Clinical and Diagnostic Sciences

Health Physics Program

Research Handbook

2025-2026

CONTENTS

INTRODUCTION

This handbook is meant to be guidance for health physics graduate students completing their thesis or non-thesis research projects. When in doubt, refer to the UAB Webpages on "[Completion of a Degree](#)" and "[Your Thesis and Dissertation](#)" for current deadlines, committee resources, defense information, templates, checklists, etc. This is your one and only official place for information. The information in this handbook is intended to provide guidance, but the UAB web page contains the up-to-date requirements and deadlines that must be followed and met to graduate.

In a nutshell, the UAB Graduate School recognizes two principal paths, Plan I and Plan II, which lead to the master's degree. Plan I is for those students that will complete a thesis. Plan II is for non-thesis students that will complete a graduate level capstone project that encompasses their education. Although thesis research is not required as part of a Plan II course of study, the student is expected to gain insight into the techniques of problem posing and problem solving and to use these insights to prepare a written report. A plan of study/course curriculum outline is required for all Plan II master's students when submitting the application for degree (before graduation).

Both Plan I and plan II options are available to health physics students and are discussed in more detail next. Note that the term "project" is used throughout and can mean the thesis itself or the non-thesis project depending on whether the student selects plan I or plan II.

PLAN I VS. PLAN II

The Plan I thesis option is for students interested in research or further graduate education. Plan I students complete original research work that is publishable in the open literature. Plan II is geared towards students that want to go straight into industry or that want to advance their current careers by obtaining a graduate degree. The Plan II option offers a shorter path to completion. Students should discuss their career goals with the program director and adviser *during their first semester of graduate school* to determine which path is appropriate for them individually.

RESEARCH OBJECTIVES

Both Plan I and Plan II options have a common set of qualitative and quantitative (i.e., measurable) objectives:

- Qualitative
  - Gain insight into problem posing and solving.
  - Display an initiative for lifelong learning.
  - Articulate the value of research to enhance the practice of health physics.
  - Recognize and acknowledge situations that result in a real or perceived conflict of interest.
- Quantitative
  - Demonstrate the ability to formulate a research question and an understanding of the research process.

- o Implement a research project or scholarly activity that will contribute to the field of health physics, with the project's rationale and objectives clearly defined and the research methodology outlined and described.
- o Plan and execute a thorough search and review of the literature. Read appropriate literature, identify resources, and generate a literature review that reflects organization, summarization, and synthesizing of information.
- o Learn to appropriately cite and reference published works.
- o Apply knowledge of research methodology/study design to critically evaluate research outcomes.
- o Learn to analyze data, interpret results, and apply lessons learned to the research question or project as applicable.
- o Produce grammatically sound, clear, and proficient scientific writing.
- o Communicate and collaborate with faculty committee to gather feedback, review project plans, and meet program deadlines.
- o Engage in self-reflection/evaluation of writing and the peer review process.
- o Experience presenting research findings or project outcomes to professionals through oral presentation and development of visual aids. Effectively give a presentation on health physics issues while assessing and determining the educational goals and learning objectives based on the needs and characteristics of the audience. Present using a delivery style that results in effective communication to the intended audience that is clear and unambiguous.

Specific requirements related to deadlines are found within this manual. Details regarding the process for choosing an acceptable project idea and producing an acceptable final manuscript are also within this manual, and should be discussed with your program director, adviser, and committee regularly.

PROJECT TIMELINES AND GOALS

Both plan I and II timelines are presented below. Note that each student completes a personalized timeline during their first semester as a graduate student as part of MHP 650 to ensure project and degree completion in a timely manner. These timelines will be reviewed and approved by the program director or student's advisor. The timeline is a living document, and should be consulted and updated regularly by the student in collaboration with their adviser and the program director.

Each semester's goals are represented in the following pages. These should be shared with committee members so that they are aware of the timelines students are working on. It is the student's responsibility to keep on schedule. These deadlines are the student's responsibility to maintain. Any legitimate inability to meet a deadline should be discussed with the program director and student adviser as soon as possible. Meeting deadlines is a common expectation for students, but is also important for professionals. Key deadlines for plan I students can be found here.

PLAN I

The plan I thesis can be completed within the four-semester time frame of the standard program. However, taking the thesis route will often require one or two extra semesters of time spent doing research and writing the thesis document to meet university deadlines.

A basic plan I timeline is provided below, but each student should develop their own individual timeline to ensure project completion within two years (six semesters). When developing your timeline, review this webpage carefully to ensure you have noted all important dates. The Graduate School also has a handy checklist. Use it!!

EXAMPLE PLAN I TIMELINE (SIX-SEMESTERS)

Fall Year 1: "WHAT will I do?"
- Meet with faculty and program director to discuss ideas, interests, career goals
- Complete MHP 650 Health Physics Research Methods
- Review this research handbook carefully
- Complete Institutional Review Board (IRB) / Institutional Animal Care and Use Committee (IACUC) training online and required readings (if needed)

Deliverable: Meeting with program director (PD) or advisor to discuss.

Spring Year 1: WHAT will I do?"
- Confirm project committee members
- Decide on topic/question/project
  - Begin literature search and review
  - Committee meeting to determine design/plan for implementation
  - Complete IRB/IACUC submission (if applicable)
  - Meet with statistics consultant (if needed)
- Complete MHP 653 Research Methods course
  - Complete written proposal describing project plan
- Set up regular meetings with project advisor

Deliverable: Submit Committee Form to UAB Graduate School.

Summer Year 1: "HOW will I do it?"
- MHP 699 (1-5 credits)
- Implement plan / start research
  - IRB/IACUC revisions (if needed)
  - Project materials development, if applicable
  - Literature review, if applicable
  - Regular faculty and committee updates related to the project
  - Start drafting manuscript (write introduction, lit review, and methods)
  - Data collection and analyze data as relevant
- Attend HPS annual meeting in July

Deliverable: Status update meetings with PD/Advisor. Apply for Candidacy with the Graduate School.

Fall Year 2: "NOW, I am doing it."
- MHP 699 (1-5 credits)
- Continue implementation of plan / research

Deliverable: Status update meetings with PD/Advisor.

Spring Year 2: "NOW, I am doing it."

- MHP 699 (1-5 credits)
- Continue implementation of plan / research
- Submit abstract to HPS or other conference

Deliverable: Status update meetings with PD/Advisor.

Summer Year 2: "SEE what I've done."

- MHP 699 (1-5 credits)
- Finalize research
    - Complete and final written thesis (see UAB thesis templates [here](#)) and provide to committee two weeks prior to defense date
    - Set defense date and publicize, see [here](#) for details and forms
    - Prepare submission for publication
    - Thesis presentation (open to public)
    - Finalize IRB Report if applicable
- Do paperwork, found [here](#). NOTE THE DEADLINES!
- Submit your Application for Degree in BlazerNET

Deliverable: Status update meetings with PD/Advisor. Apply to graduate and schedule your defense before the deadline.

PLAN II

All plan II projects should be completed within the four-semester time frame of the program for full time students. However, if a student is unable to fully complete their project but is making significant progress, an extension may be considered. The student must notify the program director in writing as soon as possible if they feel an extension will be needed. Any changes to the original plan for the student requires the student to work with the program director, advisor, and project committee to arrange for a timeline of the extension. The student must also remain registered for non-thesis research credits until the project is complete. If an extension is granted, the maximum extension period is one year. The student will graduate in the term in which they complete their project.

A basic plan II timeline is provided below, but each student should develop their own individual timeline to ensure project completion in the four-semester time frame of the program.

EXAMPLE PLAN II TIMELINE (FOUR-SEMESTER)

Fall Year 1: "WHAT will I do?"
- Meet with faculty and program director to discuss ideas, interests, career goals
- Complete MHP 650 Health Physics Research Methods
- Review this research handbook carefully
- Complete IRB training online and required readings (if needed)

  Deliverable: Meeting with program director (PD) or advisor to discuss.

Spring Year 1: "HOW will I do it?"
- Confirm project committee members (see Forms)
- Decide on topic/question/project
    - Begin literature search and review
    - Committee meeting to determine design/plan for implementation
    - Complete IRB submission (if applicable)
    - Meet with statistics consultant (if needed)
- Complete MHP 653 Research Methods course
    - Complete written proposal describing project plan
- Set up regular meetings with project advisor

  Deliverable: Meeting with program director (PD) or advisor to discuss.

Summer Year 1: "NOW, I am doing it."
- MHP 698 (1-5 credits)
- Implement plan / conduct research / complete bulk of project
    - IRB revisions (if needed)
    - Project materials development (if applicable)
    - Literature review (if applicable)
    - Regular faculty and committee updates related to the project
    - Start drafting manuscript (write introduction, lit review, and methods)
    - Data collection and analyze data as relevant
- Attend HPS annual meeting in July

> **Deliverable: Meeting with program director (PD) or advisor to discuss. Submit initial draft of research paper/project.**

Fall Year 2: "SEE what I've done."

- MHP 698 (1-5 credits)
- Complete and final written manuscript
    - Write results, tables/figures, discussion, and bibliography
    - Prepare submission for publication
    - Final presentation with committee and faculty
    - Submit final electronic copy to program director
    - Design poster for student presentations
    - Finalize IRB Report (if applicable)
- Submit abstract to HPS or other conference
- Submit your Application for Degree in BlazerNET

> **Deliverable: Written manuscript and committee presentation. Oral examination with MHP faculty.**

SELECTING A TOPIC

All project ideas must be approved by the Program Director or the student's advisor. Students are encouraged to select topics of personal and professional interest. All projects that require human data collection or patient participation must be approved by the IRB (see below on IRB requirements); for animals see the IACUC website.

Students are encouraged to choose an area of interest during their first semester of graduate school, as indicated in the timelines above. The program director or other faculty meet with students to discuss places for inspiration – which may include observations from the student's experiences, an area of interest arising from a literature review, ideas proposed by faculty, an area relevant for future career pursuits, or may come from a specific focus, such as a specified population or phenomenon that a student wants to investigate. All MHP students will also attend Research Days to learn about ongoing research and opportunities for students. This generally occurs each fall semester. Opportunities outside of UAB also exist, e.g., the Department of Energy Science Undergraduate Laboratory Internships (SULI) program as one example. If you are interested in outside research, notify the program director or your advisor when discussing your career path.

Upon the end of the second semester each student will have identified a topic and a project committee. During their second semester of the first year, they will complete the literature review and proposal for the project (exact timing varies, see timelines).

Faculty are kept updated about student progress and topics chosen at several points during the year. Even those faculty not working on student project committees can attend a lecture or discussion to be kept abreast of students' goals, timeline, examples of projects, and the opportunity to contribute project ideas.

LITERATURE REVIEW

Each student must do a preliminary literature search to determine if sufficient and current information will be available to complete the type of study/project under consideration. The information must be current and of sufficient quality and quantity to support the development of a paper with scientific rigor.

The literature review is a required part of the student's final manuscript, and should be reflected there. Progress and quality of the literature review is monitored in the MHP 650, 653, and 698/699 classes, and feedback is provided from committee members, the program director, and other MHP faculty. The goals of the literature review are to enable students to understand and explain the history of the issue, compare and describe relevant publications and existing perspectives of the issue, and describe the evolution of and need for their project idea and its potential to contribute to the field. The literature review is intended to outline the objectives/hypothesis of the project and lay the background for its methodology.

All references should be included in a "References" section of the project document (thesis or capstone report), a good literature review typically has a minimum of 30 references. Additional references will likely be used in other sections of the paper. The literature review process is likely to continue throughout the length of the project. See more information in the "Manuscript and Formatting" section of this manual. Tip – when you find a particularly relevant or interesting paper, go to its references list to find more papers on the topic! This makes it easy to find many papers in a given topic area. You may also find key authors in your area of interest.

LIBRARY RESOURCES

To support students in achieving the objectives for their project, orientation and training on library resources will be provided for students in the MHP 650 course. The orientation and training will include an introduction to electronic and paper journal resources at UAB, as well as university databases (with specific introduction to databases such as PubMed and OMIM). Students will learn about the Inter-library loan (ILL) program for obtaining papers free of charge.

ACADEMIC INTEGRITY CODE

The UAB Academic Integrity Code will be reviewed with students periodically throughout the program. Students are informed that any act of academic misconduct will also impact each member of their committee. Any act of dishonesty in academic work constitutes academic misconduct. Disciplinary action will occur if the student is found cheating on course papers or projects. Cheating includes plagiarizing, obtaining unauthorized old papers, giving or receiving unauthorized aid on course reports or projects, etc. Consequences of academic misconduct may include one or more committee members' withdrawal from the project, a failing grade in MHP 698/699 and/or dismissal from the program. The student's committee and the program director will work together to determine the appropriate penalty for academic misconduct on an individual basis.

The use of AI in research is tricky and should be approached with caution. You are responsible for the entirety of your research, thesis or capstone project written document, and any results you generate. Appropriate uses of AI will be discussed in MHP 650, 653 and other courses.

COMMITTEE AND ROLES

Plan I students are required to have a formal thesis committee, see "Graduate Thesis Committee" here for plan I requirements. Plan II students will have a designated advisor and at least two MHP faculty will serve on the oral examination board. Committee members for Plan I students are not limited to the MHP faculty or even to UAB faculty. Outside faculty are welcome, but must be approved by the graduate school. See the link above for requirements. One of the committee members must be a MHP program faculty member. The format of the project and requirements for successful completion of the project will be determined by the student, committee advisor, committee, and MHP program director. *The student is responsible* for forming the committee and for routinely communicating with them regarding the status of their project. Students should let the program directors know who they've asked to be on their committee and provide documentation of their commitment. This can be done via email communications. Students should confirm this is completed.

Committee meetings are scheduled by the student. The students are responsible for creating an agenda for these meetings and distributing them in advance. Students are also responsible for creating minutes from each meeting that documents the items discussed during the meeting. The minutes should be sent to all committee members within one week of the committee meeting. Meetings can be in-person or hybrid, and are organized to facilitate discussion about the plans for the project, progress of the project, development of the paper, and final presentation. Additional involvement through email revision of papers and email feedback is expected. It is expected that each committee will meet at least once each semester beginning in the Spring of the student's first year.

In most cases, the project committee advisor will be the project faculty member on the committee. While all committee members are essential to the development of a successful student project, the committee advisor is someone who has been designated to spearhead efforts with the student - specifically related to attention to time management and process supervision. Some projects may lend themselves to having another professional (not an MHP faculty) serve as the advisor, and this is acceptable. The selected advisor should be indicated on the proposal.

Under Plan I, the final examination should take the form of a presentation and public defense of the thesis, followed by an examination of the candidate's comprehensive knowledge of the field. The time, date, and location of this examination is reported to the Graduate School via the online Request for Thesis or Dissertation Approval forms and must be submitted at least 10 days before the public defense. The meeting must be appropriately announced on campus, must be open to all interested parties, and must take place before the posted semester Thesis defense deadline.

Plan II students should expect to conduct an oral presentation of their final project to their committee and be prepared to respond to questions. **The committee may request changes to be made to the project, paper, or the oral presentation of the project. These changes should be made in writing and should be provided prior to graduation. The oral presentation to the committee and other assigned presentations are intended to prepare students for possible future presentations at a professional conference. Any**

feedback or revisions resulting from the oral presentation will be provided in writing to the student. The program director will sign off on completion of the student's project prior to graduation.

Committee members should commit to being involved in the project through the time of graduation for the student. Students will all be responsible for getting each committee member's name and written commitment to the MHP program as part of their proposal.

STATISTICS

The [CCTS](#) (Center of Clinical and Translational Science) at UAB provides statistical help for students whose projects require data collection and analysis. To acquire a statistician's help on their committee, the student should send a paragraph description of their study/project to the program director or attend the CCTS drop-in clinic (see their webpage for details). The CCTS will identify the person best suited and able to help students with their data/stats needs. The student may plan to involve this person as a committee member, including rights to authorship as applicable.

INSTITUTIONAL REVIEW BOARD (IRB) / INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)

Once the project idea is laid out, determine if the project will require IRB approval. Start by reviewing the [UAB IRB website](#). Students are encouraged to meet with an IRB representative with any questions they may have about their application or plans (regarding recruitment, consent, forms, collaboration with non-UAB entities, etc.). The IRB website also gives **deadlines for their meeting dates**. If a strict deadline is anticipated for a student project, they may view the IRB website to confirm the deadline for their IRB submission. Students doing animal work may require [IACUC](#) approval.

As part of the MHP 650/653 courses, students will complete an Initial IRB Training, [CITI Basic-Biomedical or Behavioral-Course in Human Research Protections](#). Further training will be completed as required for each specific project.

PROJECT PROPOSAL

The project proposal (plan I and plan II students) is completed in the MHP 650/653 courses. The proposal is a single document that contains, at a minimum:

- Title of proposed research
- Research question/topic
- Preliminary literature review with references
- A list of committee members
- Timeline for project completion

IMPLEMENTATION

The bulk of project implementation is expected to occur during the Summer and Fall of the student's second year. Responsibilities for this will vary by project – but may include data collection.

You should consider *at least* the following topics as you develop your project:

- Abstract
- Impetus for study question
- Background lit review
- Aims of study
- Cohesive and organized writing
- Timeline
- Study Design
- Quantitative or Qualitative research
- Participants
- Procedures
- Survey
- Data Analysis
- Tables and Graphs
- Outcomes
- Application and Contribution
- Ability to generalize
- Strengths/Limitations
- Future Directions
- Flow and Grammar
- Accurate citations
- Formatting

DATA STORAGE

MHP students will use cloud storage for all project-related materials, including IRB materials, committee meeting agendas and minutes, raw data, and data analysis. Protected folders on UAB's SharePoint will be created by program faculty and shared with each student. UAB students, faculty, and staff can access cloud storage through their UAB account.

MANUSCRIPT AND FORMATTING

Plan I students must follow the specific thesis guidelines available on the Graduate School's [webpage](). Plan II students should format their written report in a professional format. They may use the thesis guidelines if desired.

Literature Review: An overview of findings from studies previously published on topic of interest or related areas, especially publications that address the key research question(s). May include basic description or background information on the topic under investigation. At least 10 references must be cited. Reference format is left to the student to select, just be consistent throughout the report. A reference manager is highly recommended.

Manuscript: The student will identify a target journal for manuscript publication. Guidelines and requirements for section content, length, and formatting are provided within the journal's guide for authors. It is recommended that the desired journal be selected first, then write the manuscript according to that journal's specific requirements. General manuscript information includes:

- Title Page – should include concise title, indicate authors, institutional affiliations, running header
- Abstract – accurate, self-contained, coherent. Review selected journal's instructions.
- Background – introduction, rationale, purpose/goals/hypothesis
- Method – study design description, qualitative/quantitative, IRB or approval process, participants/sites/recruitment method, method of collecting data, participants' actions,

other groups involved, materials/tools/instruments used, procedure taken/administration of survey

- Results – size/strength of relationships or results identified, writing statistical symbols and results in text is reviewed in APA manual, what statistical tools were used, what types of analyses run, what type of data was pursued/what groups compared/what type of output was generated, statistics, power, significance, tables/figures– captions and titles reviewed in APA Manual
- Discussion – re-visit rationale/problem, analysis and interpretation of findings, limitations/strengths, future directions, application to field (additional or fewer sections depending on journal requirements)
- References – should follow required journal style (order/formatting)
- Other – Include dedication page, acknowledgements page, table of contents, footnotes, and appendixes as needed.
- Data – According to research standards, you are expected to retain your data for 5 years after date of publication.

WRITING SKILLS

The graduate project gives heavy weight to professional writing and organization, with the goals of developing graduate level work. Any student who is not able to achieve that level may take it upon themselves to seek out additional help via a writing skills class or personal tutoring. While feedback on writing assignments will be provided, this graduate level project is not intended to be able to provide basic lessons on grammar and sentence structure. For a helpful website about grammar and sentence structure, visit the University of Ottawa's Writing Center. Students are encouraged to utilize the UAB University Writing Center to support the development of their professional writing. Additional information about classes offered at UAB or other resources is available from program directors.

OUTCOMES

Manuscript Paper: See details under next section "Submitting the Final Product." This step applies to all students.

Oral Presentations: Plan I students will hold a public defense of their thesis work as described here; deadlines for scheduling your defense are here. Plan II students will each hold a private oral presentation of their final project and outcomes with their committee and the program director. This should be planned and scheduled by the student. For room reservations, contact Dustin Shaw. See timeline guidelines provided for this meeting in previous sections. This should include an oral presentation with visual aids and should be open to feedback by the committee. The student is expected to consider all changes suggested by the committee during the oral presentation. All students should also present at the HPS annual meeting, held in July. Travel awards are available for students through the HPS.

Abstract submissions: Students are expected to submit their abstract for the HPS annual meeting. Students selected for presentation or poster at HPS, but who are unable to attend, should arrange

for a **committee member or program faculty to present their findings**. An abstract of each student's project is requested to be provided by the student to the program director for the UAB MHP program website. With the student's permission, this enables us to showcase student work and provide future and prospective students with examples of products from these projects.

Project: Students who did not go through the IRB process have likely undertaken a project that involves creation of a product or event. The expectations for its use or distribution should be outlined in each student's proposal and adhered to as planned.

Professional: All students are encouraged to submit a manuscript for publication in a professional journal and are given classroom opportunities for review of this by their instructors and committee.

Program: Before graduation, the program also requests a 1-2 paragraph summary of each student's project be provided by the student to the program director for the UAB MHP program website (this may be the abstract). With the student's permission, this enables us to showcase student work and provide future and prospective students with examples of products from these projects.

SUBMITTING THE FINAL PRODUCT

Plan I students should refer to the "Completion of a Degree" and "Your thesis and Dissertation" webpages for details on the thesis requirements.

After the oral presentation of the student project to the project committee, plan II students submit a completed version of the project paper that includes any feedback from the committee during the oral presentation to their project advisor and program director to determine its acceptability. Final electronic copies should be submitted to advisor and director. The project advisor will retain an electronic copy of the paper.

Plan II students do not submit their projects to the Graduate School. If original data was collected, the student will be encouraged to prepare a manuscript for submission to a journal or as an abstract for a professional meeting such as the HPS Annual Meeting. If the student decides not to submit for publication, then the student will be asked to complete a data release form so that the faculty may use the paper for preparing a manuscript/presentation.

Upon completion of all requirements and any further revisions, assuming the student is otherwise in good academic standing, the candidate is recommended for the master's degree to the Dean of the Graduate School using the Plan I/II form completion process. The submission of all forms to the Graduate School must meet the established deadlines of the University.

Students and faculty/committees should note that the final version of the student's manuscript that is required for the graduate program (and described in this manual) may not be the same as the final version used ultimately for publication. If students/committees desire to publish their manuscript (which is encouraged, but not required for the program) – revisions to the manuscript will likely be needed to fit with the specific journal requirements and the target length/audience of the journal chosen. Students may work on this second version while in the program, but will also be required to submit a "program" version of their manuscript. Students will need feedback from all co-authors of both versions of the manuscript (Program and Publication versions).

CONTACT INFORMATION

Program contact information is available in the MHP handbook or on the [MHP website](#).