Graduate Preliminary Exam: Physics Department

Logistics:

1. **Timing:** The preliminary exam (prelims) will be held twice a year, roughly during the following two periods
   - ⋆ Spring: 6 weeks into the spring quarter (SQ)
   - ⋆ Fall: a week before start of the quarter

   The spring exam will be scheduled to avoid conflicts with TA assignment (possibilities include consecutive Saturdays or a Fri/Sat combination). The graduate curriculum for SQ Y1 has a reduced number of core courses to allow for adequate study/preparation time for the students.

2. **Exam structure:** Each exam will have 10 questions (2 each in classical mechanics, quantum mechanics, statistical mechanics, electromagnetism, and modern and classical physics with emphasis on seminal experiments and techniques) and takes place over 2 days. Each day the students will have 4 hours to solve 5 questions. Questions will be restricted to undergraduate level material (students will be provided with a list of topics) and should be workable in 15 minutes by a student with a thorough knowledge of the topic.

3. **Formula sheet:** Students will be allowed to bring in a single 2-sided (US letter or A4 sized) sheet of paper with formulae they feel relevant for the exam.

4. **Administration**: The preliminary exam committee will solicit questions from faculty for each edition, but will be ultimately responsible for crafting the exam in its entirely.

5. **Grading**: The questions will be graded by either the members of the prelim committee or the person proposing the question. The grading shall be done with a detailed breakdown of point assignment for each question with appropriate partial credit reasonably documented by the grader.

Pass criteria:

- The students will have at most 4 tries for the prelim exam. Students will be encouraged to take the exam on entry (FQ Y1) at the very least for calibration, followed by 3 further attempts, during SQ Y1, FQ Y2, and SQ Y2, respectively.

- Scores for the prelims will be scrutinized by a faculty committee which will determine a pass line. Individual questions will be graded with 50% considered the minimum acceptable level. The overall pass line should be at least 50% and may be higher and shall be determined for the entire exam. Previous pass lines will be posted, once they are available, to help students gauge their preparation. The exam will be considered for pass/fail in its entirety.

- The following protocol is expected to be followed in case students do not meet the pass threshold proposed by the faculty committee:
  - ⋆ For the FQ Y1 and SQ Y1 editions students not meeting the pass threshold will be asked to take the exam when next administered. Student advisors will be alerted to help advise on preparation for the exam.
  - ⋆ Students who fail to meet the cut-off in FQ Y2 will be discussed by the aforementioned faculty committee who will examine the students' performance and consider if alternative

pathways for satisfying requirements are appropriate. In most occasions we anticipate the students would be asked to take the exam in SQ Y2.

- ⋆ Should the student fare poorly on all four tries, a faculty committee will decide if there is a case for an alternate arrangement, and, if so, propose to the physics graduate group faculty such an arrangement for the student to satisfy degree requirements. In general, no faculty-wide discussion will take place until the student has attempted the exam all the four possible times.

- There will be a-priori no correlation between the evaluation of performance on the prelim and progress on the research front until SQ Y2, except in highly unusual circumstances.

- The graduate preliminary exam will also be used as a comprehensive exam for the MS degree. The pass score for Master's students will be set to approximately 5 percentage points below the threshold for the PhD students.

- Requests for exceptions and appeals of the prelim results will be examined by a faculty committee, who will bring a recommendation to the full faculty.