

QBioS Proposal Guidelines

Georgia Tech Ph.D. Qualifying Exam and Admission to Candidacy

The Georgia Tech Ph.D. Qualifying Exam has two components – Oral and Written. In QBioS, these are satisfied by your proposal. QBioS students should plan to complete their proposals by September 30 of year 3. Later proposals require extenuating circumstances and must be approved by the QBioS Graduate Committee.

Oral Proposal

Please allow 2 hours total when scheduling:

- 45 minutes for your presentation
- Questions from general audience
- Private questions from your committee
- Committee deliberations
- Debriefing with your committee

Lisa Redding can assist in securing a room for in-person proposals if needed.

Written Proposal

NIH R01 format, but shorter: 8–10 pages, plus 2 pages of references – single spaced, font no smaller than 11 point.

- 1 page = specific objectives (goals, aims)
- Background and significance
- Preliminary results
- Proposed work (or preliminary results and proposed work can be combined if results are short)
- How to answer the question? Techniques to use? Methods, data sets, model integration? What does this say about biology? Model data integration?

New as of 2024: Alternately, the written proposal can be the draft of a first (or co-first) author paper of your work done during the Ph.D. so far.

Do your best where you are now. Explain your central question. How is that realized through these aims? What are we going to learn from this? If you are not generating your own data, you need to say who is providing the data.

Procedures

Preliminary meeting with committee – If you already did this in fall 2025 or more recently, you can have individual conversations with committee members if you prefer. Discuss with your advisor.

Develop your proposal

- Georgia Tech sometimes offers Thesis Boot Camps.
- The Naugle Writing and Communication Center offers one-on-one consultations.

Send the written document 2 weeks prior to the oral defense. Collect feedback from all committee members. You can fail once and take it again – you are evaluated on both the oral and written parts.

Advertise through Lisa – the announcement is sent 10 days to 2 weeks before the oral proposal.

This is not going to be perfect. It's a proposal – meant to help you develop a stronger, more compelling vision for your dissertation work in QBioS!

Student Action Items for QBioS Proposal

1. Send your written thesis proposal (10 pages + 2 pages references) to your committee 2 weeks prior to your proposal. CC Lisa so QBioS can keep a copy for its records – past QBioS students have agreed that their proposals can be shared. Ask Lisa for the Dropbox link.
2. Send Lisa Redding a proposal announcement following the example format below, no later than 11 days before your proposal. This is distributed by email to the QBioS student and faculty lists and your home school list. The first announcement goes out 10 days prior to your proposal, with a reminder on the day of. It's recommended that your advisor(s) review your announcement before you submit it.
3. See the [QBioS Proposal Evaluation Rubric](#) (Google Form). The committee decides a pass/fail for your proposal; averages of 3 or above in each component are advised as passing.

The committee should provide feedback immediately after your proposal, and Lisa can share your submitted assessment forms.

4. If you pass your proposal, your committee should sign the Admission to Candidacy document for Georgia Tech. This form is submitted by DocuSign and can be found on the [Georgia Tech Theses and Dissertations Forms page](#).
5. Since you will be communicating with your committee during the proposal, this is also a good time to prepare and get signatures on any pending documents, such as your [Program of Study \(QBioS my-QBioS page\)](#) and your [Doctoral Minor form \(Theses and Dissertations Forms page\)](#).

Example Proposal Announcement



Quantitative Biosciences Thesis Proposal

Student name

Student home school

Proposal Title

Monday, September --, 2026, at 12:00 pm

In-Person Location: Howey N201/202

Meeting Link: *If using Zoom, have your advisor create this to ensure a duration longer than 40 minutes.*

Open to the Community

Advisor:

Dr. Peter Yunker (School of Physics)

Committee Members:

Dr. Sam Brown (School of Biological Sciences)

Dr. Jennifer Curtis (School of Physics)

Dr. Brian Hammer (School of Biological Sciences)

Abstract:

Bacterial colonies are a main area of focus in biomedical and ecological research, being sources of infection and accounting for a large percentage of biomass on Earth. Given their three-dimensional structure, complex material properties, and social behavior, fast and accurate measurements remain elusive. Akin to how geologists study mountains and Earth's topography to learn about the history of Earth, we postulate that the same methodology can be applied to

bacterial colonies. Their topographies are rarely quantitatively characterized; these topographies reflect not only the current configuration of the colony but may also reflect some of its history.

We explore how interferometry, a measurement technique capable of measuring the surface topography of an unprepared sample with ultra-high resolution, can allow us to understand the development of surface-attached microbial colonies. We aim to link the theory developed for inert crystal surfaces with the complex self-assembling interface of biofilms. Previous work has already shown the utility of measuring topographies to identify bacterial warfare and antibiotic heteroresistance. Using time-lapse interferometry, we can get large datasets of developing samples from single cells to large ~1 mm tall colonies.

To establish interferometry as a tool for microbiology, we need to develop a framework that not only allows a streamlined analysis of the samples but also lets us learn biologically relevant quantities, such as growth and death rates, species identification, and age of the sample. For this purpose, we propose an approach of experimental measurements complemented by simple biophysical models and spatial computational simulations.

QBioS Handbook – Qualifying Exam

D.3.1 Written Thesis Proposal

By the end of the second summer at Georgia Tech, every QBioS Ph.D. student must seek admission to candidacy by presenting a 10-page proposal, including 2 additional pages of references, to a Thesis Proposal Committee (TPC) composed of their primary research supervisor and 3 other faculty members. Of these 3, at least one must be from the QBioS program faculty. The written proposal may be in the format of a grant proposal based on the student's Ph.D. research, or it may be the draft of a first (or co-first) author paper of their work done during their Ph.D. so far.

D.3.2 Oral Defense of Proposal

Every student is required to defend their written thesis proposal to their TPC in the form of a 45-minute oral presentation, followed by brief questions from the public, followed by an additional 30–60 minutes of questions from the committee. The oral defense should take place no later than September 30 following the second year of study. Each TPC member (except the supervisor) is expected to ask questions designed to probe the student's understanding of their proposed research. It is the responsibility of the TPC to decide if the student “passes” or “fails” the thesis proposal – judged comprehensively based on the quality of the written and oral components. A student who passes is formally admitted to Ph.D. candidacy.

D.3.3 Procedures for Re-examination of the Proposal

A student who fails must rewrite their thesis proposal and/or repeat the oral presentation as directed by their TPC. The re-examination must occur no later than the semester subsequent to

the initial exam. A student who fails their examination twice will be removed from the Ph.D. program but can choose to “master out” through timely completion of an M.S. degree in their home school, typically in the same or next semester.

Proposal Assessment Form Content

The proposal is assessed using the [QBioS Proposal Evaluation Rubric](#) (Google Form). Each committee member rates the student from 1 (lowest) to 5 on the criteria below and provides required written comments.

QBioS Technical Writing Assessment

Technical writing assessment criteria, rated 1 (lowest) to 5

Criterion	1	2	3	4	5
Overall Writing Effectiveness – focus, style, and clarity of communication					
All figures and tables are effectively interpreted and discussed					
An adequate number of references are used and cited appropriately					
Research plan is logical and coherent, including timeline, resources, rationale					

Required: comments on the student's technical writing.

QBioS Oral Presentation Assessment

Oral presentation assessment criteria, rated 1 (lowest) to 5

Criterion	1	2	3	4	5
Communicating Science – focus, style, and content; communicated clearly and effectively					
Figures and tables are effectively interpreted and discussed					
Evaluate the quality of preliminary research results					
Research plan is logical and coherent, including timeline, resources, rationale					

Required: comments on the student's oral presentation.

QBioS Research Assessment

Research assessment criteria, rated 1 (lowest) to 5

Criterion	1	2	3	4	5
Originality					
Knowledge of the Discipline					
Contribution to the Discipline					
Quantitative Modeling in the Biosciences					

Required: comments on the student's research.

Georgia Tech Quantitative Biosciences (QBioS) · Remediated for digital accessibility (WCAG 2.1 AA / Title II) · Source: QBioS Proposal Guidelines and Admission to Candidacy