GOALS FOR ASTRO 101: FROM THE AMERICAN ASTRONOMICAL SOCIETY

http://dx.doi.org/10.3847/AER2003016

Why do we teach introductory astronomy to non-science majors, and what do we want our students to take away with them at the end of the semester? After considerable discussion, AAS participants who represent large research astronomy departments came to the following consensus.

I. GOALS: CONTENT

Students should gain:

- a cosmic perspective -- a broad understanding of the nature, scope and evolution of the Universe, and where the Earth and Solar System fit in
- an understanding of a limited number of crucial astronomical quantities together with some knowledge of appropriate physical laws
- the notion that physical laws and processes are universal
- the notion that the world is knowable, and that we are coming to know it through observations, experiments and theory (the nature of progress in science)
- exposure to the types, roles and degrees of uncertainty in science
- an understanding of the evolution of physical systems
- some knowledge of related subjects (e.g., gravity and spectra from physics) and a set of useful "tools" from related subjects such as mathematics
- an acquaintance with the history of astronomy and the evolution of scientific ideas (science as a cultural process)
- familiarity with the night sky and how its appearance changes with time and position on Earth

II. GOALS: SKILLS, VALUES & ATTITUDES

Students should be exposed to:

- the excitement of actually doing science
- the evolution of scientific ideas (science as a cultural process)

Students should be introduced to how science progresses, and receive training in:

- the roles of observations, experiments, theory and models
- analyzing evidence and hypotheses
- critical thinking (including appropriate skepticism)
- hypothesis testing (experimental design and following the implications of a model)
- quantitative reasoning (and the ability to make reasonable estimates)
- the role of uncertainty and error in science
- how to make and use spatial/geometrical models.

And we should leave students:

- more confident of their own critical faculties
- inspired about science in general and astronomy in particular
- interested in, and better equipped to follow, scientific arguments in the media