

ASTR 1020 – Stellar and Galactic Astronomy

Spring 2019

ASTR 1020 – CRN 27375

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Web Page: http://www.physast.uga.edu/~loris/astr1020/prob1020_sp19.html
Class Hours: MWF 12:20 – 1:10 PM in Physics 202
Office Hours: M 3:30 - 5:30 PM (or by appointment)

INTRODUCTION

Welcome to ASTR 1020. This course is a general introduction to astronomy beyond the solar system for non-science majors. We will cover the astronomy and astrophysics of stars and the Milky Way Galaxy, extragalactic objects (i.e., other galaxies and quasars), and cosmology (the study of the Universe as a whole). The principal goals of the course are to give you an idea of how a physical science like astronomy works and to introduce you to some of the latest discoveries about stars, galaxies and the Universe. Some of the topics we will cover are: our place in the Universe, the physics of light and radiation, how the Sun works, the formation and evolution of stars, what happens when stars run out of fuel, how the Milky Way Galaxy is organized, what other galaxies look like, and how did the Universe begin and how it is evolving. We will examine these things at an introductory level, but in enough detail to give you an understanding of each topic at a level that a well-educated person in the 21st century should have.

NB: Astronomy is a quantitative science. As such, we will treat many of the topics quantitatively using mathematics at the level of high-school algebra. We will also use a little bit of trigonometry but no calculus. I will expect you to be able to handle numerical problems involving simple algebraic equations and scientific notation, both on the homework and on the exams. Thus, you will need a scientific calculator for this course. Graphing calculators are OK.

This syllabus may be amended by Dr. Magnani unilaterally during the course of the semester as far as minor matters (i.e., what chapters will be covered, dates of exams), and on major issues (i.e., whether there should be more or less exams) if the students agree to the change.

COURSE MATERIALS

The following items are REQUIRED for this course:

- *The Cosmic Perspective* 8th edition – Bennett, Donahue, Schneider, and Voit
- A simple scientific calculator, to be used for arithmetic ONLY. It should be able to handle scientific notation. The use of PDAs, cellphones, or other electronic equipment with calculator functions is NOT allowed during exams.

STUDENT RESOURCES

The course web site at http://www.physast.uga.edu/~loris/ast1020/prob1020_sp19.html will have course information and announcements, homework assignments and solutions, exam solutions, etc..

If you cannot come to my regular office hours, or need additional help, please set up an appointment (by e-mail, phone, or in person).

Tutors are available either through the UGA Tutorial Program at Milledge Hall, or directly through the Department of Physics and Astronomy. (A list of tutors is available in the Physics Front Office – rm. 201). This notice should not be construed as an endorsement, recommendation, or requirement of tutors for this course.

GRADING POLICY

At the end of the semester, your overall grade will be determined from your performance on your best 3 midterm exams (out of 4) and the final exam. The weight for these components is as follows:

Best 3 (of 4) in-class exams – 23% each for a total of 69%
Cumulative final exam – 31%

We will have 4 in-class exams before the Final Exam on May 8, 2019. You will get to drop the lowest score of one of these 4 exams (N.B.: The final will not be dropped regardless of score). Only your best 3 scores out of the 4 exams during the semester will be used in calculating your in-class exam score with each of these exams counting 23% of your final score. The Final Exam will contribute 31% of your final score. Once the exams and the final exam scores will be tallied up, letter grades will then be assigned using the following scale:

A corresponds to 92.00 – 100.00

A-	corresponds to 88.00 – 91.99
B+	corresponds to 84.00 – 87.99
B	corresponds to 80.00 – 83.99
B-	corresponds to 76.00 – 79.99
C+	corresponds to 72.00 – 75.99
C	corresponds to 68.00 – 71.99
C-	corresponds to 60.00 – 67.99
D	corresponds to 50.00 – 59.99
F	corresponds to less than 50.00

Note: Grades will NOT be rounded up to TWO decimal places: for example, a final score of 87.99 is a B+ and will not be considered to be an A-.

EXAMS

There will be 4 in-class exams during the semester as well as a cumulative final exam. The format of the exams will be a combination of multiple-choice, short answers, and quantitative problems involving simple equations. All the exams will be closed-book and closed-notes. Most of the questions will be qualitative but, for the few quantitative questions, you may use a calculator for arithmetic only.

If you miss one of the exams due to serious illness or family emergency, a make-up exam will be administered within two weeks of the missed exam at a mutually convenient time. However, you may be asked to provide evidence of such illness or emergency and I am the final arbiter as to what constitutes an emergency.

HOMEWORK

I will assign homework nearly on a weekly basis (usually the questions will be problems from the end of the chapter that we are covering). You will get the assigned problems from my website. I will neither collect nor grade the homework (except for the extra credit, see below). If you have difficulty with it, I will be happy to discuss the homework problems with you during my office hours. Your incentive to do the homework is that many of the problems on the exams will be taken directly from it. Solutions will be posted on my website in a timely manner.

OPTIONAL EXTRA CREDIT

There is one, and only one, possibility for extra credit in this course. The extra credit is OPTIONAL. That means you don't have to do it unless you want to. What the extra

credit will get you is replacing the lowest of the three in-class exams (after you drop the lowest score of the four in-class exam) with the extra credit score. In other words, if you do the extra credit you can drop your lowest two exam scores; one gets dropped and just doesn't count, the other gets replaced by the extra credit score (assuming this extra credit score is higher than the lowest remaining exam score. This is the **ONLY** mechanism for extra credit. The extra credit consists of writing a 4-5 page essay on a topic assigned on weekly basis. The essay topic will be posted on the website, will be turned every few weeks, and will be graded. At the end of the semester, I will add up all your grades for the **OPTIONAL** turned-in essays and come up with a numerical score out of 100. This score will then replace your lowest exam score from the four remaining exam scores. This extra credit is an **ADDITIONAL** way to drop one of your in-class exams. And it is **OPTIONAL**. The last day to turn in a given optional extra credit essay is two weeks after it is assigned and will be clearly noted when the assignment is put online.

STUDENT RESPONSIBILITIES

Please make a reasonable attempt to arrive on time. If you must leave earlier than the scheduled end of class, please try to use the upper exits at the top of the lecture hall. Class disruptions or distracting behavior will not be tolerated.

You are responsible for all topics discussed in class, as well as class announcements. Although attendance is not mandatory, it is in your best interest to attend every class and absence from class does not excuse you from the above responsibility.

You are encouraged strongly to read the material that is to be covered in class ahead of time. If the schedule of readings changes from that posted in the second part of the syllabus below, then those changes will be announced in class.

You are responsible for the material covered for homework even though it will not be collected or graded. I cannot emphasize enough the importance of doing the homework. Your understanding of the relevant astronomical concepts will improve greatly if you attempt the homework problems. Should you get stuck or have any difficulty with them, I will be happy to discuss any homework problem with you during office hours (or at a mutually arranged time).

Ask for clarification on anything you find unclear, ambiguous, or unspecified. This includes both course policies and astronomical topics.

Know the rules concerning withdrawals and incompletes, published in the UGA *Undergraduate Bulletin*. Note that I will **NOT** withdraw you from the course for excessive absences.

ACADEMIC HONESTY

All students are responsible for knowing, understanding, and abiding by the academic honesty policy of the University of Georgia, which can be found online at

<http://honesty.uga.edu>

If you have any questions about this policy and how it pertains to your work in this course, please ask me for clarification.

CLASS SCHEDULE - TENTATIVE

The schedule below is approximate and subject to modification, possibly including the exam dates (though not the final). **Schedule changes will be announced in class.** You are expected to read the relevant textbook sections **before** the material is discussed in class.

Week of	Book sections	Topic(s)
Jan. 6	Chapter 1	Intro, Astronomy and Science
Jan. 13	Chapter 5	Light and Matter
Jan. 20	Chapter 5	More on Light and Matter
Jan. 27	Chapter 14	The Sun
Feb. 3	Chapter 14/15	The Sun and other Stars
EXAM 1: Friday, February 8, 2019 – Chapters 1,5, and 14		
Feb.10	Chapter 15	Surveying the Stars
Feb. 17	Chapter 16	How Stars Are Born
Feb. 24	Chapter 17	How Stars Live
EXAM 2: Friday, March 1, 2019 – Chapters 15, 16		
Mar. 3	Chapter 18	How Stars Die
Mar. 10	SPRING BREAK	
Mar. 17	Chapter 19	The Milky Way
Withdrawal deadline: Thursday, March 21		
Mar. 24	Chapter 20	Other Galaxies
EXAM 3: Friday, March 29, 2019 – Chapters 17, 18		
Mar. 31	Chapter 21	Galaxy Evolution
Apr. 7	Chapter 22	The Birth of the Universe
Apr. 14	Chapter 22	Big Bang Cosmology
EXAM 4: Wednesday, April 17, 2019 – Chapters 19, 20, 21		
Apr. 21	Chapter 23	Dark Matter and Dark Energy
Apr. 28	Chapter 23	Final Comments
Classes end Tuesday, April 30, 2019		
Reading Day: Wednesday, May 1, 2019		
Final Exam:	Wednesday, May 8, 2019, noon – 3:00 PM	Cumulative exam