ASTRONOMY 111   FALL 2014
Line Number: 70612
School of Earth and Space Exploration:
INTRODUCTION   TO   ASTRONOMY   I: Discovering the Solar System

INSTRUCTOR: Regents Professor Sumner Starrfield, Ph.D.
*OFFICE***:**   PSF 554
LECTURES: Tu-Thu 10:30am to 11:45am IN ROOM PSF-166
OFFICE HOURS: Tu-Thu 11:50 to - 12:30 IN PSF 554 (**AND BY APPOINTMENT <-- PREFERRED**)
      (THE DOOR WILL BE CLOSED-PLEASE KNOCK!)
*TELEPHONE***:** 965-5081, 965-8950 (messages) OR 965-7569 (office)
E-MAIL: starrfield@asu.edu (I answer E-MAIL so use this method to contact me–BUT
      put **AST 111 in the Subject line**)
*TEXTBOOK***:** **THE SOLAR SYSTEM: SEEDS AND BACKMAN: Available for $106.50 at the ASU Bookstore**
      EIGHTH EDITION-2013. Cengage Learning. ISBN: 9781305008977 at ASU Bookstore
Class Web Page: http:/starrfield111.asu.edu

NOTE: *This Class is not on Blackboard and I do not use Powerpoint. If either of these bother you then please take another section.*

COURSE DESCRIPTION

   This course is an introductory survey of modern astronomy and our understanding of **the Sun, Planets, and astronomical tools necessary to understand the properties of the Solar System.** It is designed for both **non-science** and science students. The only pre-requisite is a knowledge of basic high school arithmetic and algebra. AST 111 and AST 112 are designed to be separate courses and it is possible to take one without the other so we will be using two different texts: one for each class. We will follow the textbook rather closely but outside reading is encouraged. Note that the text has many good discussion and review questions and you are encouraged to study them since I will use some of them for exam questions. In addition, articles and notes in Scientific American, Sky and Telescope, Astronomy, ... often provide interesting and fruitful supplements to our text. They are available in the Noble Library. You will be responsible for all the assigned reading in the text, even if the material is not covered in class.

   I will hand-out a set of math and science questions. These questions are given to you to indicate if you have the skills necessary to work the problems given in class. If you cannot do many of the questions in this handout, I strongly suggest that you see me before continuing with the class. The answer key will be posted on a bulletin board on the second floor of Physical Sciences F wing across from the elevators (the floor above this classroom). You will receive 2 exam points for turning it in with your name on it.

TEXTBOOK

   Our textbook is a one semester version of a two semester introduction to astronomy. However, they did not renumber the chapters and so it seems peculiar that Chapter 19 directly follows Chapter 8. Plus they did not renumber the page numbers either. Nevertheless, this book is cheaper than the two semester version and hardly any students take the two semesters of introductory astronomy at ASU (111 and 112). I will also use the textbook publisher to provide additional information for you to assist in learning the material. There is a special edition printed just for ASU which has its own cover (not the one linked at online book sellers).

HONORS CREDIT:

   If you are in the Honors College, I encourage you to take this class for Honors Credit. I will expect additional work such as a term paper. You must see me if you are interested in doing this so we can agree on what will be necessary to obtain this credit.

EXAMS:

   All my exams are machine scored, multiple choice and are **open notes** only**. You may not use a cell phone, tablet, laptop, or our text during the test.** You must bring a picture ID to each exam and be prepared to show it upon demand.. I will hand out a review sheet before each exam outlining the material that I think is particularly important. However, you are responsible for coming to class and reading the textbook. The review sheet is not a substitute for either of these.
   There will be **three (3)** one hour exams during the semester each worth 50 points (50 questions worth one point apiece). Absence from an exam will result in a score of zero. I drop the lowest score among the three one hour exams so that there will be no make-up exam. **I cover material during the class that is not in the textbook**. I will, therefore, examine you on material that is not in the textbook. If this concerns you, I remind you that there is an attendance requirement for all classes at ASU. I do not take roll and satisfy the requirement by this method.
   The final exam is a two (2) hour exam and will be given on TUESDAY December 9, 2014 from 9:50am to 11:40am in PSF-166 (this classroom).   Everyone **must** take the final or you will Fail the course. **Do NOT make airline reservations for any time before our final exam - there will be no early finals**. The final exam is divided into two parts: one part covering the last quarter of the course and a second comprehensive part covering the entire course; it will be worth a total of 100 points.

Homework:

From time to time during the semester, I will hand out one page sheets with questions that require short answers. Some of them will involve going to the URL for an astronomy site (such as Astronomy Picture of the Day: see below) and answering the questions that I have posed. Each sheet will be worth 2 Exam points and I expect to hand out about 10 of these --more or less. I may also use some of the questions on these sheets as questions on the exams. **They will be due the next class period and the questions must be answered on the sheets that I have handed out. No copies and no late sheets will be accepted. These are a required part of the course and you must do at least 2 or 3 to pass this course. They are not extra credit - I add in the points before making up the final grade.**

FINAL GRADE

I will make up the grades by totaling the number of exam plus exercise points accumulated during the semester. I will construct a curve based on the person with the largest number of points. I cannot tell how many points will be necessary for a particular letter grade but would guess that about 170 are necessary for an A, about 150 for a B, and about 120 for a C. These numbers are only **approximate.**

COMMON COURTESY:

(1) Show up on time.
(2) Please do not leave class early and rustle papers in preparation for leaving before class is dismissed.
(3) Try to stay awake - putting your head down on the desk and going to sleep is very distracting.
(4) Don't read newspapers or surf the web or answer email with your laptop. I can tell when you are doing this by the laughter of the people behind you.
(5) Don t cheat off your neighbors exam sheet there is an honors code at ASU.
(6) **Turn off your Cell Phones and Pagers!**

ACADEMIC DISHONESTY:

In the Student Academic Integrity Policy manual, ASU defines Plagiarism [as] using another's words, ideas, materials or work without properly acknowledging and documenting the source. Students are responsible for knowing the rules governing the use of another's work or materials and for acknowledging and documenting the source appropriately. You can find this definition at:
http://www.asu.edu/studentaffairs/studentlife/judicial/academic_integrity.htm#definitions
Academic dishonesty, including inappropriate collaboration, will not be tolerated. There are severe sanctions for cheating, plagiarizing and any other form of dishonesty.(This statement included at the request of Provost Phillips)

ASTRONOMY Picture of the day: http://antwrp.gsfc.nasa.gov/apod/astropix.html

Schedule of Chapters (rough order - subject to change by announcement in class):

Week	Chapters	Subject Matter
1	Appendix A and 1	Units, Astronomical Data and the Scale of the Cosmos
2	2	The Night Sky
3	3 and 4	Cycles of the Moon and Origin of Modern Astronomy
4	5	Newton and Gravity
5	6	Light and Telescopes
6	7	Starlight and Atoms
7	8	The Sun as a Star
8	19	Origin of the Solar System
9	20	The Earth
10	21	The Moon and Mercury
11	22	Venus and Mars
12	23	Jupiter and Saturn
13	24	Uranus, Neptune, Pluto, Sedna, ...
14	25	Meteorites, Asteroids, Comets
15	26	Life on Other Worlds (maybe)

ONLINE Links

The online version of this syllabus has useful links so please bookmark it.

starrfield111.asu.edu

1. $1425 + 382 =$
        a)   1707   b)   1717   c)   1807   d)   1907   e)   none of the above

2.   IF $\frac{5}{8} * X = \frac{3}{16}$,   THEN X =   [* = times]

        a)   8/5   b)   1/2   c)   3/10   d)   10/3   e)   none of the above

3. $\frac{3}{8} + \frac{1}{6} =$

        a)   4/14   b)   1/2   c)   5/24   d)   13/24   e)   none of the above

4. $0.012 * 2.5 =$ [* = times]
        a)   3.0   b)   0.3   c)   0.03   d)   0.003   e)   none of the above

5.   IF $\frac{1.2}{X} = \frac{0.4}{1.5}$;   THEN X =

        a)   4.50   b)   3.20   c)   0.32   d)   0.45   e)   none of the above

6.   The area of a rectangle with sides of 10 meters and 50 meters is:
        a) 120 square-meters b) 100 square-meters c) 500 square-meters d) 70 square-meters   e) none of the above

7.   If the length of the side of a square is a, then the area of the square would be:
        a)   a   b) a^2 c) a^3 d) a^4 e)   none of the above

8. $10^2 * 10^8 =$ [* = times]

        a) 10^6 b) 10^9 c) 10^8 d) 10^{10} e)   none of the above

9. $\frac{10^{10}}{10^5} =$

        a) 10^9 b) 10^7 c) 10^6 d) 10^3 e)   none of the above

10.   If Flagstaff is 162.5 miles from Tempe and you drive at a steady speed of 65 miles per hour (just to annoy the truckers),
        how long will it take you to get to Flagstaff?
        a) 2.5 hours   b) 2.0 hours   c) 3.0 hours   d) 4.0 hours   e) none of the above

11.   How many grams in a kilogram?
        a)   10   b)   100   c)   1000   d)   10000 e)   none of the above

12.   Write 3/8 in decimal notation.
        a)   0.625   b)   0.5   c)   0.1   d)   0.375   e)   none of the above

13.   A car traveled 296 miles on 16 gallons of gasoline. What was the average number of miles per gallon?
        a)   16.2   b)   18.5   c)   20.1   d)   15.3   e)   none of the above

14. $4^3 =$
        a)   16   b)   24   c)   36   d)   64   e)   none of the above

15. $8^2 =$
        a)   16   b)   24   c)   36   d)   64   e)   none of the above

16. $(1/4)^3 =$
        a)   1/16   b)   1/24   c)   1/48   d)   1/64   e)   none of the above

17. $4/5 * (25/36) =$ [* = times]
        a)   5/9   b)   9/5   c)   100/190 d)   25/36   e)   none of the above

18. $\frac{1}{(1/3)} =$

a)	1/3	b)	3	c)	1	d)	9	e)	none of the above

19.	If A is inversely proportional to B, then as B decreases A must increase.
a)	True	b)	False

20.	If A is inversely proportional to B^2 and we double B, A will be _____?
a) 2 times larger b) 2 times smaller c) 4 times smaller d) 4 times larger   e) none of the above

21.	If the earth is about 5 billion years old and the universe is about 15 billion years old,
then the earth is one-third the age of the universe.
a)	True	b)	False

22.	One day is 24 hours.
a)	True	b)	False

23.	One year is about 365 days.
a)	True	b)	False

24.	The sun is a star.
a)	True	b)	False

25.	The earth is round.
a)	True	b)	False

26.	The moon revolves around the earth.
a)	True	b)	False

27.	All elements are made out of atoms which consist of a nucleus and electrons orbiting the nucleus.
a)	True	b)	False

28.	All the planets in our solar system orbit the sun.
a)	True	b)	False

29.	There is no evidence for planets orbiting other stars in our galaxy.
a)	True	b)	False

30.	There is evidence that at one time Mars had running water on its surface.
a)	True	b)	False
31.	The atmosphere of the earth is transparent to ultra-violet radiation.

a)	True	b)	False
32.	The largest operating telescope in the world has its controls marked in
a) English	b) French	c) German	d) Russian	e) Chinese

33.	The velocity of light in a vacuum is about
a) 300,000 km/sec	b) 186,000 mi/hour	c) 93,000,000 miles	d) 230,000 km/sec
e)120 Furlongs/Fortnight

34.	The largest operating optical telescope in the world is located in
a) Arizona	b) California	c) Russia	d) Puerto Rico	e) Hawaii

35	The human eye responds most strongly to electromagnetic radiation with a wavelength of about:
a) 1 Angstrom	b) 2500 Angstroms	c) 5000 Angstroms	d) 30,000 Angstroms	e) 10 Angstroms

36.	A hotter thermal emitter emits more total energy than a cooler thermal emitter
a)	True	b)	False

37.	The MMT has how many mirrors?
a)	1	b)	2	c)	4	d)	6	e) none-they are all lenses

38.	X-ray telescopes are located on satellites in earth orbit because
a) The earth's atmosphere is transparent to x-ray radiation	b) X-ray light is not resolved by ground based telescopes
c) X-rays from stars pass through ground based telescopes	d) The Earth's atmosphere is opaque to x-ray's

e) all of the above

39.   Radio telescopes are used primarily at which kind of focus:
a) Prime Focus   b) Newtonian Focus   c) Schmidt Focus   d) Hocus Focus   e) all of the above

40.   Each element in the periodic table produces a unique pattern of absorption line in its spectrum.
a)   True   b)   False