

# Unit Plan for Assessing and Improving Student Learning in Degree Programs

Unit: Astronomy

Unit Head approval: You-Hua Chu, Chair

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## SECTION 1: PAST ASSESSMENT RESULTS

The Astronomy Department Assessment Plan from 2000 was not followed. Shortly after submission of the proposed plan, there was a significant turnover in department governance and the plan was never implemented.

## SECTION 2: REVISED ASSESSMENT PLAN

- a. Process: We have based our Outcomes Assessment Plan on the plan submitted in 2000. We feel that it was a good idea, but since it was never implemented, it never had a chance to be tried.
- b. Student Outcomes: The Astronomy Department has the following expectations and goals for the graduates from our undergraduate programs:
  - A. A thorough knowledge of the basic principles of astronomy, including cosmology, galaxies and galactic structure, the interstellar medium, star formation, stellar structure and evolution, observational and computational techniques.
  - B. A thorough knowledge of the essential cognitive areas of mathematics and physics.
  - C. The ability to read, evaluate and interpret numerical, astronomical, astrophysical and general scientific information.
  - D. The ability to communicate effectively both verbally and in writing.
  - E. The ability to plan observational programs, use astronomical telescopes and instrumentation, and to process astronomical observational data.
  - F. The opportunity to pursue an individualized research experience as an undergraduate.
  - G. The expectation that students will be broadly educated in areas outside of science.
  - H. The opportunity to acquire the knowledge and skills needed to succeed in the workplace or in professional school after graduation.

For graduate students, all of the above undergraduate expectations and goals apply (at a higher level of expectation), with the following addition:

- I. The ability to conceive, plan, carry out, and publish original and significant research in an area of astronomy and astrophysics.
- c. Measures and Methods Used to Measure Outcomes: The Astronomy Department at UIUC plans to evaluate the success of the outcomes it has set forth for its graduates in the following ways:
  - A. Using existing survey instruments:

- i. ICES Evaluations (goals A-E)
  - ii. Chancellor's Senior Survey on the Undergraduate Experience (goals A-H)
- B. Conducting on-going interviews of majors throughout their undergraduate careers and after graduation (goals A-H). The Astronomy Department is relatively small, with a ratio of undergraduate majors to faculty of less than five. This permits a much more personal method of helping our majors achieve our goals for the major and of assessing our success. Each entering class is assigned to a single faculty member as advisor; this same person remains each student's advisor throughout his/her undergraduate career. The Astronomy Department requires that each major meets with his/her advisor during the registration period for the next semester's classes (enforced by placing a hold on each student's on-line registration that can only be lifted by the advisor). During these twice yearly meetings, faculty come to know each student personally and to learn how each student is progressing in meeting our Department's goals for a quality undergraduate education. Faculty encourage students to keep in touch after graduation and to inform us of their progress in their immediate career or in their further (graduate) education and eventually in their career. Because of our Department's having a small student/faculty ratio, we feel that our more personal approach to assessment (compared with formal surveys) is a tremendous advantage in assessing the effectiveness of our program.

### **SECTION 3 : PLANS FOR USING RESULTS**

- a. Plans:
  - A. Semester reports from academic advisors. In the past the Astronomy Department has not collected a formal report from advisors. We will require a formal report each semester from each advisor, addressed to the Department Chair. The Chair will produce an annual report incorporating the results from these reports and from the survey instruments for review by the Department. As appropriate, this annual report will include action items for addressing any deficiencies that may be uncovered.
  - B. Updating courses and requirements. To allow our students to better achieve the Learning Outcomes listed above, we are in the process of revamping our programs in Astronomy. We detail the pending and planned changes below:
    - i. Pending undergraduate curriculum changes:
      - 1. Making ASTR 210 required for all Astronomy majors - enhances Student Learning Outcome A, ensuring a good foundation of basic Astronomy knowledge.
      - 2. Requiring 3 out of 4 advanced Astronomy "cafeteria" courses (ASTR 404/405/406/414) - addresses Student Learning Outcomes A & C.

- ii. New courses: We are developing new astronomical lab courses in conjunction with a remodeling of the Campus Observatory to create a new Astronomy/Astrochemistry teaching laboratory. These courses will enhance Student Learning Outcomes E & F.

b. Timeline for Implementation:

- A. Advisor reporting requirements will be implemented in the 2008-2009 academic year.
- B. Undergraduate curriculum changes are pending approval by Provost, Senate, and Board of Trustees. We anticipate approval for Fall 2008.
- C. New Astronomy lab courses will begin to be offered in Fall 2009.