

The Research Qual

The Research Qual's objective is for graduate students to produce a scientific manuscript and present their findings to the Department by the end of their third year in the Ph.D. program

Motivations for a research-based qual

- To emphasize research during the first few years in our graduate program. Success of our students in academic career paths is shaped largely by their success at conducting, writing, and presenting their research. The research productivity of our students affects our competitiveness at recruiting students, the average time to graduation, and whether our students are offered the most desirable postdoctoral fellowships.
- To provide graduate students with feedback on their research from faculty members other than their advisor.
- The experience of writing a scientific document and presenting their research helps to impart an understanding of the flavor of modern scientific research and of what is required to complete the Astronomy Ph.D.
- Students are required to understand the scope of their chosen field of study early on.
- The Oral Qual presentations provide a forum to introduce department members to the research of graduate students well before they graduate, enhancing departmental communication and cohesiveness.

Overview of Research Qual: Twice every academic year, *once the last Friday before the Thanksgiving Holiday break and once on the second Friday in May* (modulo some flexibility in both to accommodate religious holidays), there will be a “Qual Day”. The specific dates will be announced well in advance, and the faculty are expected to attend. Early graduate students, who have not yet qualified for Ph.D. candidacy, present 30 minute (+10 min for questions) research talks to the entire department. The “Qual Day” presentations will each summarize the goals, broad scope, and the results of a project undertaken (initialized and advised) with a UW advisor, with students required to pass the Qual by the fall of their fourth year. Students will present on Qual Day once they have submitted a 5-10 page writeup of their research project that is approved by a Qual Committee. Passing the Qual is a required step in the Ph.D. program (although there is no formal promotion step associated with passing). The Qual should not be thought of as a traditional test but rather a hands-on learning process that trains students in the skills of research. Students are expected to reach a specified level of aptitude in this process by the fourth year in the program.

1 Written component

Each student who aims to qualify must submit a 5 - 10 page (if their document was formatted for ApJ) scientific journal-quality write-up of their research project by one month prior to “Qual Day”. This does not have to be a finished research paper, but it must describe original research carried out during the student's time at the UW that will comprise a substantial fraction of one. The written draft should be primarily the student's work. Each student's advisor and collaborators can help with the described analysis and even the writing (as they would with a research paper), but the student must detail what work they are responsible for in a cover letter.

mentoring squad: Prior to submitting the written qual, each student’s mentoring squad must be given a draft of the students written qual (at least ~ 1 month prior to submission to the committee). The mentoring squad should provide comments on the draft. The major comments of the mentoring squad (~ 1 page) must be passed to the Qual Committee along with student responses for how the comments were addressed in the submission. These comments should also allow the Qual Committee to make a more informed assessment.

evaluation by Qual Committee: The Qual Committee should receive the written document one month in advance, including a cover letter detailing work and the correspondence between the mentoring squad and student. Two faculty members on the Qual Committee will be assigned to be the primary and secondary reviewers and they will make recommendations to the full committee. The full committee will come to a decision and inform the student after two weeks. In addition to an assessment of whether the submission passes, the committee will also provide feedback that can be used for the oral presentation, future quals, and in making the document into an academic publication.

For borderline cases involving students near the end of their ‘Qual Clock’, the Qual Committee has the option to give the student one week to fix aspects of the draft and still present in the current qual cycle. In such cases, the Qual Committee will evaluate the resubmission within 2 days, leaving 5 days to prepare the qual presentation.

Each student’s written qual will not be judged on the interesting-ness of the results, but rather on the rigor of the investigation into the topic. The write-up *must* include a short abstract, a referenced introduction to the topic of study, and a polished summary of the work the student has completed. The write-up does not require a complete or finalized conclusions section, although if incomplete it should conclude with a short discussion detailing the steps remaining to make the write-up into an academic publication (or this could alternatively be in the cover letter).

To pass, the Qual Committee must judge the written Qual to satisfy all of the following:

- The manuscript must describe original work, making clear how it adds to the current understanding.
- The analysis must be rigorous (the statistical significance of quantities assessed; the robustness/convergence of results tested).
- The level of referencing must be on par with publications in its field. The introduction must place the work in context by describing relevant previous studies.
- The plots must be publication quality and incorporated into the paper narrative.

A paper being accepted for publication in one of the standard peer reviewed journals does not guarantee passing, although this will be taken under consideration.

2 Oral component

If a student receives a passing grade on the written component, they will be scheduled for a 30 minute presentation (+10 min for questions) during Qual Day. The presentation should discuss the context of the student’s work as well as the original research that was conducted. All questioning for the oral component will be public. The Qual Committee will provide a passing or failing grade to each student for the presentation. The evaluation of the Qual Committee will be presented to the student in a follow-up private meeting between the committee and the student. Only “pass” or “fail” will be communicated to the faculty as a whole.

3 Summary of the Qual's place in degree sequence

If students pass 7 of the 8 core classes under the Graduate School's stipulations (minimum 2.7 per class, with minimum average 3.0 GPA), then they receive a master's degree. This will also trigger a pay raise. To continue to qualify for a PhD, students must pass the Research Qual and show mastery in the core classes. In particular, students must pass the Research Qual before taking their General Exam; however, students may take the General Exam before completing all the core classes. Students must pass the Qual by the November Qual of their fourth year. Allowing 3+ years to pass gives the students more flexibility to change projects midcourse. The Qual project does NOT have to be related to the student's PhD project.

The requirement to finish the Qual by the start of fourth year can be deferred to a later date for health or other non-academic reasons with approval from the graduate student coordinator.

4 Qual Committee

The Qual Committee will be four Astronomy Department faculty, with the eventual aim of rolling membership (with two faculty added per year) to maintain continuity. Two faculty members will be the primary and secondary evaluators on each student's qual and everyone on the committee (excluding the student's advisor if they are on the committee) should take part in the final assessment, building off the Primary and Secondary's assessment.

The job of monitoring student progress falls on the mentoring squad with oversight from the graduate student coordinator. The Qual Committee is not involved in monitoring progress. Instead, the committee is also charged with announcing the Qual dates and deadlines, and should keep tabs on who is planning to take the Quals and when (and the dates individuals need to pass the Qual by).