pages)—Evaluate what the results or output mean and describe the public health impact. As applicable to your internship:
 - vii. Discuss the strengths and weaknesses of the data collected or the material developed.
 - viii. Discuss whether any environmental or occupational limits have been exceeded or the effectiveness of the material or process developed. Determine whether a compliance standard has been violated. (Epidemiology & EOH)
 - ix. Recommend necessary improvements: consider the economics and ethics of the proposed action or non- action. (EOH & Policy)
 - x. Relate the internship findings to the knowledge base of the field as presented in the introduction (see above). How do any results or products advance science and develop competency.
 - xi. Discuss problems encountered in the research, if any, and solutions proposed or utilized

F. Summary and Conclusions/Recommendations (2-4 pages)

- a. Provide a brief summary of the internship activity and achievements with an overall evaluation of the experience in terms of competencies developed.
- b. Draw a conclusion from the research work and based on the conclusion(s) make recommendations to the site that will protect the public health or meet the specified agency goal.

2. Finally, the student should go back to the MPH internship manual and be sure to include Section 8 (references), and Section 9 (appendices).