

**I. CATALOG INFORMATION**

- A. Discipline: ASTRONOMY
- B. Subject Code and Number: AST M01L
- C. Course Title: Introduction to Astronomy Laboratory

- D. Credit Course units:  
 Units: 1  
 Lecture Hours per week: 0  
 Lab Hours per week : 3  
 Variable Units : No

- E. Student Learning Hours:  
 Lecture Hours:  
 Classroom hours: 0 - 0  
 Laboratory/Activity Hours:  
 Laboratory/Activity Hours 52.5 - 52.5

**Total Combined Hours** in a 17.5 week term: 52.5 - 52.5

- F. Non-Credit Course hours per week \_\_\_\_\_
- G. May be taken a total of:  1  2  3  4 time(s) for credit
- H. Is the course co-designated (same as) another course: No  Yes   
 If YES, designate course Subject Code & Number: \_\_\_\_\_

## I. Course Description:

Reinforces principles and techniques of observational astronomy through the use of telescopes, star charts, and other common devices to observe and measure positions. Includes locating the moon, constellations, planets, stars, and other galactic and extragalactic sources.

## J. Entrance Skills

\*Prerequisite: No  Yes  Course(s)  
AST M01 or concurrent enrollment

\*Corequisite: No  Yes  Course(s)  
 \_\_\_\_\_

Limitation on Enrollment: No  Yes   
 \_\_\_\_\_

Recommended Preparation: No  Yes  Course(s)  
 \_\_\_\_\_

Other: No  Yes   
 \_\_\_\_\_

## K. Other Catalog Information:

## II. COURSE OBJECTIVES

Upon successful completion of the course, a student will be able to:

		<b>Methods of evaluation will be consistent with, but not limited by, the following types or examples.</b>
1	make observations with the telescope related to the Moon, planets, Sun, stars, galaxies, open clusters, and globular clusters; make measurements and record the data, such as, angular size, color, and morphology.	graded worksheets, lab reports, midterm, and final.
2	reduce and analyze the data, construct and analyze graphs, and report experimental findings and results using appropriate technical writing style.	graded worksheets, lab reports, midterm, and final.
3	critically evaluate the experimental results in light of accepted values and/or other relevant information and draw conclusions regarding experimental procedures.	graded worksheets, lab reports, midterm, and final.

## III. COURSE CONTENT

<b>Estimated %</b>	<b>Topic</b>	<b>Learning Outcomes</b>
<b>Lecture</b> (must total 100%)		
<b>Lab</b> (must total 100%)		
10.00%	Sky Observation	1, 2, 3
5.00%	Positions of Planets	1, 2, 3
5.00%	Star and Planet Locators	1, 2, 3
5.00%	Constellations	1, 2, 3
5.00%	Star Magnitudes	1, 2, 3
8.00%	Magnitude 5 Star Atlas	1, 2, 3
8.00%	Moon Phases	1, 2, 3
8.00%	Telescope Characteristics	1, 2, 3
8.00%	Universal Time	1, 2, 3
8.00%	Variable Stars	1, 2, 3
8.00%	Stellar Parallax	1, 2, 3
11.00%	Hertzprung-Russell (H-R) Diagram	1, 2, 3
11.00%	Cosmology	1, 2, 3

## IV. TYPICAL ASSIGNMENTS

## A. Writing assignments

Writing assignments are required. Possible assignments may include, but are not limited to:

1	<p>respond to questions from the pre-lab lecture and worksheets that require an essay or a brief answer, such as:</p> <p>What is the celestial sphere?                  What is the purpose of the Star Wheel (Planisphere)?</p> <p>Name and describe three different constellations seen in the winter sky from the Northern Hemisphere?</p> <p>If two stars are the same size, but one has a higher surface temperature, which star, if either, is more luminous? Explain your reasoning.</p>
2	<p>write conclusions and analyses in informal laboratory reports or worksheets using appropriate technical writing style for concepts covered in the course, such as the Doppler Effect, the expansion of the universe, and looking at distant objects.</p>

**B. Critical thinking assignments**

<p>Critical thinking assignments are required. Possible assignments may include, but are not limited to:</p>	
1	<p>calculate distances and sizes to deduce and compare astronomical scales, such as the light travel times and the sizes of celestial bodies. Examples would be:</p> <p>How long (in minutes) does it take for our radio communications to reach the Mars Curiosity rover?</p> <p>How many Earths could you fit across the face of the Sun?</p>
2	<p>evaluate the significance and relevance of cosmological studies leading to understanding of the age and evolution of the universe, such as the homogeneous expansion of the space between galaxies.</p>

**V. METHODS OF INSTRUCTION**

Methods of instruction may include, but are not limited to:

- Distance Education – When any portion of class contact hours is replaced by distance education delivery mode (Complete DE Addendum, Section XV)
- Lecture/Discussion
- Laboratory/Activity
- Other (Specify)  
Telescope demonstration and observing technique conducted by instructor.
- Optional Field Trips
- Required Field Trips

**VI. METHODS OF EVALUATION**

Methods of evaluation may include, but are not limited to:

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Essay Exam                      | <input type="checkbox"/> Classroom Discussion               | <input checked="" type="checkbox"/> Skill Demonstration |
| <input checked="" type="checkbox"/> Problem Solving Exam | <input checked="" type="checkbox"/> Reports/Papers/Journals | <input checked="" type="checkbox"/> Participation       |
| <input type="checkbox"/>                                 | <input type="checkbox"/>                                    | <input type="checkbox"/>                                |

Objective Exams       Projects       Other (specify)

Graded worksheets, laboratory reports, data collection log sheets.

## VII. REPRESENTATIVE TEXTS AND OTHER COURSE MATERIALS

Jandorf, Hal. Experiences in Astronomy Laboratory Manual. 3rd ed. Kendall Hunt, 2012.

Palen, Stacy, and Ana Larson. Learning Astronomy by Doing Astronomy. Norton, 2015.

McCrary, Nate, and Emily Rice. Astronomy Labs: A Concept Oriented Approach. Pearson, 2014.

## VIII. STUDENT MATERIALS FEES

No     Yes

## IX. PARALLEL COURSES

College	Course Number	Course Title	Units
CSU Los Angeles	ASTR 152	Principles of Astronomy Laboratory	1
CSU Long Beach	ASTR 100L	Introductory Astronomy Laboratory	1
CSU Northridge	ASTR 154L	Observational Astronomy	1

## X. MINIMUM QUALIFICATIONS

### Courses Requiring a Masters Degree:

Master's degree in physics, astronomy, or astrophysics OR bachelor's degree in physics or astronomy AND master's degree in engineering, mathematics, meteorology, or geophysics OR the equivalent.

## XI. ARTICULATION INFORMATION

### A. Title V Course Classification:

#### 1. This course is designed to be taken either:

- Pass/No Pass only (no letter grade possible); or  
 Letter grade (P/NP possible at student option)

#### 2. Degree status:

Either  Associate Degree Applicable; or  Non-associate Degree Applicable

### B. Moorpark College General Education:

#### 1. Do you recommend this course for inclusion on the Associate Degree General Education list?

Yes:  No:  If YES, what section(s)?

- A1 - Natural Sciences - Biological Science  
 A2 - Natural Sciences - Physical Science  
 B1 - Social and Behavioral Sciences - American History/Institutions  
 B2 - Social and Behavioral Sciences - Other Social Behavioral Science  
 C1 - Humanities - Fine or Performing Arts  
 C2 - Humanities - Other Humanities

- D1 - Language and Rationality - English Composition
- D2 - Language and Rationality - Communication and Analytical Thinking
- E1 - Health/Physical Education
- E2 - PE or Dance
- F - Ethnic/Gender Studies

C. California State University(CSU) Articulation:

1. Do you recommend this course for transfer credit to CSU? Yes:  No:

2. If YES do you recommend this course for inclusion on the CSU General Education list?

Yes:  No:  If YES, which area(s)?

- A1  A2  A3  B1  B2  B3  B4
- C1  C2  D1  D2  D3  D4  D5
- D6  D7  D8  D9  D10  E

D. University of California (UC) Articulation:

1. Do you recommend this course for transfer to the UC? Yes:  No:

2. If YES do you recommend this course for the Intersegmental General Education Transfer Curriculum (IGETC)? Yes:  No:

IGETC Area 1: English Communication

- English Composition
- Critical Thinking-English Composition
- Oral Communication

IGETC Area 2: Mathematical Concepts and Quantitative Reasoning

- Mathematical Concepts

IGETC Area 3: Arts and Humanities

- Arts
- Humanities

IGETC Area 4: Social and Behavioral Sciences

- Anthropology and Archaeology
- Economics
- Ethnic Studies
- Gender Studies
- Geography
- History

- Interdisciplinary, Social & Behavioral Sciences
- Political Science, Government & Legal Institutions
- Psychology
- Sociology & Criminology

IGETC Area 5: Physical and Biological Sciences (mark all that apply)

- Physical Science Lab or Physical Science Lab only (non-sequence)
- Physical Science Lecture only (non-sequence)
- Biological Science
- Physical Science Courses
- Physical Science Lab or Biological Science Lab Only (non-sequence)
- Biological Science Courses
- Biological Science Lab course
- First Science course in a Special sequence
- Second Science course in a Special Sequence
- Laboratory Activity
- Physical Sciences

IGETC Area 6: Language other than English

- Languages other than English (UC Requirement Only)
- U.S. History, Constitution, and American Ideals (CSU Requirement ONLY)
- U.S. History, Constitution, and American Ideals (CSU Requirement ONLY)

**XII. REVIEW OF LIBRARY RESOURCES**

A. What planned assignment(s) will require library resources and use?

The following assignments require library resources: N/A

B. Are the currently held library resources sufficient to support the course assignment?

YES:  NO:

If NO, please list additional library resources needed to support this course.

**XIII. PREREQUISITE AND/OR COREQUISITE JUSTIFICATION**

Requisite Justification for AST M01 or concurrent enrollment

A. Sequential course within a discipline.

1. gain an appreciation for the size, scale, and major celestial objects and constituents of the Universe.

2. understand the basic physics of light and matter required to explore and model celestial objects.

3. appreciate the interplay between observations and theory required

for scientific progress.

4. develop three-dimensional spatial visualization and reasoning using examples such as Earth-Moon-Sun dynamics and describing how stars orbit in galaxies.

5. interpret the data in figures and graphs, such as the Hertzsprung-Russell diagram.

6. distinguish between direct proportionality and inverse proportionality and evaluate how the resultant quantity changes using simple mathematical relations.

- B. Standard Prerequisite or Corequisite required by universities.
- C. Corequisite is linked to companion lecture course.
- D. Prerequisite or Corequisite is authorized by legal statute or regulation.  
Code Section: \_\_\_\_\_
- E. Prerequisite or Corequisite is necessary to protect the students' health and safety.
- F. Computation or communication skill is needed.
- G. Performance courses: Audition, portfolio, tryouts, etc. needed.

#### **XIV. WORKPLACE PREPARATION**

AST M01L: Not Applicable

#### **XV. DISTANCE LEARNING COURSE OUTLINE ADDENDUM**

AST M01L: Not Applicable

#### **XVI. GENERAL EDUCATION COURSE OUTLINE ADDENDUM**

**General Education Division of Learning** [check all applicable boxes]:

- Natural Sciences
  - Biological Science
  - Physical Science
- Social and Behavioral Sciences
  - American History/Institutions
  - Other Social Science
- Humanities

- Fine or Performing Arts
- Other Humanities
- Language and Rationality
  - English Composition
  - Communication and Analytical Thinking
- Health/Physical Education
- Ethnic/Women's Studies

**Check either Option 1 or Option 2**

- OPTION #1:** Moorpark College has already received approval from the CSU and/or UC systems for this course to fulfill a GE requirement. Note: This option applies only to technical revisions and updated courses.
- OPTION #2:** Moorpark College has not received approval from the CSU and/or UC systems for this course to fulfill a GE requirement. This option applies to all new and substantively revised courses.

**XVII. STUDENT MATERIALS FEE ADDENDUM**

AST M01L: Not Applicable

**XVIII. REPEATABILITY JUSTIFICATION TITLE 5, SECTION 55041**

AST M01L: Not Applicable

**XIX. CURRICULUM APPROVAL**

Course Information:

Discipline: ASTRONOMY

Discipline Code and Number: AST M01L

Course Revision Category: Outline Update

Course Proposed By:

Originating Faculty Farisa Morales 01/10/2015

Faculty Peer: Erik Reese 01/11/2015

Curriculum Rep: Scarlet Relle 01/28/2015

Department Chair: Ronald Wallingford 01/23/2015

Division Dean: Julius Sokenu 01/12/2015

Approved By:

Curriculum Chair: Jerry Mansfield 02/14/2015

Executive Vice President: Lori Bennett 02/12/2015

Articulation Officer: Letrisha Mai 02/02/2015

Librarian: Mary LaBarge 02/01/2015



Implementation Term and Year: Fall 2015

Approval Dates:

Approved by Moorpark College Curriculum Committee: 02/10/2015

Approved by Board of Trustees (if applicable): \_\_\_\_\_

Approved by State (if applicable): \_\_\_\_\_