

MASTER OF SCIENCE PROGRAMS IN

**BIOMEDICAL SCIENCES
CELL & DEVELOPMENTAL BIOLOGY
COMPUTATIONAL BIOLOGY & MEDICINE
FORENSIC BIOLOGY
FORENSIC TOXICOLOGY
HUMAN GENETICS & GENETIC COUNSELING
MICROBIOLOGY & IMMUNOLOGY
NEUROSCIENCE
PHARMACOLOGY**

THESIS GUIDELINES

Procedures for Completion and Presentation

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**THOMAS JEFFERSON UNIVERSITY
College Of Life Sciences
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THESIS GUIDELINES

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GUIDELINES FOR MASTER OF SCIENCE RESEARCH THESIS

The purpose of this Thesis Manual is to provide an academic procedural guide for the Master of Science student at Thomas Jefferson University College of Life Sciences. Procedures for preparation and approval of the research proposal, committee meetings, writing of the thesis and the oral presentation of the Master's Thesis are described. All necessary forms are provided in this manual.

Description

The thesis is guided study and research in the basic or biomedical sciences under Graduate Faculty supervision. Writing and oral presentation of thesis research is required.

Philosophy

Students should have the knowledge and skills to contribute to the scientific validation of their practice. This requires a thorough understanding of the research process including: review of the literature; formulation of the objectives and specific aims of the research; proposal preparation; development and execution of a research plan; data interpretation; and presentation and dissemination of results in a journal quality paper.

Responsibility of the Student

The student will:

- Identify a thesis advisor and, in collaboration with the advisor, identify and appropriate topic. Ideally this process should be initiated at least 1 year prior to the expected date of program completion:
- Submit a copy of the signed Milestone Stage Contract and Checklist to the MS Admin Coordinator, Kate Moran (Kathryn.Moran@jefferson.edu) and your program director each time you obtain a new signature. Keep the original for your records as a checklist of your progress and upcoming commitments (See Page 21). This form should be updated and submitted at various milestones during your program
- Review the literature of the proposed topic of research
- In conjunction with your Thesis Advisor, identify members of the Thesis Committee
- Develop a hypothesis and a research plan to test the hypothesis
- Submit a written proposal to the Thesis Committee explaining the question to be answered, the research plan, how the data will be analyzed, and listing the members of the Thesis Committee (See Page 5)

- Determine, in conjunction with the advisor and Thesis Committee, whether or not there are:
 - Any intellectual property, i.e., patent issues that might arise from the thesis research. TJU policy can be found at: <https://innovation.jefferson.edu/innovators.html>
 - The student is required to complete all related biological safety training.

Appropriate safety training can be identified by the research advisor, in consultation with the Biological Safety Officer, if needed. The student is required to familiarize themselves with laboratory-specific, Institutional Biosafety Committee (IBC)- approved protocols and biosafety standard operating procedures
 - Laboratory animals or animal tissues used in the thesis research.
 - If any portion of the studies will be carried out utilizing laboratory animals in vivo or with materials that are derived from animals at TJU,
 - the studies and the protocols must be approved by the TJU Institutional Animal Care and Use Committee (IACUC), and
 - the student is required to obtain appropriate training from Laboratory Animal Services and laboratory personnel on the care and use of animals in research, as well as the techniques to be completed using research animals
 - the student is required to consult with Jefferson Health Services to ensure appropriate vaccinations and health status to work with animals. Completion of a course on Health Stream might be required to work with animals.
 - the student is required to familiarize themselves with laboratory-specific, IAUCUC-approved protocols for their project
 - Human subjects or samples are involved.

If the topic of the research and hence the thesis involves human subjects, analysis of materials originating from human subjects, or data obtained from studies in humans (whether the work is carried-out at TJU or not) the TJU Division of Human Subject Protection must be contacted. This contact will help ascertain whether the TJU Institutional Review Board must be consulted. Policies and contact information can be found at: http://www.jefferson.edu/university/human_research.html
 - Prepare and present an oral presentation of the thesis proposal to the Thesis Committee (This is meeting #1). Submit the approved thesis proposal to your Program Director and the MS Administrative Coordinator, Kate (Kathryn.Moran@jefferson.edu) including a copy of the presentation slide deck.
 - Conduct the research plan
 - Meet with the thesis advisor and full Thesis Committee as described below. These meetings should be documented on the Record of Thesis Committee Meeting form (See Page #20) and noted on the Milestone Stage Contract and Checklist

form (See Page #21):

- Meeting #1: Proposal presentation to Thesis Committee
 - Meeting #2: Interim progress report (more than one interim progress meeting may be necessary)
 - Meeting #3: Oral presentation of the final results to the Thesis Committee for approval. Committee provides feedback on the Thesis document (submitted to them at least 2 weeks prior to the meeting) NOTE: this is not the formal public Thesis presentation.
 - Additional meetings may be requested by the student, or required by the committee, to discuss the progress of the project as needed to complete the objectives of the research.
- Submit a draft of the research Thesis to Thesis Committee for review and approval at least two weeks prior to Meeting #3. This draft should be in the advanced stages (i.e. nearly complete) and have been through many iterations by the student and thesis advisor before submitting to the full committee for consideration. Revisions suggested by the committee are to be made and revisions may be necessary before final acceptance of the thesis.
 - Upon approval by the Thesis Committee, Prepare and submit an abstract approved by your advisor (Page #11) to the MS Administrative Coordinator, Kate Moran (Kathryn.Moran@jefferson.edu) by the deadline in order to schedule a formal public thesis presentation. These public presentations are held in April, July and November. Check with the MS Program Office for abstract submission deadlines and dates for presentations.
 - Submit a final **bound** copy of the thesis with the signature page, signed by the Thesis Committee, to your Program Director and the MS Admin Coordinator, Kate Moran (Kathryn.Moran@jefferson.edu) This should be done on the day of the formal thesis presentation. A copy in PDF format is also required as part of the final submission requirements.
 - Forms for use during the research and thesis process are included in this document and are also available in the Appendix.

THE THESIS COMMITTEE

Membership of the Thesis Committee

There are to be a **minimum of three persons on the Thesis Committee. One of the members must be a member of the Graduate Faculty** of Thomas Jefferson University knowledgeable in the area of the thesis. The primary advisor may be a researcher at Thomas Jefferson University, a clinician with strong research interests, or a qualified scientist outside of the institution who has been approved by the student's Program Director. The primary advisor should be a PhD (exceptions should be discussed and approved by the program director). Postdoctoral researchers in the lab may be members of the Thesis Committee. Students are required to identify the thesis advisor and committee members in collaboration with the Program Director. Thesis Committee members who are not on the Jefferson faculty must work in close communication with the Graduate Faculty member of the Committee. In most cases, the primary advisor is the investigator directing the activities in the laboratory or department in which the student will be working on the thesis. The other committee members should provide content or other expertise relevant to the project. If the student is conducting their Thesis research off-campus, the program director will serve as the Jefferson faculty member on the committee.

Purpose of the Thesis Committee

The purpose of the Thesis Committee is to guide and advise the student in research. The primary advisor must be aware of the specific expertise that the proposed Thesis Committee members will contribute toward the student's scientific growth and development as well as the student's projected research activity. The primary advisor shall act as Chair of the committee. The proposed committee composition must have the necessary expertise in the area of the thesis. The thesis committee also serves as an advocate for the student to mediate conflicts that might arise between the student and the advisor during the project.

Thesis Committee Meeting

The Thesis Committee meetings provide an opportunity for the student to get guidance from the committee. Scheduling of the meeting and securing a location is the student's responsibility. These meetings include a PowerPoint presentation by the student, sometimes with an update emailed to the committee prior to the meeting. It is recommended that the proposal meeting take place with all members physically present; however, having a member attend by conference call is acceptable. The Proposal meeting is to present the proposal and get input on the project to make it the best project possible. The Committee may suggest revisions. It is important to have this meeting early in the process. The student is not required to have preliminary data for the proposal. The second meeting is typically a progress report. If there are problems with the project (and there is little or no progress to report), this is also a good time for a second meeting to get guidance from the Committee. At this meeting, the Committee typically decides what the student needs to do in order to finish the project. The third meeting is a final report to the committee, summarizing the project, data, results, and conclusions. An advanced draft of the thesis should be emailed to the committee at least two weeks prior to this meeting in order to get feedback at the meeting. The student is responsible for providing the necessary signature pages at each meeting and submitting a one page summary of the meeting and the PowerPoint presentation. Thesis forms and summaries should be submitted to the MS Administrative Coordinator, Kate Moran (Kathryn.Moran@jefferson.edu) following each meeting.

THESIS PROPOSAL

The purpose of the proposal is to clearly and concisely answer the questions **WHAT**, **WHY** and **HOW**. The proposal, by itself, should explain the purpose of the research, the hypothesis and how the objectives will be accomplished. Typical proposals are seven to 10 double-spaced typed pages in length but may be longer. Format for the proposal is detailed below.

Proposal Format

Proposed Thesis Title

This may be a provisional title, but it should be sufficient to orient the advisors and Committee to the topic of the students proposed research.

Introduction

This section should answer the **WHAT** and **WHY**. It should describe the specific objectives of the research. It should establish the necessity of the research by summarizing the previous studies that have been done on the subject, the available information, and deficiencies in this information. It should also relate the significance of the proposed research to the existing knowledge of the field.

Hypothesis

A formal statement of the question to be addressed by the thesis research.

Experimental Design and Scope

This section should describe **HOW** the question will be addressed and how the hypothesis will be tested. An individual reading the proposal should be able to determine whether the protocol design will adequately accomplish the research. The members of the Thesis Committee should be able to determine from this section whether or not the research project is feasible with respect to time, resources and expertise. The specific steps do not need to be described, but the type of procedure, materials, instruments, and method of evaluation should be clearly stated.

Bibliography

A bibliography based on the current literature should be included. Pertinent journal articles and reference tests should be cited using the format of a major scientific journal. A minimum of 10 references should be included.

Students should set-up a bibliography database while writing the proposal. Dedicated reference database programs should be used. RefWorks and Training courses are available through Scott Memorial Library or online. The student can use other reference database programs as used in the thesis lab.

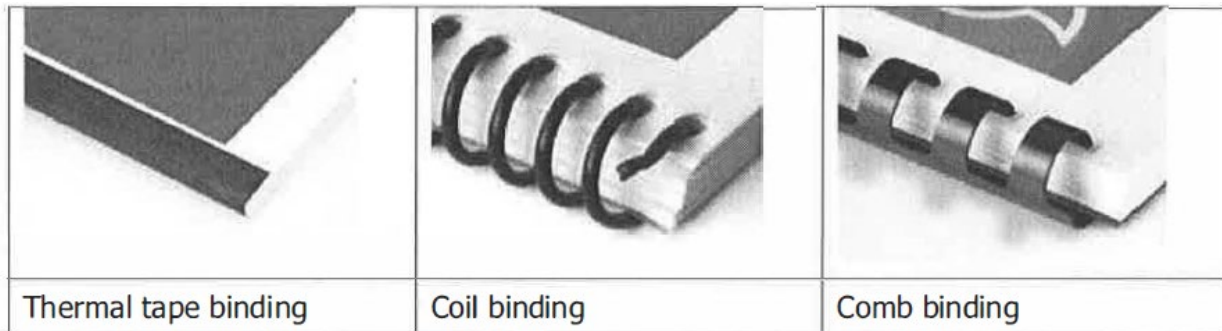
RESPONSIBILITIES OF THE THESIS ADVISOR

- To ensure that the student has all required training, including biosafety and the care and use of animals.
- To ensure that the student has all required vaccinations and clearance from University Health Services needed to work with animals and some pathogens, if needed
- To assist in the development of the proposal for approval by the committee
- To ascertain adequacy of the literature search
- To ascertain whether intellectual property, IACUC and IRB issues need to be resolved and authorizations obtained prior to proceeding with the project design.
- The students should participate in the preparation of the necessary forms as part of the learning experience, but the advisor may need to be the official contact for University purposes.
- To assist the student in the project design including necessary revisions
- To instruct, demonstrate, or make available to the student technologies, equipment, instrumentation, sample for testing, or laboratory space as needed for the completion of the project
- To guide the student in data interpretation
- To guide the student in the preparation of illustrations, graphic presentations, etc.
- Training courses are available through Scott Memorial Library in PowerPoint and Photoshop
- While it is ultimately the responsibility of the student to be motivated and reach closure on their research and writing of the thesis, it is expected that the Thesis Advisor will exercise the supervision necessary for the student to complete the project on schedule. This should also include making sure that all relevant forms are signed on-time and that the Milestone Stage Contract and Checklist stays current; this includes both the students copy and the one in the students files in JAH M-46 with the MS Admin Coordinator, Kate Moran (Kathryn.Moran@jefferson.edu).
- To collaborate with members of the Thesis Committee in the Final evaluation of the project.

The Thesis advisor is responsible for the overseeing that an appropriate level of scholarship is exhibited by the thesis. The thesis must demonstrate a high degree of professional and scientific competence. The candidate's Thesis Committee can provide the student with the guidance and instruction necessary to achieve this competence. The Thesis Committee should meet regularly to evaluate progress during the student's period of research activity. While three meetings are required, more may be necessary. Records of these meetings must be submitted to the MS Admin Coordinator, Kate Moran at Kathryn.Moran@jefferson.edu and your program director.

RESEARCH THESIS FORMAT

The final version of the thesis should incorporate all necessary changes and corrections stipulated by the Thesis Committee. One bound copy of the thesis containing original photographs and illustrations should be submitted to the MS Program Office, M-46 Jefferson Alumni Hall, on the day of the thesis presentation. Various binding options are available at local commercial venues (FedEx, Staples or Creative Characters [minimum of 5 copies required for binding]) Acceptable types of binding are shown in the illustrations below:



An electronic version of your full thesis in PDF format is also required so that the thesis may be posted on the Jefferson Scott Library Digital Commons for public access. If your thesis needs to be temporarily embargoed for patent reasons, please provide a release date when you submit the electronic version on a CD-ROM or flash drive. A bound copy of the final thesis should be given to each member of the Thesis Committee. All copy including footnotes, legends, figures, tables and the bibliography should be typed double-spaced on one side of 8.5" by 11" bond paper. Margins should be at least 1" on all sides. Any legible standard type face or font is allowed as long as it is consistent throughout the document. Suggested type fonts and pitches are: Times 12; Tahoma 10; Arial 10; and Verdana 10.

The general format is as follows:

TITLE PAGE

- Include title, student's name, date, program and instructional affiliation, the Thesis Advisor's name and a listing of all Thesis Committee members.

DEDICATION

- Optional

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

ACKNOWLEDGMENTS

- This page expresses appreciation for all those who assisted the student and mentions any permission obtained to quote copyrighted material and any funding sources, *e.g., NIH, NSF, etc.*

ABSTRACT

- The abstract should briefly describe: 1) the focus of research and the hypothesis; 2) experimental design and methods of data collection; 3) summary of findings and; 4) conclusions. The abstract may also be used for the oral presentation submission (see Page #15 for sizing requirements).

INTRODUCTION

- States the objectives and aim of the research and relates the project work to an existing body of knowledge on the subject. (Review of literature, statement of the problem)

MATERIALS AND METHODS (EXPERIMENTAL DESIGN)

- This section is an expansion of the same section in the proposal. After reading this section a scientist should be able to replicate your work. Previously published procedures should be referenced in the bibliography.

RESULTS

- Present the collected data and its analysis.

DISCUSSION

- Include data interpretation and conclusions drawn from your findings. The discussion should accurately reflect the project findings such as unexpected results, etc. and relate these findings to existing knowledge on the topic. Any difficulties encountered in the research or recommendations for further study should also be included.

BIBLIOGRAPHY OR LIST OF REFERENCES

- Every reference cited in the text must appear in the bibliography. Pertinent journal articles and reference texts should be cited using the format of a major scientific journal. If the thesis is planned to be submitted for publication in a journal, the format required by that journal can be used for the format of the thesis. This information (Information for Authors) is published annually by each journal and will also be available at the journal's web site.

RESEARCH THESIS EVALUATION

The final research thesis will be evaluated by the Thesis Committee (see The Thesis Committee section – See Page #5.) Evaluation will be based on:

- Appropriateness of the research;
- Adequacy of the literature search;
- Organization and execution of the research plan;
- Research scope and level of difficulty;
- Validity of conclusions;
- Quality and thoroughness of the written thesis;
- Adherence to deadlines

SUBMISSION OF WRITTEN THESIS AND ORAL PRESENTATION

A public research seminar is scheduled for the presentation of the thesis by the candidate. This presentation is required for graduation and must be on the TJU campus. The candidate must demonstrate competence in their specific area of research. The thesis research is presented to the audience in an oral presentation with accompanying graphics. The candidate must display the ability to answer questions pertaining to the study for those in attendance. If however, there are proprietary information concerns involving the public presentation of the candidate's research, a closed seminar may be arranged.

Presentations are scheduled three times each year: April, July and November. Students who present in April and have completed all other requirements for graduation will be eligible to graduate in May of the same year. Student who present in July or November, for whom this is the last requirement to complete their program, will be invited to attend the graduation ceremony in May of the following year. Degrees are also conferred on August 31 and December 31 of each year.

- The student should provide committee member with advanced draft version of their thesis at least two weeks prior to the final committee meeting. Photographs, graphs, illustrations, and tables need not be the originals for this final draft copy of the thesis. The draft must have sufficient context to allow the committee to determine if the student will be able to complete all the requirements prior to the submission of an abstract for presentation.
- Students need to incorporate suggestions from the Thesis Committee into their written thesis for the final version. Student may have to present more than one draft of the thesis to their committee.
- Only student who have completed their thesis research and have had the thesis approved by their committee may make the oral presentations. This will be

- evidences by the submission of the signed Milestone contract for this event (See Forms Appendix)
- The final Thesis Committee meeting should occur **prior** to submitting the abstract for the final oral presentation. The abstract should be approved by the thesis committee. The thesis committee may delegate approval of the final abstract to the thesis advisor.
 - Approved abstracts should be submitted to the Program Office 4 weeks prior to the scheduled thesis presentation. The Program Office sends out instructions and abstract submission deadline for the thesis presentations. The abstract is to be submitted online using the instructions below. The abstract must be provided to the MS Program Office prior to the presentation so that it may be posted on the web.

GUIDELINES FOR PREPARING A THESIS PRESENTATION ABSTRACT

By convention, scientific abstracts have a precise format. This makes it easier for the reader to quickly and efficiently grasp the complex scientific content of these short summaries. In preparation the abstract, single-spaced all items. Use the Tahoma 11-point font for the document. Do not indent or otherwise format any part of the abstract. Please be aware that the abstract will be published on the Thomas Jefferson University College of Life Sciences web page prior to your formal oral presentation of your thesis. According to the Jefferson Office of Technology Transfer, publication of your abstract on the TJU webpage constitutes disclosure of your research

You must notify us if you and your Advisor **do not** wish your abstract to be posted on the TJU webpage.

Obtaining a Thesis Presentation Abstract Template

- 1) The abstract form is available on the JCLS website under POLICIES AND GUIDELINES (<https://www.jefferson.edu/academics/colleges-schools-institutes/life-sciences/student-resources/policies-guidelines.html>) and can be downloaded. The template will be called “MS Basic Sciences Thesis Abstract Form” and is in MS Word format. The document will be set as “read only,” which means that you can open the file but cannot modify it.
- 2) To work with the file, open it. Once it is open save it under a different name on your computer. In other words, use the “File|Save as” function from the toolbar. When prompted, give the file a new name. It will be saved on your computer without read/wrote restrictions. **Do not** change any settings on their file expect for its name.
- 3) If you think you have done something to “ruin” your working copy of the template file, simply repeat No. 2 above to generate a new copy.

Title Information

- Capitalize the entire title.
- List the Authors' names: Use initials without periods for the first and middle names, not the full names.
- The **only names** on the abstract should be your name (underlined), and your thesis advisor.
- Provide department and institutional affiliations for you and your advisor as per the example of Page #14.

Abstract Proper (Body of the Abstract)

- Organize the body of the abstract in this fashion;
- A statement of the study's space (one sentence);
- A statement of the methods used;
- A summary of the results obtained, presented in sufficient detail to support your conclusions;
- A statement of the conclusions reached. Note that it is **not** satisfactory to state, for example, that "the results will be discussed," or that "other data will be presented."
- The entire body of the abstract, i.e., the entire abstract except the Title Information, **must** be in a single paragraph. DO NOT separate "methods," "results," or "conclusions" into separate paragraphs. Figures and tables are not permitted in the abstract.
- See the example on Page #14.
- The entire abstract (Title Information and Body of the Abstract) **MUST** fit into a space 4.5" wide and 7.0" deep when formatted with the 11 point Tahoma font. If your material does not fit, **you** must shorten it. The MS Program Office **will not** edit your abstract to make it fit the template. You **may not** use a smaller font or a different font in order to make the abstract fit the template.

Submitting the Abstract

Your abstract must be submitted as a computer file in Microsoft Word. You may submit it *via* e-mail or in person *via* a flash drive. Send the file as a file attachment in an e-mail directed to Kate Moran; Kathryn.Moran@jefferson.edu. To ensure that we properly file and assign your abstract to the correct program, please submit your abstract with your last and then first name and finally the program name and abbreviation as the actual file name in the following format:

FILE NAME FORMAT FOR FINAL ABSTRACT SUBMISSION

LAST_FIRST_BS.doc	Biomedical Sciences
LAST_FIRST_CB.doc	Cell & Developmental Biology
LAST_FIRST_CM.doc	Computational Biology & Medicine
LAST_FIRST_FB.doc	Forensic Biology
LAST_FIRST_FT.doc	Forensic Toxicology
LAST_FIRST_HG.doc	Human Genetics & Genetic Counseling
LAST_FIRST_MI.doc	Microbiology & Immunology
LAST_FIRST_NS.doc	Neuroscience
LAST_FIRST_PR.doc	Pharmacology

SAMPLE ABSTRACT

DIAGNOSTIC POWER OF CIRCULATING TUMOR PROTEINS AND PHYSIOLOGICAL PARAMETERS TESTED IN AN IMMUNODEFICIENT RAT ORTHOTOPIC HUMAN LUNG CANCER

MODEL. HJ Millar-Quinn¹, E Wickstrom²

¹Discovery Research, Centocor R&D, Inc., Radnor PA. ²Department of Biochemistry and Molecular Biology, Thomas Jefferson University, Philadelphia PA.

Clinically relevant animal models of human cancer that allow tumor growth and metastasis to closely mimic that of human disease are necessary for the evaluation of putative therapeutics. Presently, there are no animal models for human lung cancer that both mimic human disease and show clinically relevant protein biomarker activity. It is hypothesized that circulating levels of lung cancer-associated proteins will correlate with physiological measurements from an orthotopic H460 human non-small cell lung carcinoma (NSCLC) model in immunodeficient rats. An orthotopic lung cancer model was developed in the nude rat, using intratracheal instillation of H460 cells. In-life measurements, blood gas, and blood analytes from naive and tumor-bearing animals were measured over time. Serum samples were collected from these animals to quantitate circulating human IL-8, p53, VEGF, and MMP-9, which were correlated with in-life measurements to track disease progress. MMP-9 and p53 were not significantly detectable in the serum. Circulating human VEGF was detected at high levels on the day of death in some of the tumor-bearing animals. Human IL-8 was detectable in all tumor-bearing animals and showed correlations with markers of respiratory acidosis (pH, $P=0.012$; TCO_2 , $P=0.024$; PCO_2 , $P=0.007$; and

HCO₃, $P=0.029$), and with surface body temperature

($P=0.001$). IL-8 significantly correlated with survival ($P<0.001$), indicating an association with tumor burden. Circulating IL-8 may be a useful clinically-relevant tumor protein marker, due to its correlation with multiple physiological parameters associated with disease progression, which is consistent with the original hypothesis.

The final bound copy & PDF of the Research Thesis must be submitted by the day of the presentation to the MS Admin Coordinator, Kathryn.Moran@jefferson.edu.

GUIDELINES FOR PREPARING FOR THE MS ORAL THESIS PRESENTATION

The Jefferson College of Life Sciences will provide a computer, laser pointer and digital projector for your MS Thesis presentations. You must adhere to the following guidelines:

1. Presentations must be done in Microsoft PowerPoint. The computer provided runs the Office 2010 version of PowerPoint and is backward compatible to previous versions.
2. PowerPoint files should be submitted as an attachment in an e-mail addressed to: Kathryn.Moran@jefferson.edu
3. If the files are too large for e-mail you may submit your presentation on a flash drive in person at the MS Program Office (JAH M-46).
4. PowerPoint files must be emailed prior to the presentation. You will also need to bring a copy the day of your presentation
5. If you generated your PowerPoint presentation on a Mac please load it on a Windows-based machine, convert it to the Windows version of PowerPoint and make sure the fonts, tables and graphs have all converted properly. This is especially important for special characters and symbols.
6. If you are presenting movies embedded in your PowerPoint slides please make sure we have the same software program and version available on the presentation computer, e.g, *Windows Media Player, Quicktime, etc.*
7. Your presentation should be a maximum of thirty (30) minutes in duration: 20 minutes for the presentation and approximately 10 minutes for questions and discussion. If you go over your allotted time, you will be asked to stop so we can move on to the next presenter.

TIPS FOR EFFECTIVE PRESENTATIONS USING FOUR IMPORTANT DESIGN CONCEPTS:

BIG
SIMPLE
CLEAR
CONSISTENT

If you pay attention to these four concepts as you put the visuals together, the end products will be effective

1. Make it **BIG**

Test: can you read everything for the back row?

2. Keep in **SIMPLE**

Guidelines for text on visuals

- No more than 6 lines of text per slide
- No more than 7 words for line of text

We all tend to put too many words on our slides at first. Use the above guidelines to get rid of unnecessary texts. Your audience can read faster than you can talk; you don't want their attention split between the slide and you (using 'builds' in PowerPoint can help control the audience's attention).

3. Make it **CLEAR**

Choose fonts, font sizes and colors that enhance readability of your slides. Most of PowerPoint's default font sizes and color schemes work well; if you decide to experiment with your own, be sure not to reduce readability in the process.

4. Be **CONSISTENT**

Your goal should be to educate and inform your audience. Make sure the stages of your presentation, and the visual aid you use, follow a logical sequence. Use transitions to help the audience understand how successive stages are related to each other, and to the big picture.

A final word of advice:

1. Begin preparing your visuals early
 - Allow enough time to make any necessary changes
 - Project the visuals to verify content, spelling, sizes and colors
 - Practice the presentation with the visuals
 - Take the time to reconsider the presentation as a whole
2. When using the computer, make frequent back-up copies of your PowerPoint presentation.
3. Practice your presentation. A lot. You want to be able to speak it, not read it.
4. Two cardinal rules of public speaker:
 - Never turn your back on an audience
 - Always maintain eye contact with your audience
5. Know your environment
 - Check out the lighting and plan how you (or someone else) will control it:
 - Do you need a pointer? A podium? White board? An internet connection? Arrange for these in advance.
6. Other things: Room temperature, noise, seating arrangement:

If there is unfamiliar equipment, ask to have someone demonstrate it for you, or ask to have them operate it for you during the talk. Don't fiddle during the talk.

Backup: Electronic equipment sometimes fails. Be mentally prepared to cover yourself for 5-10 minutes while equipment problems are resolved or the equipment is replaced.

Source: Columbia University Department of Psychology

FORMS APPENDIX

RESEARCH PROPOSAL APPROVAL FORM

The attached Master's thesis proposal has been submitted by

Print your name in the space above

Student Signature

Date

A student in the Master of Science Program in

Print the name of your program in the space above

The following persons have agreed to serve as members of the Thesis Committee and have found that the student has sufficient knowledge in the field to proceed with the proposed study toward completion if the Master's research thesis requirement.

SIGNATURES OF THESIS COMMITTEE MEMBERS

Print name above

Affiliation

Signature

Date

Print name above

Affiliation

Signature

Date

Print name above

Affiliation

Signature

Date

Print name above

Affiliation

Signature

Date

RECORD OF THESIS COMMITTEE MEETING



Meeting 1



Meeting 2



Meeting 3



Meeting ___

Student _____ Program _____

To the student:

- Have your committee members sign this form after the meeting
- After the meeting, prepare a 1 page summary including recommendations from your committee members. Have your thesis advisor initial the report
- Send this form, the initialed summary attachment, and your PowerPoint slide file to the MS Admin. Coordinator, Kathryn.Moran@jefferson.edu

Date of Committee Meeting: _____

Student Signature

Thesis Advisor's Signature

SIGNATURES OF THESIS COMMITTEE MEMBERS

Thesis Committee Member

Thesis Committee Member

Thesis Committee Member

JEFFERSON COLLEGE OF LIFE SCIENCES
THOMAS JEFFERSON UNIVERSITY

SIGNATURE SHEET

STUDENT _____

Candidate for the degree of

Master of Science

Has successfully completed the final copy of the Master's research thesis in the field of

	Biomedical Sciences
	Cell & Developmental Biology
	Forensic Biology
	Forensic Toxicology
	Human Genetics & Genetic Counseling
	Microbiology & Immunology
	Neuroscience
	Pharmacology

We have found that the candidate has successfully completed the requirements for the Master of Science Research Thesis thereby demonstrating knowledge of the skills needed to contribute to the scientific validation of their practice.

Name

Date

MILESTONE STAGE CONTRACT AND CHECKLIST

NAME: _____ Campus Key _____ Program _____

ACTIVITY	DATE	STUDENT INITIALS	ADVISOR INITIALS
Identify thesis advisor. NAME: _____ Affiliation: _____			
Identify members of the Thesis Committee 1. Thesis Advisor 2. _____ 3. _____			
Submit written proposal for thesis project			
Additional approvals as needed: Intellectual Property IACUC (Animal Use) IRB			
Oral presentation of thesis proposal to Thesis Committee			
Approval of thesis proposal			
Thesis Committee Meetings: (Email thesis documents to your Program Director and MS Admin. Coordinator - Kathryn.Moran@jefferson.edu immediately following each meeting)			
Meeting #1			
Meeting #2			
Meeting #3 (Defense of Thesis)			
Additional meeting date(s) as needed: _____			
Write thesis and rewrite thesis with advisor's help			
Revisions if necessary and Final Approval of Thesis by Committee			
Schedule Appointment MS Admin. Coordinator Kathryn.Moran@jefferson.edu to insure all records are current and all course requirements have been fulfilled			
Schedule date for final public thesis presentation (April, July, November)			
Submit abstract to MS Admin. Coordinator Kathryn.Moran@jefferson.edu (March 15th, June 15th, October 15th)			
Final Public Thesis Presentation			
Submit a final bound copy and PDF copy of thesis along with signature page to the MS Admin Coordinator - Kathryn.Moran@jefferson.edu			