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ASTRONOMY AS AN ELECTIVE COURSE: STUDENT EVALUATION

No single evaluation method is accurate for every student. For this reason, you should consider using a variety of methods of evaluation. Possibilities include homework, quizzes, tests, laboratory or classroom exercises, group activities, written assignments, and projects. You may also choose to require attendance and therefore have it contribute to a student's final grade. Whatever your policies regarding grading, make sure that they are clearly stated in the syllabus and applied fairly and consistently. Remember also that evaluations not only help you assign grades to students, they also help you keep your finger on the pulse of a class. For both the students' sake and your own, don't wait until midterm to give students feedback in the form of a grade. If the class averages for the first few quizzes are extremely low, then you know you are not getting across to students and can determine what needs to be changed. There are many ways to encourage and motivate students to keep up with class. Homework and quizzes are two of the most common methods. Each chapter in the textbook [1] includes 20 conceptual self-test questions, 20 review and discussion questions and 15 numerical problems. Subsets of these can be assigned for homework. The problems range from fairly simple to quite complicated; use those that are appropriate for the level of your students. Homework may be collected weekly or the assignments may be retained by each student and kept as part of an assignment notebook or portfolio. The assignment notebook may be handed in on test day and quickly reviewed and assigned a grade or simply a check mark for completion. You could even give points for such things as neatness and cover art. The students usually appreciate having some type of "souvenir" of their work and the assignment notebook is an excellent way to provide that.

Quizzes provide another way to encourage students to stay engaged and caught up. A relatively simple and short quiz given at the beginning of class on the due date of a homework assignment serves two purposes. It is an incentive for the students to complete the assignment on time and it is a way for you to regularly take the class's "pulse". Quizzes also provide the opportunity to ask the students questions about the previous class meeting (which encourages them to look over their notes) or questions about the material to be covered that day (which encourages them to read the material before coming to class). Alternatively, use technology and give a quiz via computer that must be completed before class. The in-class quiz can also be used as an attendance

check and as an incentive to get to class on time; the Web quiz allows you more class time for new material. A short quiz given at the end of a class period is yet another option; it can be used to assess student understanding of the day's material and as an attendance check.

Class size will probably have some influence on the format of your tests. Very large classes usually dictate the necessity of multiple-choice and other objective-question tests. For smaller classes, you may opt to include some discussion or essay questions. Since visual images are an important part of an astronomy class, consider including some identification or other questions based on images. You can attach diagrams or photos to the test itself, but you will find that the students enjoy seeing slides or transparencies displayed at the front of the room during the test. It seems to help reduce anxiety. For a semester course, two or three tests instead of a single midterm are usually the most effective.

Many universities are emphasizing “writing across the curriculum,” so we have included a set of student writing questions in each chapter of the manual [1], which provide an opportunity for student writing in the sciences. You can select one or more of these questions as a writing assignment or you can let the students select them for you. Also, you are certainly welcome to make up your own to tie in with class discussions or personal interests. The questions are intended to stimulate creativity, imagination, and critical thinking. Avoid assigning questions that require students to repeat what they have just read or that may have canned answers found on the internet. Another way to “mix it up” is to assign small-group or individual projects. These can be wonderful and challenging experiences for students in this type of astronomy course. Observing projects can range from one-night to semester-long assignments. Examples include tracking the motion of a planet with respect to the background stars, plotting the position of sunrise or sunset against fixed objects on the horizon, drawing the moon's phases, plotting the motions of the moons of Jupiter, observing and sketching astronomical objects, and following the motion of the Sun by measuring daily shadow lengths. Non-observing projects are also possible. For instance, throughout the course models are very useful for illustrating various concepts. Small groups of students can be assigned different modeling projects to design and construct. Possibilities include models of the solar system, the interior of the Earth, the layers of the jovian planets, the Milky Way, the Local Group, etc.

Exactly how you determine final grades will depend on your personal preference, whether or not the course has a laboratory component, and institutional culture. In particular, check to see if there are expectations regarding what percentage of the final grade is determined by the final exam. Most campus departments require some type of course master to be on file.

Refer to this document (ask your department chairperson) to be sure that you are including all of the required material expected for whatever level course you are teaching. At the very minimum, be sure to include everything advertised for the course in the college bulletin or catalogue.

Whatever evaluation methods you choose, be sure to set up a point schedule where a known number of points are assigned for a given amount of work. Avoid the possibility of assigning points in any kind of subjective way. If the points are awarded purely objectively, then you will not have many arguments concerning grades and if you do, you will be able to provide a solid argument for how points were derived and totaled. You can maintain a certain amount of flexibility by including it in your grading scheme. Such things as dropping the lowest quiz or homework assignment or even test helps to reduce anxiety as well as provides some flexibility concerning absences. If you allow the students to drop something, then you will feel much less guilty about not allowing make-ups, etc.

You might want to consider using an electronic spreadsheet such as Microsoft Excel to keep track of points. You will have immediate access to semester totals for each student, which will enable you to provide very timely feedback for grade inquiries. Remember to state very clearly on your syllabus how grades will be computed.

Literature

1. Karttunen, H. Fundamental Astronomy / H. Karttunen, P. Kroger, H. Oja, M. Poutanen, K. Donner. – Berlin, Heidelberg: Springer-Verlag, 2007. – 507 p.