

# **Practicum and Culminating Project guide for the MPH with Specialization in Biomedical Informatics**

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**THE OHIO STATE  
UNIVERSITY**

COLLEGE OF MEDICINE



**THE OHIO STATE  
UNIVERSITY**

COLLEGE OF PUBLIC HEALTH

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# **PRACTICUM AND CULMINATING PROJECT FOR THE MASTER OF PUBLIC HEALTH IN BIOMEDICAL INFORMATICS**

## **Overview**

The objective of the practicum and culminating project in the Master of Public Health with a specialization in Biomedical Informatics (MPH-BMI) is to provide the student with a continuum of experiences that constitute the foundation for a career in applied biomedical informatics with a specific focus on addressing population-level health. These experiences range from the initial identification of motivating information needs, to the generation of informatics-based intervention strategies targeting such requirements, to the evaluation of the impact and outcomes of ensuing technologies and methods. Accordingly, the practicum and culminating project encompass different stages of the spectrum of experiences but are, in fact, a continuum in the process of new knowledge discovery and application.

## **The Practicum**

### **Practicum Content and Requirements**

For the MPH-BMI, the practicum represents an opportunity for the student to work closely with a research and/or operational mentor who serves as the preceptor to guide the student through a series of experiences. The student's academic advisor collaborates in designing and approving the learning content to ensure the content is biomedical informatics focused in nature.

Because of the multi-disciplinary nature of the BMI program, practicum projects can vary widely from student to student, depending on their respective interest in the field. Given this diversity, it is expected that students establish a base knowledge of BMI principles and theories by taking Introduction to Biomedical Informatics (BMI 5710), Introduction to Research Informatics (BMI 5740) and the biostatistics sequence (PUBHBIO 6210 & 6211) before starting their practicum projects. By establishing this foundation, the student will be able to identify appropriate projects and use informatics applications in all aspects of their topic selection, study design, planning, and project implementation. Finally, given the unique computational dimensions of the intersection between Public Health and Biomedical Informatics, a foundational acculturation to computer science is strongly encouraged prior to engaging in this practicum. Students should be active participants in the arrangements for a practicum, working closely with their advisor, other BMI and CPH faculty, and staff in BMI and CPH-OAPSS to learn of important college deadlines and required paperwork.

As its name implies, the practicum comprises the practical skills involved in any biomedical informatics research project. In addition, the student should have the opportunity to consider the research and its accompanying issues in a larger public health context. The typical MPH-BMI practicum should include the following elements:

1. Participation in the generation of an informatics-focused research project, working in collaboration with the research and/or operational mentor;

2. Design of a study (often as part of a broader project), including recognition of the classification of the study design and evaluation needs;
3. Appropriate consideration of the ethics of the study design including participation in the submission of the protocol to the Internal Review Board (IRB) as appropriate;
4. Appropriate planning for study design implementation including performance of pilot studies;
5. Design of data management instruments in support of the study evaluation plan, including the selection and codification of ensuing data sets, and the incorporation of appropriate measures to protect personal health information if applicable;
6. Data acquisition, implementation, and downstream analysis of study data, based upon of the final study design.

Students may select additional components for the practicum. These include experiences related to the conduct of biomedical informatics practice or research in its many aspects, such as participation as a member of a multi-disciplinary research team or an experience at an external site performing public health or medical informatics. These departures from the standard practicum format should be discussed and approved by the faculty academic advisor and the Department of Biomedical Informatics' Graduate Studies Coordinating Committee (BMI-GSCC).

### **Practicum Procedures**

The Master of Public Health requires a minimum of two credit hours of practicum for students in any MPH specialization. Students must spend at least 120 hours focused on the practicum to meet the minimum requirement (60 hours of work equals one credit hour). The hours may be distributed in whatever way makes sense for the student's schedule and the requirements of the work (e.g., 10 hours per week for 12 weeks, a varying schedule over multiple semesters, etc.).

BMI students are encouraged to begin discussions of possible practicum opportunities with their academic advisors and potential research/operational mentors as soon as possible after beginning the program. This will help the student's faculty academic advisor to suggest any courses they should take that might be critical to the success of their project in anticipation of the practicum. Once a practicum has been identified the Online Practicum Learning Agreement must be completed and submitted. Once submitted it will be routed to the preceptor and faculty advisor designated on the learning agreement for review and signatures. When all electronic signatures have been obtained the practicum course will be added to the student's schedule.

Please note that the practicum is not complete until the activity log, evaluation forms, demonstration product, and final report has been submitted and approved. The expectation for the MPH-BMI is that most students will complete the coursework required for the practicum within their first year and begin their practicum project the summer following the first year.

A maximum of two credit hours of practicum credit (7189) may count towards the degree. In some cases, BMI students may receive approval from the BMI-GSCC and their academic advisor to begin supervised research work before the normally expected timeframe. This can only occur with the express written permission of your academic advisor, who should work with the BMI-GSCC to confirm the exception.

The practicum is graded S/U. The grade is assigned by the academic advisor and posted by the CPH-OAPSS staff. Final grades are based on evaluations of the student's experience and final practicum report by both the academic advisor and the research mentor.

### **Practicum Report Guidelines**

All MPH students are required to complete and submit the following components for their practicum to CARMEN: All practicum forms can be found online on the CPH Practicum Page.

1. Activity log
2. Evaluation Links for student, preceptor and faculty advisor evaluations
3. Demonstration product in the form of
  - a. Presentation (e.g., power-point, research poster)
  - b. Written (e.g., manuscript, data collection instrument)
  - c. Audio/visual (e.g., recorded presentation, application development).
4. Final report (see below for more details)

### **Final Report**

The final written report should focus on sharing information on the practicum experience. At the conclusion of the practicum, BMI students will prepare a brief report discussing the relationship of their research to diagnosis, prevention, or treatment of disease and the overall relevance of their work to the mission of public health. You should discuss the expectations of your report carefully with your advisor.

The report's length needs to be sufficient to cover the expected content carefully, usually around ten pages in length.

The final report must represent your own individual work. Permission is required from your research mentor and faculty advisor to participate in a project with other BMI students. If you are working on a collaborative project, explain your area of responsibility and describe your contribution to the project.

The final report must present a clear picture of your practicum with details of your research or practice experience and how this practicum is important to the field of public health.

Please see the CPH Practicum student handbook for more information on the structure of the final report. For the BMI Practicum final report, be sure to address the following:

1. Underlying driving problems as well as corresponding information needs. What problem are you trying to address and how will Biomedical Informatics theories and

methods satisfy corresponding information needs? How will you evaluate the desired outcome?

2. What is your overall study design or project plan? Classify the design in terms of methodology and evaluation plans/approaches?
3. What bioethical issues are relevant to this project? What was your participation in the IRB process (if one was in place simply state; but discuss the ethical and human subject issues relevant to this project, if any).
4. Describe your plans for data collection, codification, and management.
5. What biostatistical and/or qualitative methods do you anticipate for the analysis of your any data collected?
6. Briefly discuss the public health and informatics relevance of your project or experience.
7. Indicate the 5 MPH competencies you focused upon and how you addressed them, utilizing competencies from the Integrative & Interdisciplinary list as well as the specialization list for Biomedical Informatics. The list of updated competencies can be found on the CPH website <https://cph.osu.edu/students/competencies>.
8. Include a description of your demonstration product within the practicum report and list the 5 competencies demonstrated by that product.

Your title page should consist of your name, division, cohort year (year you entered the College), practicum title (as stated in your learning agreement), research mentor (preceptor) and organization, your faculty advisor, and date of submission.

Both the faculty research mentor and the faculty academic advisor will be responsible for verifying the achievement of the practicum objectives and your performance. A final copy of the final written report and demonstration product should be provided to your faculty advisor and research mentor. Once approved, these should be uploaded to Carmen along with the log and evaluations.

Sample practicum reports are available for your review in OAPSS in 100 Cunz Hall, 1841 Neil Ave.

For advice on fulfilling the above requirements, please consult your faculty advisor.

## CHECKLIST OF REQUIREMENTS FOR THE BMI PRACTICUM

To be sure you are meeting all practicum requirements, **PLEASE** follow this checklist carefully!!

### Prior to beginning the Practicum:

\_\_\_ Attend a Practicum Orientation or meet with Dawn Williams in OAPSS to discuss paperwork and deadlines.

\_\_\_ Review the Integrated Practicum and Culminating Project Guidelines (*explains rules, contains forms*).

\_\_\_ Submit your protocol to IRB if appropriate.

\_\_\_ When Practicum is confirmed complete Online Practicum Learning Agreement found on the CPH Practicum website. Submission of the online practicum learning agreement will be done electronically to the faculty and preceptor designated on the form by the student for approval. When signatures have been obtained by both the practicum course will be added to the student's schedule. Practicum forms can be found on the CPH website at <https://cph.osu.edu/mph/practicum/forms-documents>.

### During the Practicum:

\_\_\_ Document progress on Practicum Log (*you must spend at least 120 hours on the research project*).

\_\_\_ Keep your faculty advisor and research mentor informed of your progress.

\_\_\_ Schedule a mid-practicum progress review with your advisor and research mentor; have any changes in the project approved by both.

### Final Preparation:

\_\_\_ Submit one copy of your final Practicum Report to your advisor and each member of your committee and to CARMEN.

\_\_\_ Submit an electronic copy of the final approved Practicum Report, Practicum Log, Demonstration Product, and Evaluations to the Carmen Practicum course site by the first day of final examinations for the semester.

Contact the Assistant Director/Coordinator of Practice Education and Career Services, Dawn Williams, with any questions or concerns: [Williams.3388@osu.edu](mailto:Williams.3388@osu.edu) (614) 247-4380

**Note: All Practicum forms and semester deadline dates can be found on the CPH website:**  
<https://cph.osu.edu/mph/practicum/forms-documents>

## **The Culminating Project**

### **Culminating Project Overview**

MPH-BMI students can satisfy the Culminating Project (CP), by completing a combined practicum and CP or as a stand-alone CP where the skills learned in the practicum can be applied to a separate culminating project. In a stand-alone CP, the student completes an appropriate informatics project including relevant data analysis. In the combined practicum and CP the research process initiated in the practicum continues and consists of the appropriate statistical analysis of the data collected within the practicum. These analyses are then reported in a final paper, which is to be prepared in scientific journal format. Though students may collaborate with others on the project, the final report must represent the student's own work

The Master's examination committee should consist of the faculty advisor and a second CPH or BMI faculty member (chosen after discussion with your faculty advisor). Both committee members must have category M or P Graduate Faculty status in the College of Public Health and at least one committee member must have a primary appointment in the College. An additional graduate faculty member may serve on the committee if the research mentor does not meet these criteria. Completion of the culminating project involves review and approval of the final report by the committee in addition to an oral presentation of the work to the committee. This presentation should be approximately 20-30 minutes, followed by discussion and questions from the committee.

Students may present their final work at the annual Graduate Student Research Day. In addition, they are encouraged to submit abstract summaries of their work at national meetings and to publish their findings in an appropriate peer-reviewed scientific journal.

### **Culminating Project Report Guidelines**

The final report for the culminating project must represent your own individual work. If you are working on a collaborative project, your final report must be some aspect of the project that you completed yourself and must be in the format of a peer-reviewed journal article.

The MPH-BMI culminating project final report should include the following elements:

1. Title Page
2. Abstract – brief summary of the project
3. Introduction and Background – rationale for the project; what is the basic research and why is it of interest
4. Literature Review – synthesize information written by other researchers and evaluation it according to the guiding concept that you have identified for your project
5. Methods – what were the methods and procedures used to collect and analyze data, what were the key variables of interest, and how were those variables measured

6. Results – describe the results of the data analyses and refer to any tables and figures within the text; reference any tables used from other sources
7. Discussion – interpret the data as they relate to project questions, goals, and objectives; discuss the implications of the findings and how they may impact public health

For more details on the culminating project report, consult your faculty advisor.

**TIMELINE AND CHECKLIST OF REQUIREMENTS  
FOR THE BMI CULMINATING PROJECT  
OHIO STATE UNIVERSITY COLLEGE OF PUBLIC HEALTH**

**Two semesters prior to the semester of completion:**

- \_\_\_ Discuss your culminating project with your faculty advisor.
- \_\_\_ Provide your advisor with an outline of your culminating project that includes the draft title, the public Health and informatics question that will be addressed and the methods for addressing the question.

**The semester prior to completion:**

- \_\_\_ Submit the [electronic permission form](#) to register for PUBHLTH 7998 for 3 credit hours during your second to last semester. This form will get electronically routed to your faculty advisor.
- \_\_\_ Work with your advisor to identify a second reader with appropriate Graduate Faculty status to serve on your master's exam committee **at least one semester prior to the semester of graduation.**
- \_\_\_ Submit the application to graduate [online](#) to the Graduate School the tenth Friday of the semester **prior** to the semester of graduation.

**The final semester:**

- \_\_\_ Meet with your faculty advisor and agree upon a timeline to complete the requirements for your project and schedule a time convenient for your committee for the presentation of your findings
- \_\_\_ Submit your final paper to your committee members at least 1 week prior to your scheduled presentation
- \_\_\_ The results of the Master's Exam must be submitted via [Gradforms](#) by all Committee members by [Graduate School deadlines](#)
- \_\_\_ Keep your advisor updated on your progress.
- \_\_\_ Submit an electronic copy (PDF or Word) of your approved project to [OAPSS](#) the Friday before graduation

## **Responsible Research Practice Requirements** (Appendix H of the CPH Handbook)

Many students in the College of Public Health and College of Medicine are involved in research, either for their own degree requirements or in work assignments with faculty members or others. It is essential that students learn and abide by the applicable rules concerning research involving human or animal subject. This topic will be covered in some courses as appropriate. This summary is intended to provide an overview. You are strongly advised to contact your faculty advisor or employer about the procedures described below.

### **What research is covered by this policy?**

All research that collect data from human subject needs to be approved by the OSU Institutional Review Board (IRB). All research involving animals needs approval from OSU Institutional Animal Care and Use Committee (IACUC). This includes culminating project, these and doctoral dissertations. In a few rare cases, practicum placements might also need approval if it involves collecting research-type data. When IRB or IACUC approval are necessary, such approval must be obtained before any data collection begins. Allow 6 weeks or more from submission to approval.

### **Research with human subject**

#### **When do project need IRB approval?**

The linked document from Ohio State's Human Research Protection Program defines clearly what constitutes "research" and what types of research require IRB oversight. The document can be found here: <http://orpp.osu.edu/files/2012/02/Research-Involving-Human-Subjects.pdf>. Pages 5, is very useful to help determine when IRB oversight is required. If your research seems to fall into a "gray area" not clearly covered by this document, contact Ohio State's Office of Responsible Research Practices for help.

#### **Procedures for human subject research approval**

Students should work closely with their faculty advisors to complete the necessary materials to secure approval for research with human subject. Guidance, forms, and directions are available through the Office of Responsible Research Practices: <http://orpp.osu.edu/irb/buck-IRB/>

All faculty, staff and students participating in human subject research at Ohio State are required to complete the Collaborative Institutional Training Initiative (CITI) web-based course on human subject available at <http://orpp.osu.edu/irb/training/citi>. The Office of Responsible Research Practices also offers regular training for researchers. Additional information is available on the Web at <http://orpp.osu.edu/irb/training/>. In addition to completing CITI training, everyone (faculty, staff, and students) involved in sponsored research or other research which is reviewed by the IRB must also complete a Conflict of Interest disclosure, which can be found at <http://go.osu.edu/coi>.

Some low-risk research may qualify for "exemption" from full IRB review; however, the determination that the research is exempt must be made by the university's Office of

Responsible Research practices (ORRP), and cannot be assumed by the student or investigator. Students who will be using data previously collected by faculty members for a theses, dissertation, or culminating project will also need to obtain IRB approval, frequently via the exempt status form. The form for requesting an exemption determination is available at <http://orrrp.osu.edu/irb/irbforms/exempt/>

One aspect of student research which should be noted is that for purposes of the IRB application, the student's advisor must be listed on the form as the "Principal Investigator," i.e., the person responsible for the research. The student is a "co-investigator." Both the student and the advisor must have completed the on-line human subject training (CITI). The IRB will not review an application unless everyone listed as principal or co-investigator has completed the on-line training.

### **Research with animals**

All animal protocols should be submitted in via the university's e-Protocol system. Directions to secure approval for research with animals are available through the Office of Responsible Research Practices. Approval requires completion of the Animal Usage Orientation Course (either classroom or online) and the Occupational Health and Safety Training Course (online only). Information regarding these courses is available online at <http://orrrp.osu.edu/iacuc/>.

### **Need assistance?**

You are encouraged to contact your faculty advisor or employer about research, including the requirements for responsible research practices. You may also speak with Bill Miller, PhD, Senior Associate Dean for Research in the College of Public Health, if you have questions or concerns.

If you have additional questions or need to discuss specific issues concerning research you are undertaking, contact:

Office of Responsible Research Practices  
The Ohio State University  
300 Research Administration Building  
1960 Kenny Road Columbus, Ohio 43210-1063

**Phone:** (614) 688-8457

**Fax:** (614) 688-0366

<http://orrrp.osu.edu/>

[Template for Practicum Report Cover Page]

## Practicum Final Report

Student Name  
MPH in Biomedical Informatics  
Entering Class of 20xx

Title

Research Mentor: Name  
Department, Organization

Faculty Academic Advisor: Name

Date Submitted

[Template for Culminating Project Cover Page]

Title

Student Name  
Entering Class of 20xx

Culminating Project for  
Master of Public Health in Biomedical Informatics

Committee Members:

Faculty Academic Advisor's Name

Research Mentor's Name

Additional Graduate Faculty Member's Name

The Ohio State University College of Public Health and  
College of Medicine's Department of Biomedical Informatics

Submitted on Date