

Assessment Plan for BS in Astronomy & Astrophysics

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Department of Astronomy

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Assessment Plan for Year 1 (2015):

We will assess our program goal #3, that students will be aware of and show mastery of various modes of scientific thinking employed by astronomers in conducting astronomical research. We will focus our efforts on the specific learning outcome #3.a, that students will demonstrate quantitative problem solving skills in an astronomical context, which is a common goal across the curriculum.

Our goal in the assessment of this learning outcome is to learn whether we are building appropriate scaffolding for this important skill from our introductory courses at the 200-level to our advanced courses at the 400-level. While we will not be able to complete this task within the first year due to the small number of majors in these courses, the data collected during 2015 will form the basis for a longitudinal assessment of our BS degree program.

The planned assessment process will provide brief snapshots of students' quantitative reasoning skills at different levels of our degree program by evaluating the competencies of students enrolled in 200-, 300-, and 400-level astronomy courses each year, excluding the research and reading courses. In particular, as we expect students to build their quantitative reasoning skills through the synergistic relationships between the astronomy courses they take and the other courses required for the major, the data collected in the astronomy courses will be representative of students' achievement in the degree program as a whole.

We will assess the students' ability to solve quantitative problems based on student work collected as in-class activities, homework assignments, and/or exams in the 200-, 300-, and 400-level astronomy courses. Instructors will select 3 representative problems to be scored to indicate whether the student's problem solving skills are effective, acceptable, or need improvement at the level appropriate for the course (basic in A221; intermediate in A222; advanced in the 300- and 400-level courses). Instructors will submit a report detailing the questions used in the assessment process and the summary tally of the evaluated student competencies to the individual charged with tracking the Department's assessment program. Due to the small number of majors in these courses, the results will be aggregated over three years before being reported outside of the Department.

We expect that at least 60% of the students in these courses will be able to demonstrate either acceptable or effective quantitative reasoning skills at the level appropriate for the course and in the judgment of the instructor.

Assessment Plan for years 2-5 (2016-2019)

We will continue to collect data in the 200-, 300-, and 400-level astronomy courses regarding the specific learning outcome that students will demonstrate quantitative problem solving skills in an astronomical context. As a small program with only a handful of courses within which to collect data, it will take several years to have a sufficiently large, statistically representative, sample to evaluate the effectiveness of our curriculum at achieving this goal for graduating Astronomy & Astrophysics majors. For context, averaging over the graduating classes from just the past 3 years (2012-2014) would still only yield a sample size of 20. Thus, to preserve student anonymity, we do not expect to evaluate the degree program on an annual basis. Rather, we will examine the time-averaged data every several years to determine if our curriculum is achieving our goals, or if we should implement changes.