

- of basic astronomical phenomenon.
- E. develop sound reasoning skills as they are applied in astronomy.

IV. COURSE OUTLINE:

Lecture Content:

- A. The mathematics you need for this class
1. Review of exponents and logarithms
 2. Review of basic graph reading skills
 3. Review of the order of operations
- B. History of Astronomy
1. The earliest cosmological ideas
 2. The early Greek philosophers
 3. The theory of Epicycles
 4. Ptolemy
 5. Astronomy of Persia and Oriental Culture
 6. Copernicus
 7. Galileo
 8. Kepler
 9. Observational Astronomy
 10. Non observational astronomy
- C. The scientific method as it applies to this class
1. Observation of phenomenon
 2. Proposition of theory
 3. Data acquisition
 4. Data analysis
 5. Peer review
- D. Our solar system
- a. Planets
 1. Inner rocky planets
 2. Gaseous giants
 - b. Satellites
 1. Asteroid belt
 2. Comets
 - c. Motion
 1. Kepler's Laws of motion
- E. The Moon
1. Rotation and revolution
 2. Phases
 3. Eclipses
- F. Atoms, Light and Spectra
1. How astronomers "see" the composition of stars
 2. Electromagnetic spectrum
 3. Elements and spectral lines
- G. The Sun
1. Composition of our home star, one layer at a time
 2. Fusion of the proton-proton chain
- H. Our Milky Way and Galactic structure
1. Milky Way
 2. Galactic classification

3. Galactic motion and distribution

I. Stars

1. Stellar Evolution
 - a. Main sequence stars
 - b. Giants
 - c. Dwarves and Neutron stars
2. Constellations

J. Black Holes and Relativity

1. Escape velocity and the limitation of light speed
2. Light cones and embedding diagrams
3. Mass to radius ratios
4. Space-time “warping”
5. Time dilation
6. Length contraction

K. Cosmology

1. Defining the “universe”
2. The nature of “space”
3. The nature of “time”
4. Expansion of the universe
5. Problems and proposed solutions

Lab Content:

1. Measurement
2. Our Place in the Universe
3. Dimensional Analysis
4. Moon Phases
5. Planets
6. Orbits
7. Gravity
8. Kepler’s Laws
9. Solar System
10. Waves
11. Light
12. Spectroscopy
13. The Sun
14. H-R Diagrams

15. Galactic Model with salt

16. Stellar Evolution

17. Cosmology

V. APPROPRIATE READINGS

Reading assignments may include but are not limited to the following:

A. Sample Text Title:

1. Recommended - Bennett J, Donahue M, Schneider M, Voit M *Cosmic Perspectives Fundamentals*, ed. 1 Addison-Wesley, New York, 2010,

B. Other Readings

Global or international materials or concepts are appropriately included in this course

Multicultural materials and concepts are appropriately included in this course

If either line is checked, write a paragraph indicating specifically how global/international and/or multicultural materials and concepts relate to content outline and/or readings.

VI. METHODS TO MEASURE STUDENT ACHIEVEMENT AND DETERMINE GRADES:

Students in this course will be graded in at least one of the following four categories. Please check those appropriate. A degree applicable course must have a minimum of one response in category A, B, or C.

A. Writing Check either 1 or 2 below			
X	1. Substantial writing assignments are required. Check the appropriate boxes below and provide a written description in the space provided.		
	2. Substantial writing assignments are NOT required. If this box is checked leave this section blank. For degree applicable courses you must complete category B and/or C.		
X	a) essay exam(s)	X	d) written homework
	b) term or other paper(s)		e) reading reports
X	c) laboratory report(s)		f) other (specify)

Required assignments may include but are not limited to the following:

Essay questions on the exams, written answers to laboratory questions, and homework assignments will require substantial writing.

B. Problem Solving Computational or non-computational problem-solving demonstrations, including:			
X	a) exam(s)	X	d) laboratory reports
X	b) quizzes		e) field work
X	c) homework problems		f) other (specify):

Required assignments may include but are not limited to the following:

There will be computational and non-computational problem solving during exams, quizzes, on homework assignments and on laboratory reports.

C. Skill demonstrations, including:
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<input type="checkbox"/>	a) class performance(s)	<input type="checkbox"/>	c) performance exams(s)
<input type="checkbox"/>	b) field work	<input type="checkbox"/>	d) other (specify)

Required assignments may include but are not limited to the following:

D. Objective examinations including:			
X	a) multiple choice	X	d) completion
X	b) true/false		e) other (specify):
	c) matching items		

COURSE GRADE DETERMINATION:

Description/Explanation: Based on the categories checked in A-D, it is the recommendation of the department that the instructor's grading methods fall within the following departmental guidelines; however, the final method of grading is still at the discretion of the individual instructor. The instructor's syllabus must reflect the criteria by which the student's grade has been determined. (A minimum of five (5) grades must be recorded on the final roster.)

If several methods to measure student achievement are used, indicate here the approximate weight or percentage each has in determining student final grades.

Exams: 65% Homework: 15% Laboratory Reports: 10% Participation: 10%

VII. EDUCATIONAL MATERIALS

For degree applicable courses, the adopted texts, as listed in the college bookstore, or instructor-prepared materials have been certified to contain college-level materials.

Validation Language Level (check where applicable):	College-Level Criteria Met	
	YES	NO
Textbook	<u> X </u>	_____
Reference materials	<u> X </u>	_____
Instructor-prepared materials	<u> X </u>	_____
Audio-visual materials	<u> X </u>	_____

Indicate Method of evaluation:

Used readability formulae (grade level 10 or higher)	_____
Text is used in a college-level course	<u> X </u>
Used grading provided by publisher	_____
Other: (please explain; relate to Skills Levels)	_____

<i>Computation Level</i> (Eligible for MATH 101 level or higher where applicable)	<u> X </u>	_____
Content		
Breadth of ideas covered clearly meets college-level learning objectives of this course	<u> X </u>	_____
Presentation of content and/or exercises/projects:		
Requires a variety of problem-solving strategies including inductive and deductive reasoning.	<u> X </u>	_____
Requires independent thought and study	<u> X </u>	_____
Applies transferring knowledge and skills appropriately and efficiently to new situations or problems.	<u> X </u>	_____

List of Reading/Educational Materials

Recommended - Bennett J, Donahue M, Schneider M, Voit M *Cosmic Perspectives Fundamentals*, ed. 1 Addison-Wesley, New York, 2010, ISBN: 9780321566959

Comments:

_____ This course requires special or additional library materials (list attached).

This course requires special facilities:
Physics classroom

Attached Files:

<u>BASIC SKILLS ADVISORIES PAGE</u> The skills listed are those needed for eligibility for English 125, 126, and Math 101. These skills are listed as the outcomes from English 252, 262, and Math 250. In the right hand column, list at least <u>three</u> major basic skills needed at the beginning of the target course and check off the corresponding basic skills listed at the left.	
(eligibility for Math 101) (as outcomes for Math 250) <input checked="" type="checkbox"/> Performing the four arithmetic operations on whole numbers, arithmetic fractions, and decimal fractions. <input checked="" type="checkbox"/> Making the conversions from arithmetic fractions to decimal fractions, from decimal fractions to percents, and then reversing the process. <input checked="" type="checkbox"/> Applying the concepts listed above to proportions, percents, simple interest, markup and discount. <input checked="" type="checkbox"/> Applying the operations of integers in solving simple equations. <input checked="" type="checkbox"/> Converting between the metric and English measurement systems	Students will use: 1. the four arithmetic functions to complete homework assignments. 2. fraction to decimal conversions to complete homework assignments. 3. both the above listed, as well as the remaining math skills on examinations.
(eligibility for English 126) (as outcomes for English 262) <input checked="" type="checkbox"/> Using phonetic, structural, contextual, and dictionary skills to attack and understand words. <input checked="" type="checkbox"/> Applying word analysis skills to reading in context. <input checked="" type="checkbox"/> Using adequate basic functional vocabulary skills. <input checked="" type="checkbox"/> Using textbook study skills and outlining skills. <input checked="" type="checkbox"/> Using a full range of literal comprehension skills and basic analytical skills such as predicting, inferring, concluding, and evaluating.	Students will use reading skills: 1. while completing their homework assignments. 2. while performing the laboratory activities. 3. reading skills during examinations.
(eligibility for English 125) (as outcomes for English 252) <input checked="" type="checkbox"/> Writing complete English sentences and avoiding errors most of the time. <input checked="" type="checkbox"/> Using the conventions of English writing: capitalization, punctuation, spelling, etc. <input checked="" type="checkbox"/> Using verbs correctly in present, past, future, and present perfect tenses, and using the correct forms of common irregular verbs. <input checked="" type="checkbox"/> Expanding and developing basic sentence structure with appropriate modification. <input checked="" type="checkbox"/> Combining sentences using coordination, subordination,	Students will use writing skills: 1. to complete their homework assignments. 2. to complete their laboratory

and phrases. <input checked="" type="checkbox"/> Expressing the writer's ideas in short personal papers utilizing the writing process in their development.	activities. 3. during examinations.
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Check the appropriate spaces.

Eligibility for Math 101 is advisory for the target course.

Eligibility for English 126 is advisory for the target course.

Eligibility for English 125 is advisory for the target course.

If the reviewers determine that an advisory or advisories in Basic Skills are all that are necessary for success in the target course, stop here, provide the required signatures, and forward this form to the department chair, the appropriate associate dean, and the curriculum committee.

CONTENT REVIEW

REQUISITES
No requisites