

This document analyzes the UA Physics Undergrad GRE survey given in Spring 2010. There were 18 respondents. First the raw data is presented. Interpretation of this data follows.

The fraction of students responding who took the Physics GRE exam in Fall 2009 or Spring 2010 was 55.6%. The Physics GRE scores of these students are shown in Figure 1.

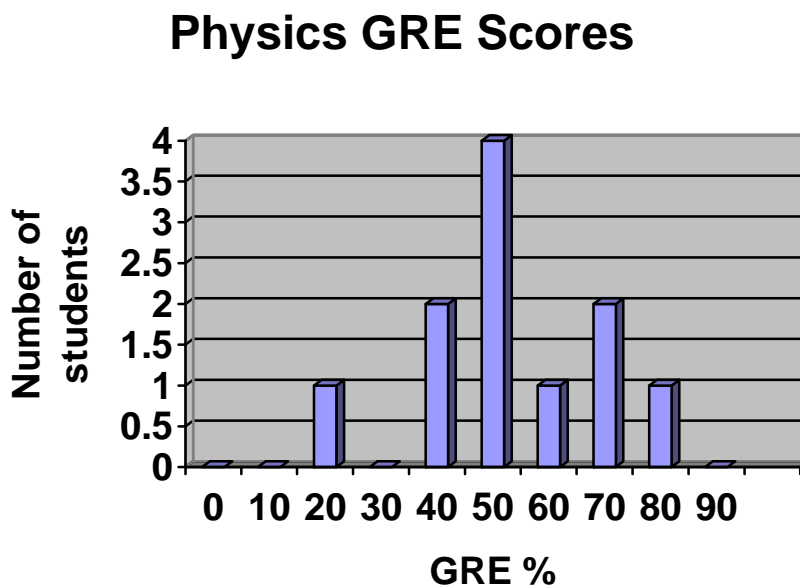


Figure 1 Table of Physics GRE scores from responding undergraduate physics majors.

Next, students were asked how well their undergraduate courses prepared them for the Physics GRE exam questions on mechanics, electricity and magnetism (E&M), quantum mechanics (QM), and thermodynamics. Their possible response choices were extremely helpful, very helpful, moderately helpful, slightly helpful, and not helpful. Note the Physics Department courses are currently not taught with the Physics GRE exam in mind.

For mechanics, the student percentages for ratings from extremely helpful to not helpful were 9%, 27%, 55%, 9%, and 0%.

For E&M, the student percentages for ratings from extremely helpful to not helpful were 27%, 18%, 46%, 9%, and 0%.

For QM, the student percentages for ratings from extremely helpful to not helpful were 46%, 27%, 18%, 9%, and 0%.

For thermodynamics, the student percentages for ratings from extremely helpful to not helpful were 9%, 36.5%, 18%, 36.5%, and 0%.

The graduate schools to which 10/11 students were likely to attend were: UA (University of Arizona) Professional Science Masters (PSM) program, ASU, Caltech, UC Davis, Colorado State University, University of Colorado, Harvard, University of Minnesota, Northern Illinois University, and University of Washington.

Of the 44.4% of students who did not take the Physics GRE exam, their future job acceptances included working at a national lab, air force pilot, physics engineer, accelerator operator, and a research position at Steward Observatory. At least one indicated they would eventually like to attend graduate school.

Comments on the relationship between UA Physics courses and the Physics GRE were:

*"I took the October 2008 GRE test. It would help to make sure students are aware of the Physics GRE early on, and that they know to spend more than the several weeks before the test to study for it. It seems like some students think they can stroll in and get a 50% no problem...until they take a practice test (and by then it's almost too late)."*

*"It'd be great if the UA offered a Physics GRE prep course. The GRE is considerably different than the materials and methods taught in classes."*

*"Dr. Milsom made me learn things"*

*"Dr. Garcia's GRE class was very helpful. Moreover, the GRE has become such a big deal in the US, there should be a much greater focus in the undergraduate course curriculum to prepare the students for the GRE - this implies new test questions/sections with GRE format! Thanks UA."*

*"I had not taken thermodynamics before taking the GRE (I am taking it now), but had I done so, the above score would likely have been higher. I put "slightly helpful" for the other three, because the courses in the physics program here focus mostly on derivations, not much on example problems. I found that knowing derivations was entirely useless to me on the GRE, but studying example problems helped out a great deal."*

Finally, comments on the relationship between UA Physics courses and ongoing job searches were:

*"The upper division lab courses have given me experiences that I probably would have not gotten until I got the job."*

*"The aforementioned job is a continuation of my current part-time research work. I plan on doing at least a year of research, and possibly attending the UofA part time as a non-degree seeking graduate student in order to strengthen my (currently pathetic) application to a PhD program. I also plan on retaking the physics GRE, now that I know exactly what to expect and how to prepare."*

Some observations and conclusions are:

61% of the respondents were planning on advanced degrees in Physics and 90% of these were accepted into some advanced degree program. This means we are successful in preparing those students who desire to attend graduate school in physics. Two of the graduate programs selected by students were Harvard and Caltech, which admit the top students in the country. The remaining graduate programs with one or two exceptions are UA peers, more or less.

The approximate Physics GRE score cut off for acceptance into the graduate Ph.D. program at the University of Arizona is 50%. Over 70% of the UA physics majors would pass this criteria and another 20% received GRE scores between 40 and 49%. This is a positive sign especially considering that the Physics Department junior level courses do not specifically teach to the GRE exam.

A better effort by the Physics Department to make the students more aware of the exam dates and the preparation time and effort needed to excel in the exam would likely improve the scores of UA physics majors.

The best Physics Department course for GRE Physics exam preparation was quantum mechanics. The worst was thermodynamics. Perhaps a comparison of the thermodynamics course syllabus and the GRE Physics exam thermodynamics questions might explain the latter.

The job description data collected was inadequate. The question should be revised to ask for company names and job titles in the future. Perhaps two questions should be asked relating to successes in job searches with B.S. Physics degree from UA.