

## Master Syllabus

### AST 1118 - Lab for Stars, Galaxies & the Universe

**Division:** Science, Mathematics and Engineering

**Department:** Astronomy

**Credit Hour Total:** 1.0

**Lab Hrs:** 3.0

**Date Revised:** June 2014

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#### Course Description:

Lab and field activities to supplement Stars, Galaxies & the Universe. Three lab hours per week.

#### General Education Outcomes:

- ▣ Critical Thinking/Problem Solving Competency

#### Course Outcomes:

##### Nebulae

Identify the major features of nebulae on photographs.

**Assessment Method:** Locally developed exams  
**Performance Criteria:** 60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:** 60% of items correct.

##### Celestial & Local Coordinates

Determine and locate objects using celestial and local coordinates.

**Assessment Method:** Locally developed exams  
**Performance Criteria:** 60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:** 60% of items correct.

##### Classification of Stella Spectra

Classify main sequence stars by spectral type using spectroscopy.

**Assessment Method:** Locally developed exams  
**Performance Criteria:** 60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:** 60% of items correct.

##### Galaxies

Locate and draw conclusions about sizes, structures, and distances of galaxies using features on photographs. Classify galaxies using Hubble classification scheme.

**Assessment Method:** Locally developed exams  
**Performance Criteria:** 60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:** 60% of items correct.

##### The Age & Expansion of Universe

Determine the rate of expansion of the universe and the age of the universe using the Hubble Law.

**Assessment Method:** Locally developed exams  
**Performance Criteria:** 60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:** 60% of items correct.

##### Lens, Mirror, & Basic Structure of Telescope

Synthesize the properties of lens and mirror, to explain the basic structure of telescopes.

**Assessment Method:** Locally developed exams  
**Performance Criteria:** 60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:** 60% of items correct.

##### Solar Activities

Determine the rotational rate of the Sun using sunspot images.

**Assessment Method:** Locally developed exams  
**Performance Criteria:** 60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:** 60% of items correct.

##### Star Colors & Temperature

Determine the temperatures of stars using the relationship between color and temperature for blackbodies.

**Assessment Method:** Locally developed exams  
**Performance Criteria:** 60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:** 60% of items correct.

### **Historical Instruments & Angular Measurements**

Apply angular measurements of local objects to determine their properties and motions.

**Assessment Method:** Locally developed exams  
**Performance Criteria:** 60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:** 60% of items correct.

### **The H-R Diagram**

Plot an H-R diagram using given stellar values of brightness and spectral class, and use the diagram to determine other properties of stars, such as mass, temperature, and radius. Determine the ages of star clusters using their turnoff points on an H-R diagram.

**Assessment Method:** Locally developed exams  
**Performance Criteria:** 60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:** 60% of items correct.

### **Photoelectric Photometry**

Determine the distance to a star cluster using photoelectric photometry.

**Assessment Method:** Locally developed exams  
**Performance Criteria:** 60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:** 60% of items correct.

### **Outline:**

Historical Instruments and Angular Measurements  
Celestial and Local Coordinates  
Telescopes  
Solar Activities  
Star Color and Temperature  
Classification of Stellar Spectra  
The H-R Diagram  
Photometric Photometry of the Pleiades  
Nebulae  
Galaxies  
The Age of the Universe