

## Master Syllabus

### AST 1112 - Stars, Galaxies & the Universe

**Division:** Science, Mathematics and Engineering

**Department:** Astronomy

**Credit Hour Total:** 3.0

**Lecture Hrs:** 3.0

**Prerequisite(s):** MAT 0100OR MAT 1110OR MAT 1130OR MAT 1445

**Date Revised:** May 2017

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### Course Description:

Properties and evolution of stars including the Sun; black holes and other stellar remnants; Milky Way and other galaxies; origin and fate of the universe. Students must sign up for concurrent lab sections.

### General Education Outcomes:

- Written Communication Competency
- Critical Thinking/Problem Solving Competency

### Course Outcomes:

#### Evolutionary Stages of the Sun and Stars

Describe the life cycle of stars, starting from their birth to their deaths and explain how their evolution depends on their mass.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

60% of exam items correct.

**Assessment Method:** Performance appraisals

**Performance Criteria:**

60% of items correct.

#### Big Bang Theory

Explain why the Big Bang theory is the accepted theory that describes the evolution of our universe based on the evidence we have to date. Be able to compare the possible outcomes for the future of our universe.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

60% of exam items correct.

**Assessment Method:** Performance appraisals

**Performance Criteria:**

60% of items correct.

#### Physical Properties of Galaxies and Active Galaxies

Be able to classify galaxies based on their appearance and physical properties. Describe the major properties of quasars and other active galaxies, and discuss current theories regarding their origin and evolution.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

60% of exam items correct.

**Assessment Method:** Performance appraisals

**Performance Criteria:**

60% of items correct.

#### Properties of Nebulae

Compare and contrast the properties of absorption, reflection and emission nebulae.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

60% of exam items correct.

**Assessment Method:** Performance appraisals

**Performance Criteria:**

60% of items correct.

#### Energy Generation and Physical Properties of Stars

Describe the proton-proton chain reaction within the core of stars and other mechanisms by which energy is generated. Explain how the physical properties of stars such as mass, temperature, radius and luminosity are measured or deduced and the relationships between these properties.

**Assessment Method:** Locally developed exams

**Performance Criteria:**

60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:**

60% of items correct.

**Nature of Electromagnetic Radiation**

Describe the nature of electromagnetic radiation, explain how light is produced and the various instruments that astronomers use in making observations. Apply the principles of spectroscopy to deduce basic properties like composition and temperature of celestial objects.

**Assessment Method:** Locally developed exams  
**Performance Criteria:**

60% of exam items correct.

**Assessment Method:** Performance appraisals  
**Performance Criteria:**

60% of items correct.

**Outline:**

Nature of electromagnetic radiation  
Energy generation and physical properties of stars  
Evolutionary stages of the Sun and stars  
Properties of nebulae  
Physical properties of galaxies and active galaxies  
Big Bang theory and fate of the universe