University of Kentucky College of Medicine

Faculty Research Mentor Handbook
Master of Science in Medical Sciences

What is the MSMS degree? The Master of Science in Medical Sciences is a broad, flexible, interdisciplinary degree program that draws on the academic and research expertise of all members of the College of Medicine Basic Science Departments.

Who chooses to earn a MSMS degree?

- May be used as a stand-alone degree by students seeking career enhancement in fields such as basic biomedical research and the pharmaceutical industry.
- May be used by students seeking to bolster credentials in the biomedical sciences prior to applying for medical, dental school or other health sciences professional programs.
- May be used by students seeking to enhance their knowledge base prior to choosing a career direction.

How long does it take? The program can be completed in 3-4 semesters. Students will be required to identify a research mentor and let the director of the MSMS program know who they are working with during the semester they are registered for research credit.

What are the types of Master's degrees (as determined by the Graduate School)?

Plan A (Thesis)

- Plan A requires defense of a written formal master's thesis based on a bench research project (typically 25-50 pages) according to the guidelines established by the Graduate School.
- The complete thesis must be provided to the committee at least two weeks prior to the defense date. The latest in the semester a defense can be scheduled is 8 days before the last day of classes, as determined by the Graduate School.

What is my role as a faculty mentor?

1. Chair student's committee (must be a member of the Graduate Faculty to Chair. Associate members can be mentors, but on the committee a full member must be "Chair"). Masters committees typically consist of 3 members. At least 2 members must be from the College of Medicine. Mentors can help students identify other qualified committee members. The other committee members can assist in the development of the project and written document, but typically just participate in the final defense.
2. Supervise and direct 6 credit hours (typically at least two semesters) of research. Students should register for the graduate-level research course in the department that they are doing research.

3. Oversee the final defense. The defense consists of an oral Powerpoint presentation of the thesis research by the student and is conducted by a committee of three faculty members. It typically lasts 1-1 ½ hours.
4. Assign grade for research course each semester.

Plan B (Non-Thesis) **most common**

- Plan B does not have a formal written thesis but does require a final master's exam that involves a written document. The document should be at least 12-15 double spaced pages in length (not including title page, figures, and references).
- This document can cover a small **bench research** project or a **research paper (literature review)**.
- Papers covering a **bench project** should be written like a research manuscript (Abstract, Introduction, Methods, Results, Discussion, Conclusions/Future Directions). Depending on the amount of results generated, the Introduction and Discussion will likely be expanded to reach the required page length.
- Papers that are **literature reviews** (most common form of MSMS projects) should be written as a review paper (Introduction, Thesis Statement, Review of Relevant Literature, Discussion, Conclusions). This type of project can be mutually beneficial to the student and the Mentor and potentially submitted for publication.
- The report must be provided to the committee at least two weeks prior to the date of the exam. The latest in the semester a final exam can be scheduled is 8 days before the last day of classes, as determined by the Graduate School.

What is my role as a faculty mentor?

1. Chair the student's committee. Masters committees typically consist of 3 members. At least 2 members must be from the College of Medicine. Mentors can help students identify other qualified committee members. The other committee members can assist in the development of the written document, but typically just participate in the final exam.
2. Assist in development of the written project during the semester 3 credit hours of research. Mentors should meet with students regularly throughout the semester to guide and complete the document prior to the final exam.
3. Students register for the graduate-level research course in the department that they are doing the research. Mentors should let their departmental DGS know that they have a Master's student registered in the research class if they do not have access on MyUK to assign grades. Students with non-COM mentors can register for IBS609 (see Bridget for more information).

4. Oversee final exam. The master's final exam involves a Powerpoint presentation by the student that will serve as the basis for questioning about the research project or literature review by the three-member committee. It typically lasts an 1-1 ½ hours. Convey to the committee members the level of expectation of the product and exam (ie. Not on the same level as a PhD defense after one semester of work).
5. Assign final grade for research course credit. **NOTE**. Students do not have to take the final exam in the semester they complete the research paper (sometimes the end of the semester gets away from students). The exam can be scheduled any time classes are in session. If the mentor feels like the student made progress throughout the semester and just didn't complete the final exam, they can assign a research grade. If the student made unsatisfactory progress on the paper, they can be given an "I" until the work is complete.

***Questions? Contact*:**

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Masters of Science in Medical Sciences
Graduate Student Final Exam

Student: Date:
Committee Member:

SLO1: Foundational scientific knowledge

	Excellent 4	Good 3	Average 2	Deficient 1	Score
Able to recite learned knowledge and think intellectually about the direction of the project or research paper.	Demonstrates a thorough understanding of basic scientific knowledge in the research area.	Demonstrates an adequate understanding of basic scientific knowledge in the research area.	Demonstrates some understanding of basic scientific knowledge in the research area.	Demonstrates minimal understanding of basic scientific knowledge in the research area.	
Able to apply knowledge to answer questions and potential relevance to the project or research paper.	Demonstrates a thorough understanding of the scientific method, clear ability to generate hypotheses, understand and design complex experimental protocols, and analyze data with a clear and proper interpretation	Demonstrates a good understanding of scientific method, generating hypotheses, designing experiments appropriate for addressing hypotheses, and presenting data in an appropriate context.	Demonstrates some understanding of scientific method, needs assistance with complex experimental design and analyzing data, can present and interpret data with some guidance from the PI.	Demonstrates minimal understanding of scientific method, limited ability to conceive of experimental designs to address hypotheses, needs significant faculty input for data analysis and interpretation.	

SLO2: Analytical thinking by analyzing scientific literature

	Excellent 4	Good 3	Average 2	Deficient 1	Score
Able to critically analyze literature related to the project and think intellectually about the direction of the project or field.	Demonstrates a thorough understanding of knowledge in the project area and the ability to consistently discern meaning and relative validity of data in scientific publications. Clear demonstration of independent intellectual contribution, creativity, and original thinking.:	Demonstrates an adequate understanding of knowledge in the project area and displays many examples of the ability to discern meaning and relative validity of data in scientific publications. Demonstrates some insight and creativity	Demonstrates some understanding of knowledge in the project area and some ability to discern meaning and relative validity of data in scientific publications. Minimal evidence of original thinking.	Demonstrates minimal understanding of knowledge in the project area and is unable in most cases to discern meaning and relative validity of data in scientific publications. Lack of creativity or original thinking.	
Able to formulate relevant and testable hypotheses, devise clear experiments for addressing proposed hypotheses, and analyze and interpret data appropriately.	Demonstrates a thorough understanding of the scientific method, clear ability to generate hypotheses, and analyze data with a clear and proper interpretation	Demonstrates a good understanding of scientific method, generating hypotheses, , and presenting data in an appropriate context.	Demonstrates some understanding of scientific method, needs assistance with complex experimental design and analyzing data, can present and interpret data with some guidance from the PI.	Demonstrates minimal understanding of scientific method, needs significant faculty input for data analysis and interpretation.	

SLO3: Communication/Presentation Skills

	Excellent 4	Good 3	Average 2	Deficient 1	Score
Able to orally communicate data and interpretation effectively.	Articulates detailed understanding of project/paper and is able to orally communicate and defend new ideas, thinks effectively on his/her feet.	Has appropriate understanding of project/paper, is able to articulate ideas but lacks creativity, can think through basic problems when questioned, and in many cases can integrate knowledge appropriately to answer questions or solve problems.	Has a basic understanding of project/paper but lacks depth, answers basic questions but has difficulty thinking on his/her feet, and is sometimes able to integrate knowledge to answer questions or solve problems.	Lacks understanding of project and is not able to communicate rationale for interpretation of data or direction of the project, and is unable to draw from different areas or experiences to answer questions or solve problems.	
Able to communicate effectively through scientific writing	Demonstrates a thorough understanding of context and purpose of the scientific work; uses appropriate and relevant content to convey the contribution to the scientific discipline; successfully uses conventions particular to manuscript writing including organization, content presentation, formatting, and style; uses relevant and credible references; uses appropriate language that communicates meaning to readers with clarity and fluency, and is nearly error free.	Demonstrates adequate consideration of context, audience and purpose of the scientific work; uses many examples of appropriate, relevant and compelling content to convey the contribution to the scientific discipline; consistently uses manuscript conventions including organization, content, presentation, and style; consistently uses appropriate references to support ideas; uses clear language that generally conveys meaning to readers, with few errors.	Demonstrates awareness of context, audience, and purpose of the scientific work; uses some examples of appropriate, relevant and compelling content; follows expectations appropriate to manuscript and grant writing for basic organization, content, and presentation; attempts to use credible and/or relevant references to support ideas; uses language that generally conveys meaning with clarity, though with errors	Demonstrates minimal attention to context, audience, purpose of the scientific work; uses appropriate and relevant content to develop simple ideas in parts of the work; attempts to use a consistent system for basic organization and presentation; attempts to use sources to support ideas; uses language that sometimes impedes meaning because of errors in usage.	
Able to construct an effective oral presentation	There was a distinct introduction making it clear what the talk would be about and providing rationale for the work. The conclusion section was distinct with a summary of the important results and ideas, a clear take home message, applications to future work were clearly defined.	Mostly excellent elements with some deficient elements	More excellent elements than deficient elements	Important background information and rationale for the work was not clearly articulated in the introduction. The conclusions section was just a summary without the speaker putting the work into a larger context including how the results contribute to the scientific knowledge in the field and what future directions to take.	
Able to field questions effectively	The talk stimulated interesting questions, not just clarification of the work. Questions were answered appropriately. The speaker demonstrated a depth of knowledge about the field.	Mostly excellent elements with some deficient elements	More excellent elements than deficient elements	The speaker answered questions inappropriately due to failure to understand the question or a failure to understand the larger context of the field.	

Comments (optional):

University of Kentucky
College of Medicine

Faculty Research Mentor
Master of Science in Medical Sciences

MSMS Student _____ _____
Student Signature

Enrolled in departmental research class _____

I have read the attached expectations and agree to mentor the above MSMS student.

_____ _____ _____
Faculty Mentor Faculty Mentor Signature Date

Form is due to the Office of Biomedical Education either in paper or email form (bridget.szczapinski@uky.edu) by the deadline given in the Student Handbook.