[INSERT TITLE]

By

[INSERT NAME}

Dissertation Proposal
Biomedical Engineering Ph.D. Program
Boise State University
[INSERT DATE]

Supervisory Committee:

[INSERT NAME OF MAJOR ADVISOR / CHAIR]
[INSERT NAME]
[INSERT NAME]
[INSERT NAME – if needed]

PREAMBLE

The purpose of the written proposal is to provide the supervisory committee with the why, how, what, and when of the student's proposed dissertation research. The student needs to convincingly demonstrate that they have identified a significant question/idea in biomedical engineering and have developed a clear and comprehensive scientific approach to address this question/idea. As stated in the Dissertation Proposal Policy for BME, the written proposal must incorporate the following elements:

- **Objective.** Describe the specific aims, objectives and/or hypotheses to be tested.
- **Background and motivation.** A thorough review of relevant literature that includes current state of scientific knowledge in research area and knowledge gap the research will fill.
- **Methods.** A clear and complete description of the proposed methodology to address each hypothesis/objective. Include sample size (and justification), what statistical analyses will be used, and success criteria.
- **Significance and innovation.** Explain the significance of the problem(s) being ad-dressed big-picture impacts of intended outcomes, and innovative aspects of the proposed work.
- **Publications.** List the original research articles that are expected from this proposed research plan. This list must satisfy the program's publication requirement.
- **Timeline.** Visual description of sequence, duration, and milestones for proposed research activities.

This document serves as a guide or template to help students produce a document with all the necessary elements.

Please remove the preamble before disseminating this document to your committee.

ABSTRACT

The abstract is a short, self-contained statement that summarizes your work as a whole (200-word limit). This is not a review of your work, nor is it an excerpted passage from your work; it is an original document that describes what your dissertation proposal is about. This abstract will be included in the flyer created by the BME program to promote your oral proposal.

CHAPTER 1: OBJECTIVE

You can think of the first, introductory chapter as the Specific Aims or Project Summary from an NIH or NSF proposal without the 1-page limit. Here, the goal is to provide the conceptual framework or master plan for the proposed research without lots of detail. A good introductory chapter will include the following information:

- Current scientific knowledge.
- Current gap in scientific knowledge
- Overarching project objective or purpose
- Specific aims and hypotheses (and sub-hypotheses, if necessary) to be tested.

A student could consider presenting each objective / aim as one publication.

CHAPTER 2: BACKGROUND AND MOTIVATION

The second chapter is a thorough review of the relevant literature that provides the current state of scientific knowledge in the research area and the knowledge gap the proposed research will fill.

A good second chapter will provide a comprehensive and critical review of previous work on the research topic, it will discuss relevant methods and findings, and explain the explicit need driving the proposal (e.g. what is the consequence of not addressing).

CHAPTER 3: METHODS

The third chapter should include a clear and complete description of the proposed methodology. This chapter should address each objective or aim/hypothesis, and should include the required sample size and proposed statistical analysis to test each objective/aim.

A good methods chapter should exhibit *scientific rigor* to ensure unbiased and well-controlled experiments, and should provide sufficient detail that a knowledgeable researcher in your field *could replicate* the proposed work. This chapter can be split into subsections to account for the multiple-project nature of doctoral dissertations.

Note: The committee will assume that you will perform all parts of the proposed projects, so you need to be very clear about any parts of the proposed project that will be performed by others.

CHAPTER 4: SIGNFICANCE AND INNOVATION

The fourth chapter of the dissertation proposal describes the proposed research's impact and novelty.

A good significance and innovation chapter will clearly articulate the technical and clinical significance of the problem being addressed (including the big-picture impact of expected outcomes) and innovative aspects of the concepts, methods, instrumentation, or interventions (including whether the work will be transformational in shifting current paradigms).

CHAPTER 5: PUBLICATIONS

Chapter five will clearly list the original research articles that will be created from this proposed research plan. The BME program's publication requirement is a minimum of *three original research articles that the student has written as sole 1st author* and that have been published in peer-reviewed journals (one of these papers can still be in-review at the time of the defense). These original research articles are expected to be full-length, however, it's acceptable for one of these three papers to be a shorter original research article (e.g. technical note, short communication) or patent. A review paper would not count towards the publication quota for graduation, since it does not represent original research conducted by the candidate. Moreover, the papers in the dissertation must not duplicate thesis or dissertation work from *prior* graduate degrees (Masters or Doctoral). The three-publication policy is the minimal requirement for the BME program, however, the student can produce and include more than three publications in their dissertation.

Publication #1:
Title:
Authors:
Journal:
Status (published, in-review, planned):
Project Alignment (what part of proposed research relates to this publication):

<add additional papers using the above format>

CHAPTER 6: TIMELINE

The final chapter should include a timeline that clearly shows the targeted dates for each of the proposed experiments, submission and acceptance of journal articles, and the defense.

REFERENCES

Students need to provide a comprehensive list of references cited in the dissertation proposal. The chosen citation format is at the discretion of the student and major advisor, but should be consistent throughout the document.

APPENDICES

Students can provide additional relevant information in the Appendices. For example, students may wish to include supplementary information, such as research approval forms (IBC or IRB approval), research questionnaires, computer code, additional publications or research products, or preliminary data analysis.