ASTRONOMY 100 SUMMER 2019

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*** Please make sure to see me ASAP if you were not present on the first day of class ***

Welcome to ASTR 100Lg: The Universe! The marvelous ballet of the starry sky has fascinated mankind since prehistoric times. The questions, for instance, "Where are we?" and "What is the universe?" have spurred the development of astronomy. Since I am both a physicist and an astronomer, the course will also include discussions of the physics underlying the astronomical phenomena we will discuss. I will show how the quest for the nature of the universe has tremendously helped the development of physics. Physics, in turn, has paid back generously, by delivering the very concepts that allow us to understand the seemingly weirdest things in the universe. This course is designed specifically for those non-science majors who have very little, if any, background in the sciences and mathematics. The course is non-mathematical by prerequisite, but you will have to learn to do some calculations. However, these calculations will be very simple and will employ formulae that are easy to remember. You will have the opportunity to note that formulae represent ideas. Mathematics is the language of science.

1. TEXTBOOK AND OTHER RESOURCES

Bennett, Donahue, Schneider, Voit, *Physics: The Essential Cosmic Perspective*, 8th edition, Pearson, 2018 (7th Edition OK as well, but please talk to me if you don't have the 8th edition).

Astronomy on the Internet

There is a vast amount of information (and lots of pretty pictures) on the internet. I've listed some of these sites on a separate list published on Blackboard. You can also find many more sites by simply Googling the specific topic you're looking for. Also, Wikipedia is considered a (mostly) reliable source for astronomy, so don't shy away from using Wikipedia in your web searches.

2. GUIDELINES

2.1 Registration and administration

Your registration for this course consists of three separate parts: the lectures, a "quiz section," and the laboratory. You must register for each of them. The "quiz section" is the time slot allocated to the midterms and will NOT be used for this course.

The Undergraduate Physics Office in ACB 439 deals with all administrative aspects of this class. Additional help regarding administrative issues is available from Christina Tasulis Williams in ACB 439 with phone number 740-9174 and email address tasulis@dornsife.usc.edu.

2.2 Disabilities

Students who need to request accommodation based on disability are required to register each semester with the Office of Disability Services and Programs (DSP). This office can be found at

STU 301 with phone number 231-740-0776. A letter of verification to the instructor from the DSP is needed for the semester you are enrolled in. If you have any further questions please contact the DSP or the instructor.

2.3 Grading

Your grade will be determined according to the following key: 80% lectures: 15% Homework 40% Midterms (best two out of three, 20% each) 25% Final exam 20% laboratory

Broadly speaking, grading is done by the distribution curve of the combined scores of exams, homeworks and lab. No rigid percentage marks (such as, e.g., a rule that 90% corresponds to an A–, or similar) are used. Further details about the grading procedure are given in class.

You cannot pass the course if you do not earn a passing grade (14/20 or 70%) on the lab portion of the course.

2.4 Attendance

Attendance will be taken daily. Although attendance is not mandatory, students that regularly attend class will receive extra credit toward their final grade: attendance at 50% of class meetings will result in 1% extra credit, and attendance at 80% or more of class meetings will result in 2% extra credit, on a sliding scale. A medical excuse can't be used to "make up" class attendance for the purpose of earning extra credit points.

2.4 Exams

There will be three one-hour midterm exams and one two-hour final exam. The midterms will be given during second half of the class in which they are scheduled. Of the three midterms, only the scores of the two highest will be counted, and the score of the lowest of the three will be dropped. The midterms will cover the course material incrementally throughout the session, and the final exam will cover the whole course. The final exam will be administered during class time on the final day of the class and will be two hours in length. **All exams are closed book.**

Please note that the third midterm exam can serve as a make-up exam for either of the first two exams. There will not be any other make-up exams. Any student missing two of the three midterms will only have recorded the points scored on the one exam taken. Please inform me ASAP if you intend to miss the first or second midterm exams.

2.5 Homework

Homework assignments will be due every week. The homework must be turned in *by the end of the lecture* on the Thursday of each week that it is due, *not* at the end of the day. *No late homework will be accepted. Please make sure to staple together multiple sheets. All work submitted as loose pages will not be graded.*

I expect that it will take several hours to complete each of your homework sets. The homework sets are the central means by which to master the course material, and, consequently, to perform well in the exams. Since it is logistically impossible to return the graded homework in time for the exams, I will post the answers after the class in which the homework is due (on Blackboard, see below, p. 5). If you wish to compare your own answers with the posted solution sets before the exams, you should rely on your memory or make copies of your homework submissions.

The homework problems are intended to provide useful (but, by no means, comprehensive) preparation for the exams. Note, however, that the exams will have multiple choice questions, while the homework will involve longer problems with more complicated answers. (Exams will be graded by machines, homework by humans.)

While doing homework in groups is perfectly normal and even encouraged, you must explain the answers in such a way that the TA(s) (and I) are convinced that you understand what you have done!

Homework will count for 15% of your total score. Each homework assignment will be worth 100 points. To earn the full 15% on your homework grade, you'll need to accumulate 400 points out of the total 500 points possible, and your percentage grade for homework will be determined based on a maximum score of 400.

Homework Schedule

Homework #1	Due: May 23, 2019
Homework #2	Due: May 30, 2019
Homework #3	Due: June 6, 2019
Homework #4	Due: June 13, 2019
Homework #5	Due: June 20, 2019

2.6 Laboratory

The course Astronomy 100 has a **mandatory** laboratory component, and you should already be signed up for one of the laboratory sessions. The purpose of the laboratory is to give you some feeling for making and interpreting observations, thereby reinforcing some of the course material by direct experience. Indeed, without such experience, some of the theoretical material could appear a little too abstract. Another purpose is that you can get some hands-on experience in using a telescope: Often one can see spectacular pictures taken from large telescopes around the world or from the Hubble Space Telescope (HST) and you might be curious about what is possible from a small, but good "amateur" telescope.

I hope that our laboratory will enhance your experience and enjoyment of this course. Please appreciate the great logistical complexity of arranging laboratories for so many people with such a broad variety of backgrounds: I therefore kindly request your good will and patience in this enterprise.

Also, you will be required to attend an evening observation session. Observation sessions have been tentatively scheduled for June 11th, 12th and 13th, weather permitting.

Questions concerning the laboratory should be referred to the Lab Director, Joseph Vandiver (SGM 309; Phone: (213) 740-8889; Email: vandiver@usc.edu).

FIRST THINGS FIRST: Your First Laboratory Meeting

For our class (labs # 50803-50806), your first meeting will be held in the laboratory room SGM-313 in the week of May 15–16 on your specific laboratory day. It is very important to attend the first session.

For your convenience, I've included below the tentative basic laboratory schedule (courtesy of the laboratory director). Further details will be given during your first laboratory meeting. Please note that the organization of the laboratory is completely independent of the class. Therefore, your

laboratory grade (which, as mentioned before, constitutes 20% of your overall score) will be derived solely from your performance in the laboratory, and in accordance with the rules established by the laboratory.

Date of Term	Lab Sections	
May 15 th & 16 th	Lab Introduction	
May 20 th & 21 st	Basic Aspects of Astronomy	
May 22 nd & 23 rd	Optics	
May 27 th & 28 th	Holiday & Exam #1	
May 29 th & 30 th	Telescopes & Daytime Observations	
June 3 rd & 4 th	Starry Night	
June 5 th & 6 th	No Lab Meetings, Exam #2	
June 10 th & 11 th	Distance to M4	
June 12 th & 13 th	Kepler's Laws	
June 17 th & 18 th	No Lab Meetings, Exam #3	
June 19 th & 20 th	Digital Astrophotography	
June 24 th & 25 th	No Lab Meeting, Final Exam	

Astronomy 100 Lab Schedule Location SGM-313

3. SUPPORT

You have a variety of opportunities for support available to you.

3.1 Lecture

Do not underestimate the value of questions during the lecture period. In large lectures, many students are reluctant to pose questions that they fear might seem silly to their instructor or to their peers. Almost always, if one student asks a question, there are several other students who were wondering about the same issue. Often such questions tell the instructor what material might benefit from a more detailed discussion.

3.2 Instructor office hours

I will have three hours of office hours each week. Office hours will be held in SHS 360. If a large number of students show up to office hours, we will also use the conference room in SHS 363, where I will entertain questions from students in a group setting. Most of my time is filled by teaching or office hours, but if I'm in my office during other times, you're welcome to stop by for

a quick question (less than five minutes). You can also make an appointment to see me if you cannot make it to any of the office hours listed on the first page of the syllabus. In this case, it is best to contact me by email at least one day before you'd like to meet, or see me immediately after class.

3.3 Electronic assistance

Everyone registered in this course should find a link to the course in their *Blackboard* account. All information about the course will be posted on *Blackboard* at

http://blackboard.usc.edu.

At this address, you will find this Syllabus, important announcements, homework sets, etc. Solutions to your homework sets (after the due date) will be placed on *Blackboard*.

4. OBTAINING YOUR GRADES

You will be able to access your grades in Astronomy 100 via Blackboard at

http://blackboard.usc.edu.

5. ACADEMIC INTEGRITY

An overview of the USC academic integrity policy may be found at

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http://www.usc.edu/student-affairs/SJACS/forms/AcademicIntegrityOverview.pdf
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As mentioned above, working hard on the homework sets is the best preparation for the exams. You would hurt yourself, as well as your fellow students, by cheating.

6. FEEDBACK

Feedback regarding all aspects of these lectures is very much appreciated and welcome at any time. Please get in touch with your instructor via email, after lectures, or during office hours.

May 15	Summer Session classes begin
May 22	Last day to add this class
May 27	Memorial Day (University Holiday)
May 31	Last day to drop class without a mark of "W," and last day to change
	enrolment option
May 28	Midterm 1
June 6	Midterm 2
June 18	Midterm 3
June 17	Last day to drop class with mark of "W"
June 25	Final exam

7. SOME USEFUL DATES

8. COURSE SCHEDULE

Week	Start	Required reading
	date	
1	5/15	Chapter 1: A modern view of the Universe
		Chapter 2: Discovering the Universe for yourself
2	5/20	Chapter 3: The Science of Astronomy
		Chapter 4: Making Sense of the Universe: Understanding motion, energy, and gravity
		Chapter 5: Light: The cosmic messenger
		Chapter 6: Formation of the solar system
		Midterm 1 on 5/28 during class time
3	5/27	Chapter 7: Earth and terrestrial worlds
		Chapter 8: Jovian planet systems
		Chapter 9: Asteroids, comets, and dwarf planets
4	6/3	Chapter 10: Other planetary systems: The new science of distant worlds
		Chapter 11: Our star
		Chapter 12: Surveying the stars
		Midterm 2 on 6/6 during class time
5	6/10	Chapter 13: Star stuff
		Chapter 14: The bizarre stellar graveyard
		Chapter 15: Our Galaxy
		Chapter 16: A Universe of galaxies
6	6/17	Chapter 17: The birth of the Universe
		Chapter 18: Dark matter, dark energy, and the fate of the Universe
		Chapter 19: Life in the Universe
	L	Midterm 3 on 6/18 during class time
7	6/24	Review
		Final exam on 6/25: Chapters 1-18; 12:00pm