

I. CATALOG INFORMATIONA. Discipline: ASTRONOMYB. Subject Code and Number: AST M01C. Course Title: An Introduction to Astronomy

D. Credit Course units:

Units: 3Lecture Hours per week: 3Lab Hours per week : 0Variable Units : No

E. Student Learning Hours:

Lecture Hours:

Classroom hours: 52.5 - 52.5

Laboratory/Activity Hours:

Laboratory/Activity Hours 0 - 0**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 creditH. Is the course co-designated (same as) another course: No Yes

If YES, designate course Subject Code & Number: _____

I. Course Description:

Surveys the origins, history, and accomplishments of the science of astronomy. Covers observational astronomy, light, telescopes, the solar system, stars, galaxies, and cosmology.

J. Entrance Skills

*Prerequisite: No Yes Course(s)
_____*Corequisite: No Yes Course(s)
_____Limitation on Enrollment: No Yes
_____Recommended Preparation: No Yes Course(s)MATH M01 or equivalentOther: No Yes

K. Other Catalog Information:

II. COURSE OBJECTIVES

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

		Methods of evaluation will be consistent with, but not limited by, the following types or examples.
1	gain an appreciation for the size, scale, and major celestial objects and constituents of the Universe.	Objective exams Problem solving exams Homework
2	understand the basic physics of light and matter required to explore and model celestial objects.	Objective exams Problem solving exams Homework
3	appreciate the interplay between observations and theory required for scientific progress.	Objective exams Problem solving exams Homework
4	develop three-dimensional spatial visualization and reasoning using examples such as Earth-Moon-Sun dynamics and describing how stars orbit in galaxies.	Objective exams Problem solving exams Homework
5	interpret the data in figures and graphs, such as the Hertzsprung-Russell diagram.	Objective exams Problem solving exams Homework
6	distinguish between direct proportionality and inverse proportionality and evaluate how the resultant quantity changes using simple mathematical relations.	Objective exams Problem solving exams Homework

III. COURSE CONTENT

Estimated %	Topic	Learning Outcomes
Lecture (must total 100%)		
5.00%	The scale of the cosmos and the scientific method	1, 3, 4, 5
5.00%	History of astronomy and Kepler's and Newton's Laws	1, 3, 4, 5, 6
6.00%	Basic physics of light and matter	2, 3, 5, 6
5.00%	Telescopes as tools for astronomy	2, 3, 5
6.00%	Constituents of the solar system and formation of the solar system	1, 4, 5
	The Earth and the Moon, including internal structure, magnetic fields,	

5.00%	and tides	1, 4, 5
5.00%	Terrestrial (Earth-like) planets: Mercury, Venus, Mars	1, 3, 5
5.00%	Jovian (Jupiter-like) planets: Jupiter, Saturn, Uranus, Neptune	1, 3, 5
5.00%	Moons, Rings, and Plutoids	1, 3, 5
6.00%	The Sun including its structure, nuclear fusion, and solar activity	1, 2, 3, 5
7.00%	Properties of stars: determining properties of stars by combining observation and theory, culminating in the Hertzsprung-Russell Diagram	1, 2, 3, 5, 6
5.00%	The interstellar medium and star formation	1, 2, 3, 5
5.00%	Stellar evolution: evolution of low and high mass stars	1, 2, 5
5.00%	Stellar remnants: neutron stars and black holes	1, 2, 5
6.00%	The Milky Way Galaxy: basic structure, formation of the Milky Way, evidence for dark matter and a central super-massive black hole	1, 2, 3, 4, 5
5.00%	Normal and active galaxies: galaxy types, classification, and active galactic nuclei	1, 2, 5
5.00%	Galaxies and dark matter: evidence for dark matter, galaxy collisions, large scale structure in the universe	1, 2, 5
6.00%	Cosmology: expanding universe, models of the universe, universal composition, and the supporting observations	1, 2, 3, 4, 5
3.00%	Life in the universe: scientifically approach the possibility of life elsewhere in the universe	1, 3

IV. TYPICAL ASSIGNMENTS

A. Writing assignments

Writing assignments are required. Possible assignments may include, but are not limited to:	
1	short answer and essay exam questions, such as: Briefly describe the basic properties of pulsars; including drawings/figures is encouraged.
2	short answer and essay homework questions, such as: What is the principle cause of the seasons on Earth? Give one reason that it cannot be due to the distance from the Sun.

B. Appropriate outside assignments

Appropriate outside assignments are required. Possible assignments may include, but are not limited to:	
1	participate in the scientific endeavor by classifying galaxies from observations made by world-class telescopes through the Galaxy Zoo project.
2	attend star parties, astronomical clubs, astronomy lectures at local universities, and special events at Moorpark College.

C. Critical thinking assignments

Critical thinking assignments are required. Possible assignments may include, but are not limited to:	
	apply physics principles learned in class to new situations depicted in homework or exam questions. An example would be:

1	If the temperature of the core of the Sun suddenly increased, describe what would happen in the core and outer layers.
2	interpreting the details behind complex figures and graphs. An example would be: Which type of star has the largest radius?

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)
Demonstrations illustrating physics concepts and spatial orientation of celestial objects.
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- Optional Field Trips
- Required Field Trips

VI. METHODS OF EVALUATION

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

- | | | |
|--|---|---|
| <input checked="" type="checkbox"/> Essay Exam | <input checked="" type="checkbox"/> Classroom Discussion | <input type="checkbox"/> Skill Demonstration |
| <input checked="" type="checkbox"/> Problem Solving Exam | <input checked="" type="checkbox"/> Reports/Papers/Journals | <input checked="" type="checkbox"/> Participation |
| <input checked="" type="checkbox"/> Objective Exams | <input checked="" type="checkbox"/> Projects | <input checked="" type="checkbox"/> Other (specify) |

Graded homework assignments.

VII. REPRESENTATIVE TEXTS AND OTHER COURSE MATERIALS

Seeds, Michael A., and Dana Backman. Horizons: Exploring the Universe. 13th ed. Cengage, 2013.

Comins, Neil F. Discovering the Universe. 10th ed. Freeman, 2014.

Fraknoi, Andrew, David Morrison, and Sidney Wolff. Voyages Through the Universe. 3rd ed. Cengage, 2005.

Chaisson, Eric, and Steve McMillan. Astronomy: A Beginner's Guide to the Universe. 7th ed. Addison-Wesley, 2013.

VIII. STUDENT MATERIALS FEES

- No Yes

IX. PARALLEL COURSES

<i>College</i>	<i>Course Number</i>	<i>Course Title</i>	<i>Units</i>
CSU Channel Islands	PHYS 107	The Stars and Beyond	3
CSU Northridge	ASTR 152	Elementary Astronomy	3
CSU Long Beach	ASTR 100	Astronomy	3
CSU Los Angeles	ASTR 151	Principles of Astronomy	3

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)
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- 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:

Written summaries of articles that have appeared in professional astronomical journals accessed through the library print and online resources.

- 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

AST M01: Not Applicable

XIV. WORKPLACE PREPARATION

AST M01: Not Applicable

XV. DISTANCE LEARNING COURSE OUTLINE ADDENDUM

1. Mode of Delivery

- Online (course will be delivered 100% online)
- Online with onsite examinations (100% of the instruction will occur online, but examinations and an orientation will be scheduled onsite)
- Online/Hybrid (a percentage of instruction will be held online and the remaining percentage of instruction will be held onsite)
 - Lab activities will be conducted onsite
- Televideo (Examinations and an orientation will be held onsite)
- Teleconference
- Other

2. Need/Justification

Improve general student access.

3. Describe how instructors teaching this course will ensure regular, effective contact with and among students.

Online instructors will provide lesson modules that require activities such as reading course material from a mandatory textbook and participating in discussion forums or chat room topics. Instructors may also meet with students for study sessions and online office hours using an online communication tool. Instructors will provide students with feedback on the content and quality of assignments and discussion posts. Additionally, instructors may engage students using the following communication activities available in the online classroom: contact students via e-mail within the course shell, by campus e-mail, and/or MyVCCCD; use the "announcement" tool to remind students of important assignments and due dates; provide students with an online schedule of class events using the "calendar" tool in the online course shell.

4. Describe how instructors teaching this course will involve students in active learning.

Instructors may involve students in active learning with the following activities: students may view video lessons and/or text-based lessons corresponding to course content and learning objectives; students may complete homework through the online course, and/or using an interactive online homework system provided by a publishing company; students may engage in internet searches and Library online database resources on topics corresponding to course content and learning objectives; students may test their knowledge with interactive online quizzes; students may interact with the instructor and classmates using an online discussion forum to ask questions; students may submit questions to the instructor by email or ask in person in a virtual classroom; instructor may create student groups or group activities using the online course.

5. Explain how instructors teaching this course will provide multiple methods of content representation.

The following represent the methods by which content may be provided for learning: instructional videos; textbook and professional journals; links to online resources that may include videos, quizzes, text explanations and extensions, and primary documents; homework assignments.

6. Describe how instructors teaching this course will evaluate student performance.

Students may take objective and essay exams in an online or on-ground teaching environment. Students may be required to do the following assignments: complete reflective writing assignments focused on application of course content; complete regular online quizzes; complete written assignments related to key course concepts; participate in online discussion forums.

XVI. GENERAL EDUCATION COURSE OUTLINE ADDENDUM

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

Natural Sciences

Biological Science

Physical Science

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- 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 M01: Not Applicable

XVIII. REPEATABILITY JUSTIFICATION TITLE 5, SECTION 55041

AST M01: Not Applicable

XIX. CURRICULUM APPROVAL

Course Information:

Discipline: ASTRONOMY

Discipline Code and Number: AST M01

Course Revision Category: Outline Update

Course Proposed By:

Originating Faculty Erik Reese 01/09/2015

Faculty Peer: Farisa Morales 01/10/2015

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 02/05/2015

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): _____