

Biological Engineering Undergraduate Thesis

Thesis Guidelines as of October 2017

be.mit.edu/academic-programs/current-undergraduate/biological-engineering-undergraduate-thesis

Overview and Suggested Milestones

Overall Length	The thesis should be double-spaced and 25-50 pages in length (including figures).	
MILESTONES	<i>Suggested deadline for draft</i>	<i>Notes</i>
Literature review	November	
Full thesis outline	December	Think about... <ul style="list-style-type: none"> • What information would you include in your Introduction? • What figures would you include? What titles would they have? • What subsections would your Results include? What titles would they have?
Introduction, rough draft	December	You are likely to need to revise your Introduction once you have all of your results, which can change your thesis' story. However, it would be helpful to start drafting your Introduction early so that you can start synthesizing relevant literature in your field.
Methods	January	
Figures	February	
Results	March	
Discussion	March	
Introduction, second draft	April	
Abstract	April	
DEPARTMENTAL DEADLINES		
First draft emailed to advisor + BE Comm Lab	April: 3 weeks prior to standard non-PhD thesis due date (check MIT Academic Calendar) Advisor returns comments within 2 weeks.	
Presentation of work	April: e.g., at the BE Undergraduate Symposium	
Final draft emailed to advisor, BE Comm Lab, BE Academic Office	May: by standard non-PhD thesis due date Advisor grades thesis by last day of final exams.	

Style

Choice of style for citations, etc. is left to the student and their advisor, as long as citations are internally consistent.

Suggested Criteria for a Successful Thesis

The following criteria are adapted from the [BE CommKit](#), which you can consult for more support.

Overall WRITING STYLE should be...

1. Concise
2. Clear: simple sentence structure, minimal jargon
3. Quantitative wherever possible
4. Logical and smooth: transition phrases are used to establish logic and narrative flow

A successful ABSTRACT has...

1. **General Background.** Something that everyone in your audience cares about.
2. **Specific Background.** Zoom in from the thing everyone cares about to the thing you did.
3. **Statement of Problem or Knowledge Gap.** What specific problem or phenomenon do we not understand in this field of study?
4. **Here we show.** One sentence about what you learned or did, and how that fulfills the demonstrated gap.
5. **Approach & Results.** Only the very highest-level methodology results.
6. **So what?** What do your results mean for the thing everyone cares about?

A successful INTRODUCTION has...

1. **General Background.** Your research is anchored in a general topic that everyone in your audience cares about.
2. **Specific Background.** All information connects your project with the general topic that everyone cares about. The information accurately represents the field and is correctly referenced.
3. **Statement of Problem or Knowledge Gap.** The question you address is clearly articulated, connected to the background, and appears meaningful.
4. **Here we show...** Your findings and their implications fill the demonstrated gap.

A successful METHODS section...

1. provides the reasons for choosing your methodology
2. allows readers to confirm your findings through replication

A successful RESULTS section...

1. provides substantial evidence in support of conclusions.
2. presents data that are analyzed appropriately (e.g. statistical tests are appropriate) and, where possible, creatively.
3. describes data and conclusions drawn from them clearly and without speculation.
4. presents data in a narrative flow with no logical leaps.
5. creates a narrative that builds to a take-home message.

A successful DISCUSSION...

1. briefly summarizes the main conclusions of the thesis.
2. tells how the thesis' results contribute to answering the big questions posed in the Introduction.
3. explains how (and why) this work agrees or disagrees with other, similar work.
4. explains how the limitations of this study leave the big questions unanswered.
5. tells how extensions of this thesis' results will be useful for answering the big questions.