

# Solar System

Astronomy 211

Spring 2018 9:10 A.M. MWF

PEngel 319

## Instructor:

Name: Dr. Tom Kirkman

Office: PEngel 136/132

Phone: 363-3811

email: [tkirkman@csbsju.edu](mailto:tkirkman@csbsju.edu)

Office Hours: by appointment

Drop-by Informal Office Hours: 7:30 A.M. – 5:30 P.M.

## Texts:

- *Astronomy*  
by Andrew Fraknoi, David Morrison and Sidney Wolff (OpenStax; 2016)  
Chapters: 1–16, 21.3–21.6, 30, Note: this book is available as a free pdf
- <http://www.physics.csbsju.edu/astro/>

## Grading:

Your grade will be determined by averaging six scores: net lab-homework-quiz score, three exam scores, and the final exam score (which is double-counted). Assigned homework is due at the beginning of the next class period. Late homework is generally not accepted. Web-based homework will be graded based on the first submission. Usually quizzes are unannounced and consist of a few short-answer questions covering recently assigned readings or previously discussed lecture material. Expect almost daily quizzes during the first mod. Missed quizzes cannot be made up. There will be three night-labs at the SJU Observatory (located south of the cemetery), two ‘home labs’ that you do yourself, and several in-class lab experiences. Missed labs cannot be made up. *You will select a night-lab section next class period, so see if one fits into your schedule A.S.A.P.* If none of the suggested lab sections fit, see me today or tomorrow. Exams are about 1/3 true/false, 1/3 short answer, and 1/3 essay. Past exams are online. Exam dates are: February 16 (Friday), March 23 (Friday), and April 20 (Friday). If informed in advance, I may be able to accommodate exam conflicts. The final exam will be comprehensive and have a structure similar to the other exams (but with more questions since the testing period is longer). The final exam is scheduled for May 8 (Tuesday) at 10:30 A.M..

If you intend to take this course S/U, please provide me with a signed, unconditional notification *before* the start of the final.

## Questions:

There is no such thing as a dumb question. Questions asked during lecture do not “interrupt” the lecture, rather they indicate your interests or misunderstandings. I’d much rather clear up a misunderstanding or further develop a topic of interest than continue a dull lecture.

Remember: you are almost never alone in your interests, your misunderstandings, or your problems. Please help your classmates by asking any question vaguely related to astronomy. If you don’t want to ask your question during class, that’s fine too: I can be found almost any time on the 100-level floor of Engel Science Center. Ask if you don’t find me, as I spend just as much time in the nearby Physics labs (on Fridays: PENGL 102, 106) as I do in my office (PENGL 136).

## Topics:

This is an elementary course dealing with the “nearby” stuff of the universe: the planets, their moons, and the Sun, but not the other stars. We will begin by studying how the “points of light” in the night sky (Moon, planets, stars, . . .) seem to move over a day and through the years. We will discuss old and modern “explanations” for the motions. About half the course will deal with the planets as revealed by recent space probes. We will try to answer questions like: Why is Venus hot? What is in the atmosphere of Jupiter? Why are the rings of Saturn stable? Why are the planets so different? Why are there so few old rocks on Earth? Why is Earth’s atmosphere so different from the other planets? Of course, behind these surface questions lie the really interesting questions: Why do we ask the above types of questions? What determines whether an answer is “correct”? How robust are the questions and answers? If you are taking this course for MN teaching certification you should contact me ASAP as additional topics are required.

Night labs (and the first Mod of class) stress the night sky. How do the stars and planets seem to move during a day and over a year? How is the sky mapped? How can you find your way around in the sky? We hope to use both telescopes and binoculars to observe “deep-sky” objects and planets. Sunset times and finite instructor stamina limits us to three night labs. Labs occur rain or “shine.” With luck you’ll get three good (cloudless, dark) nights; with bad luck you’ll get three indoor nights (still at the SJU Observatory) using star charts. You should expect night lab material to appear on exams and in lecture.

**Warning:** The home labs have proven to be a significant problem for students. Self-scheduled, weekly observational homework (sky sketches) throughout the semester produces the data required to complete the lab’s calculations due near the end of the semester. Planning and diligence are required to make the sustained sequence of observations. Almost certainly weather (or events) will disrupt that plan; resilience in the face of adversity is required. Procrastination will result in failure: you must have the weekly observations to do the calculations. You are required to start your observations within the next three weeks; there is no reason you can’t start this weekend.

**Double Warning:** Falsification of data is a capital offense in science—those who are caught (and I believe most are) never work in science again. Correspondingly falsification of home lab data will be treated as academic misconduct; the minimum penalty is a zero for the entire homework-quiz-lab score ( $\frac{1}{6}$  of your grade). (The maximum penalty is expulsion but it is only rarely applied.) Much too frequently students submit drawings that are clearly falsified as they are impossible (a Moon above the horizon after it has set; drawings of stars when the all sky camera shows it was raining). If procrastination has made data collection impossible, you are much better off accepting a zero for that portion of the lab rather than risk detection. If you feel that you’re caught between a rock and a hard place by the home lab assignment, come in and talk to me about it.

## References:

<http://www.astro.wisc.edu/~dolan/constellations/> — Chris Dolan’s constellation web site.

<http://www.fourmilab.ch/yoursky/> — Sky maps from John Walker’s *Your Sky* web site.

<http://www.skymaps.com> — Download a monthly pdf sky map