**Learning goals in AST 111 (Stellar Evolution) **New

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Learning goals in AST 111 (Stellar Evolution)

**Knowledge and Conceptual Understanding**

1. Students will be able to review units of measurements and conversion between the units learned in lower classes. Students will be comfortable to read and understand new units and their comparison on different scales to other units in Astronomy. The following three steps will be followed to implement such goals:
* **Review:**Students should be comfortable to convert distance measured in Kilometers to distance measured in meters.
* **New knowledge:** Students will learn few new units of length, time and luminosity (brightness), temperature etc in Astronomy such as one light year.
* **Conceptual Understanding:** Students should be able to apply the knowledge and conceptual understanding of unit conversion in Astronomy i.e. students should be able to convert distance measured in one light year (Astronomy unit) to distance measured in meters (standard length unit) by second month of the semester.

If student learning outcome is improved in knowledge and conceptual learning about the units in Astronomy then the pace for the other learning goals can be set up. The other learning goals will be:

1. Understanding the physics laws that govern the universe such as Newton’s laws of gravitation, Kepler’s laws of planetary motion etc.
2. Understand the stellar evolution by analyzing the evolution of star’s life – birth, growth and death of star on HertzSprung Russell (HR) Diagram. The knowledge and conceptual understanding developed in learning goal 1 will be useful to understand the stellar evolution. For e.g. how brightness is changing with time (million of years). This would require understanding of concept like transition from one year to 1,000,000 years (different time scale).

**Thinking and Other Skills**

Students should develop a thinking to analyze the trends in big data sets. For e.g increasing distance of  star observation leading to decreasing brightness of similar stars OR changing size of star with increasing time.

**Attitudes, Values, Dispositions and Habits of Mind**

Students should always be able to recognize and reason the star’s phase or changes in characteristics of that phase in star’s life. For e.g. Is it new born star, middle aged star or dying star and form a “Habit of Mind” to place a star in HR diagram and reason the trends in temperature, brightness, size, spectral type change in star’s life phase.