

**IOWA STATE UNIVERSITY DEPARTMENT OF PHYSICS AND ASTRONOMY**  
**RULES GOVERNING THE QUALIFYING EXAMINATION**

Approved by the Faculty 24 March 2004; Amended 29 August 2006,  
Amended 10 May 2010, Amended 16 September 2015, Amended 19 October 2015,  
Amended 19 April 2016, Amended 22 February 2019

1. The Qualifying Examination will consist of two parts, one covering essentially classical physics topics and the other covering essentially modern physics topics. A statement of the purpose of the examination as well as a detailed description of the character, level, and areas of coverage of the examination will be made available to students well in advance of the time at which it is offered. Each part of the exam may be passed independently of the other. The Modern part of the Exam will be administered each year in January before the start of the Spring semester, the Classical part of the Exam will be administered each year in August before the start of the Fall semester. The GSC will appoint a Qualifying Examination Committee and a chair of that committee for each parts of the exam. The committee will prepare, administer, and grade their respective part of the Qualifying Examination. Additionally, the GSC will appoint an Inspector General whose responsibility is to ensure that the examination adheres to the detailed description previously made available to students. The Inspector General will review the exam to ensure that the types of problems and difficulty level is consistent with previous exams. Inspector General will also review the exam scores prior to sharing them with faculty in order to ensure that grading was consistent with established practice. The Qualifying Examination Committee members will be notified of their appointment by the Department Chair.
  
2. After completing two semesters of graduate study in Physics and Astronomy at ISU, excluding summer session, a student must pass both parts of the Qualifying Examination within the next two offerings in order to proceed toward a Ph.D. Furthermore, students in this category are required either to take the portion of the examination they have not yet passed or to declare in writing their intention to terminate graduate study in Physics and Astronomy at ISU with a Master's Degree. Such a declaration may later be withdrawn only by permission of the GSC. Students who enter ISU with M.Sc. degree from another institution must pass both parts of the Qualifying Examination as outlined above. Students who passed the Qualifying Exam on 0th attempt can have the course requirements reduced for equivalent graduate classes they completed at previous institution. In highly unusual circumstances, a student may petition the GSC for an exception to the above rules. The GSC action will be reported to the faculty.
  
3. Each committee will grade its corresponding part of the examination independently and without consulting with the other committee. Each problem will be graded independently by at least two members of the committee. Students will be identified only by the rank-order number of their score and the information correlating this number with a student's name will be known only to the respective Qualifying Examination Committee chairs until after the whole faculty accepts the committee results (see Section 4). The committee will then agree to a minimum passing score for that part of the examination. The Qualifying Examination committee chair will summarize the results as follows:
  - a) Every student will be assigned an identification code for each portion of the exam in any manner deemed appropriate by the Qualifying Exam Committee chair. The identification code for each student will be different for each of the classical and modern portions of the Qualifying Examination. The information correlating this code in any way with the student's name will be retained only by the Qualifying Examination Committee chair.
  - b) For each part of the exam a table will be prepared listing the students taking the exam rank-ordered by score and identified only by the assigned identification code for that

exam. Lines will be drawn on the table to indicate the average score and the committee-recommended minimum passing score for the examination.

4. The materials for the Faculty meeting discussing the results of the Qualifying Exam (coded score table, proposed passing scores etc) will be shared with faculty at least 24 hours before the meeting to provide sufficient time for analysis and allow faculty to make informed decision about approving the results.
5. The Qualifying Examination Committee chair for each part of the exam will preside over a meeting of the Physics and Astronomy faculty and will present to the faculty the examination results in the form of the final tables and the prepared summaries. The faculty may not, except by a two-thirds vote, alter the decision of the Qualifying Examination committee. Individual student's names will not be associated with their identification numbers until the minimum passing score for each exam is completely and finally established by the faculty and the determination of which students have passed each part of the exam has been made. A summary of the individual results for each student taking the exam and their academic record will then be presented to the faculty.
6. The following provisions are made for dealing with very unusual cases. After the identity of each student taking the examination has been revealed, any faculty member may request special study of a case in which (a) the student has failed the examination and will not be allowed to proceed further toward the Ph.D. in the Department of Physics and Astronomy at Iowa State, and (b) it appears that this result is clearly at odds with the rest of the student's record. If such a motion is made and seconded, the faculty will discuss the matter and vote on the question of whether the case should be referred to the GSC for study. A simple majority of those present will suffice to approve that motion. No further action shall be taken until the GSC has reported its study and recommendation to the faculty. The case will not be referred to the GSC unless all of the following conditions are satisfied:
  - a) The student must have passed one part of the exam.
  - b) The student's course grades are very good (e.g. a GPA of about 3.5 or better).
  - c) The student shows evidence of strong research performance.

In addition, any student may petition the GSC to have their case reviewed. The above conditions apply for a petition to be considered. In addition, a letter from the student and the advisor is required that explains the reasons for the petition and any mitigating circumstances that would warrant an additional attempt at the qualifying exam. In order to rule favorably on the petition the GSC must find that there are circumstances beyond the student's control that affected their performance and that there is a high probability of success if the petition is granted. After review the GSC may recommend one of the following:

- a) The student is not allowed to proceed further towards a Ph.D. in the Department of Physics and Astronomy;
- b) The student be given an additional opportunity to take the portion of the Qualifying Examination they have not yet passed.

These recommendations do not require departmental ratification. In all cases the guiding principle is that the student must amply demonstrate knowledge of both classical and modern physics at the level of the qualifying examination before being allowed to proceed further towards a Ph.D.

7. The Qualifying Examination Committee will publish solutions to the examination. Examination papers will be returned to the students with no marks on the paper. The tables for each exam will

be made available to the advisors of students who fail the examination. This will be accomplished as soon as possible and no later than the Friday of the second week of the Fall Semester for the Classical portion of the exam and no later than the Friday of the second week of the Spring semester for the Modern part. The advisor may indicate to the student only the position of his or her identification number in the tables.

8. The faculty may amend these rules by a 2/3 vote.