Astronomy 101: Week #3 Handout, 2006.01.31
San Diego State University, Prof. D. Leonard

Announcements

• Please note the following regarding homework assignments in this class:

1. Homework is assigned every week, but only collected every 4 or 5 weeks. The next collection will occur on Thursday, February 16. See the Course Syllabus handout for all of the collection dates this semester.

2. All homeworks will be graded using a “check” system, which can be translated into percentages via: √+ (A, 95%); √ (B, 85%); √- (C, 75%). (A grade of √++ (A+, 100%) may also be awarded for truly exceptional work; a √- - (D, 65%) may also be given for extremely poor work.) In general, a √- is given for acceptable to average work; a √ is given for above average to good work; and a √+ is awarded to exceptional work. Note that a portion of the homework grading is subjective: Simply putting the correct answer to a problem or a very brief response to an essay question will give you credit for the assignment (i.e., a √- or perhaps a √), but the best marks are reserved for those who respond with complete answers that discuss the thought process by which an answer was obtained.

3. Of your four homework marks, only the top 3 grades will count towards your final homework grade (which represents 10% of your final course grade).

4. All responses to homework questions must be typed; responses to mathematical problems may be handwritten.

5. **No late homeworks will be accepted for any reason.** If you will be missing a class during which homework is being collected, it is your responsibility to hand it in before the class meeting; you may put it in my mailbox in the astronomy department office. Also, never, EVER, email me a homework assignment. It will not be accepted. Finally, if you miss a homework collection, do not worry: it will simply be the grade that is dropped when determining your final homework grade (but don’t miss two collections!).

• A Course Reserve Binder will be available by the end of the week at the library’s Reserve Book Room. In it, you will find copies of all handouts and weekly assignments; note that the most recent assignment may not make it there until the end of a given week. In addition, to give you a better sense of what I’m looking for with the homework assignments, you will find examples of homework responses turned in by your classmates (maybe even you!) that I thought were particularly well done. Please do not remove any of the contents of the binders. (You may, of course, make copies of the handouts and/or assignments, but please return them to the binder in the correct place after you are done.)

• *(Optional) telescope viewing of Mars, Saturn, the moon, and nebulae!* On Wednesday evening, starting at 6:00 PM, you are invited to come to an “Open Night” on the roof of the Physics and Astronomy Building (where the domes are), where you will be able to look through telescopes at various celestial objects. The building will be unlocked, and there will be signs pointing out how to get up to the roof. I strongly encourage you to take advantage of this opportunity. The event is hosted by the Schwartz Astronomical Society, the undergraduate astronomy club here at SDSU. Additional Open Nights will be held roughly every other Wednesday during this semester. More information about the club and its activities can be found at:
   http://mintaka.sdsu.edu/sas/
   Note that before coming on Wednesday, take a look at the sky: if it is very cloudy out, then the event is canceled (telescopes cannot see through clouds!).

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Reading Assignment for Tuesday, February 7

•Handout: *A Mathematical Toolkit.*

Wondering about the math that will be used in this course? Then this *Toolkit* is for you. This handout reviews the basic mathematical concepts and skills that you will be expected to know and have for this class. While much of this may be review, it may have been some time since you last exercised this part of your brain, so please read the handout thoroughly and work through all of the examples. We shall not spend much class time reviewing this material, so if you do experience difficulty, please see me during office hours, or the TAs during help-room hours, for assistance. Remember: *now* is the time to get help with the mathematical component of this class!

•*Voyage Through the Universe*, Chapter 2.

This chapter on gravity is of fundamental importance to our study of astronomy, so please read it carefully! In this chapter you are shown one of the most important equations we shall encounter in the course (and one of the few that you are expected to know), Newton’s universal law of gravity:

\[ F = \frac{GM_1M_2}{R^2}. \]

**Writing Assignment**

Please answer the following two problems; the more complete and well-reasoned your answer is, the better. Since this week’s problems are highly mathematical, handwritten responses are appropriate.

1. What would be the orbital period of a planet orbiting the Sun with a semimajor axis of 4 AU?

2. Jupiter’s radius is roughly 10 times that of the Earth, and you may assume that both Jupiter and Earth are perfect spheres. What is the ratio of Jupiter’s *surface area* to that of the Earth?

*Hint:* Look at the Mathematical Toolkit’s example problems!