

1.0. Proposal Defense – Overview of Examination Process

The proposal defense will be conducted within 18 months of a student passing their qualifier examination. The proposal defense will involve the submission of a formal research proposal to the student's research committee. Guidelines for the preparation of the written research proposal are provided below. The student's research committee will be composed of the student's primary research advisor and at least three other faculty members who will be selected by the student and the student's advisor. Each faculty member on the proposal defense committee must be listed on the student's GS2 form, or be representing a faculty member who is listed on the GS2 form. At least 50% of the committee must be faculty members whose primary appointment is in the Department of Bioengineering at Clemson University. The student's primary research advisor will serve as the chair of the proposal defense committee if the advisor's primary appointment is in the Department of Bioengineering. If not, then another member of the committee whose primary appointment is in the Department of Bioengineering will serve as the committee chair.

The written research proposal will be submitted to the proposal defense committee at least two full weeks prior to the scheduled proposal defense. The proposal defense will be a closed meeting between the student and the members on the student's proposal defense committee. The proposal defense will consist of the student making an oral presentation to their committee (about 30 minutes in length), following which the committee will ask the student questions about the proposed research and any issues that the committee believes to be pertinent to the proposed research. After the committee decides that the questioning period is completed, the student will be dismissed from the room in order for the committee to deliberate regarding the outcome of the examination.

The outcome of the examination may be an unconditional pass, a conditional pass along with designated conditions (e.g., additional course to be taken with a grade of A or B, independent study and report to the committee), or failure of the examination. If the student fails the examination, the committee will decide whether or not the student should be provided another chance to retake the proposal defense examination. A student will not be given more than two chances to retake the proposal defense examination. After the committee has deliberated, the student will be invited back into the room and informed of the outcome of the examination. The chair of the committee will see to it that the proposal defense documentation form is filled out and turned into the assistant to the graduate coordinator following the examination.

2.0 Format Specifications for Proposal Defense Report

Font

Use an Arial, Helvetica, or Calibri typeface, a black font color, and a font size of 11 points or larger. (A Symbol font may be used to insert Greek letters or special characters; the font size requirement still applies.)

Type density, including characters and spaces, must be no more than 15 characters per inch. Type may be no more than six lines per inch.

Page Margins and Formatting

Use *standard paper size (8 ½" x 11)*.

Use one-inch margins (top, bottom, left, and right) for all pages.

Use only a standard, single-column format for the text.

Figures, Graphs, Diagrams, Charts, Tables, Figure Legends, and Footnotes

You may use a smaller type size but it must be readily legible and follow the font typeface requirement. Color can be used in figures; however, all text must be in a black font color, clear and legible.

Grantsmanship

Use English and avoid jargon.

If terms are not universally known, spell out the term the first time it is used and note the appropriate abbreviation in parentheses. The abbreviation may be used thereafter.

Page Limits and Line Spacing

The body of the proposal (i.e., sections A – D) is not to exceed 25 pages, with single-spaced line spacing including all figures and tables.

Reference List

Citations should follow the general format designated for one of the major professional journals in your field. Citations, however, must contain ALL authors (i.e., don't use et al.), title, journal name (using proper journal abbreviation), volume, year, and full page numbers.

Electronic Submission

Proposal should be submitted to your research committee as an MS Word document.

3.0. Guidelines for Sections of Proposal

Research Plan. Begin each text section of the Research Plan with a section header (e.g., Introduction, Specific Aims, Background & Significance, etc).

Section	Instructions
Response to Prior Concerns by Committee	This section is to be only used if the student failed their prior proposal defense and is submitting a revised proposal for a new proposal defense. The introduction may not exceed 1-3 pages and should address the problems raised in the first defense and how these problems have been addressed in the revised proposal.
A. Specific Aims	List the broad, long-term objectives and the goal of the specific research proposed; for example, to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology. One page is recommended.
B. Background and Significance	Briefly sketch the background leading to the present application, critically evaluate existing knowledge, and specifically identify the gaps that the project is intended to fill. State concisely the importance and health relevance of the research described in this application by relating the specific aims to the broad, long-term objectives. If the aims of the application are achieved, state how scientific knowledge or clinical practice will be advanced. Describe the effect of these studies on the concepts, methods, technologies, treatments, services or preventative interventions that drive this field. Two to three pages are recommended.
C. Preliminary Studies	Use this section to provide an account of the preliminary studies that have been conducted by the student that are pertinent to this proposed research Six to eight pages are recommended for the narrative portion of this section. Tables and figures should be liberally used to present the student's preliminary results to support the proposed studies.
D. Research Design and Methods	Describe the research design framework, procedures, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted. Describe any new methodology and its advantage over existing methodologies. Describe any novel concepts, approaches, tools, or technologies for the proposed studies. Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the aims. Provide a tentative sequence or timetable for the project. Point out any procedures, situations, or materials that may be hazardous to personnel and the precautions to be exercised.

Section	Instructions
Protection of Human Subjects *	Institutional Review Board (IRB) approval is required for the use of human subjects in research. If human subjects are to be involved in the proposed research, follow the instructions in NIH PHS Sf424 Version A form, Part II, <i>Supplemental Instructions for Preparing the Human Subjects Section of the Research Plan</i> .
Vertebrate Animals *	<p>If vertebrate animals are involved in this project, address the following five key points. In addition, when research involving vertebrate animals will take place at collaborating site(s) or other performance site(s), provide this information before discussing the five points. Although no specific page limitation applies to this section of the application, be succinct.</p> <ol style="list-style-type: none"> 1. Provide a detailed description of the proposed use of the animals in the work outlined in the Research Design and Methods section. Identify the species, strains, ages, sex, and numbers of animals to be used in the proposed work. 2. Justify the use of animals, the choice of species, and the numbers to be used. A statistical power analysis should be provided to support the number of animals to be used. 3. Provide information on the veterinary care of the animals involved. 4. Describe the procedures for ensuring that discomfort, distress, pain, and injury will be limited to that which is unavoidable in the conduct of scientifically sound research. Describe the use of analgesic, anesthetic, and tranquilizing drugs and/or comfortable restraining devices, where appropriate, to minimize discomfort, distress, pain, and injury. 5. Describe any method of euthanasia to be used and the reasons for its selection. State whether this method is consistent with the recommendations of the Panel on Euthanasia of the American Veterinary Medical Association.
Reference List	The reference list is not included in the 25-page page limit.

*** Additional notes regarding the use of animals or human subjects in research.**

If animals and/or human subjects are to be used in the proposal research, Institutional Animal Care & Use Committee (IACUC) and/or Institutional Review Board (IRB) approval must be obtained prior to performing the proposed studies. If not obtained prior to the proposal defense, the proposal must address plans to obtain IACUC/IRB approval for the proposed research. Passing of the proposal defense does not provide IACUC/IRB approval.