SYLLABUS

ASTRO 113
Introduction to Modern Astronomy II


George Mason University
Tuesday and Thursday 3:00–4:15 pm, Lecture Hall, Room 1

Instructor: Professor R. Sambruna
Office hours: T-R 1:30pm-2:30pm or by appointment;
only by appointment after May 3
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1. ADDRESSING THE INSTRUCTOR

The proper way to address me is by my title, Professor or Dr. Sambruna. If you find my last name difficult to pronounce, you can just call me Professor or Dr.

2. COURSE DESCRIPTION

Welcome to Astro113. This is the second in a two-semester course designed to give you an overview of the Universe and its content. You will learn about the Sun and other stars, their formation and evolution; the Milky Way and other galaxies, normal and active; black holes and quasars; and the origin and evolution of the Universe.

GOAL OF THIS CLASS: My main goal in this class is to show you how science works. I do not want to transform you into an astronomer – unless you want to become one! Science is about thinking in a logical way, and learning about sorting through facts and retaining only the meaningful ones. Thinking in a scientific way empowers you, as it enables you to make informed decisions and thus to be in charge of your own life.
Astronomy is a quantitative science and you will be requested to understand and retain important concepts and related quantities. The language of astronomy, as of all quantitative sciences, is mathematics. Although we will not be using heavy math in the class, some simple high-school algebra will be necessary to understand some concepts. Once you realize math is only a tool, it becomes easy to follow through equations.

LECTURES: The lectures are intended to give you a review of the various concepts and guide you through the most important ones. You need to come prepared to class, having read the relevant chapters of the textbook in advance. Approximately, each week we will cover one chapter of the book. If you have any questions, you are welcome to ask during or after the lecture. The schedule of the lectures is at


It is your responsibility to check this page regularly for possible changes.

Lectures will start promptly on the hour. You are requested to show up in time for the start of the class – or not show up at all. Leaving in the middle of the lecture is very distracting for your classmates and instructor, beside being extremely rude. You also must turn off pagers and cell phones before entering the classroom. Food, drinks, and smoking are not allowed in the classroom. You must wear appropriate clothes and shoes in the classroom.

The instructor has the right and the authority to expel at any time anyone who disrupts the lecture or behaves inappropriately.


HOW TO STUDY FOR THIS COURSE: While each individual has her/his own style for studying, the following guidelines may be helpful to you. Please keep in mind: the key to succeeding in this class is to understand the concepts, not memorize them. This is a course on exercising your brain, not your memory. Having said this, there will be very few fundamental numbers that you will need to remember, and I will tell you which ones.

Tips on how to study efficiently:
1) Before the Lecture, read well the corresponding chapter in the book. Start with the “Key Ideas” at the end of the chapter, and then go back to the beginning of the chapter and read through. Understand the key concepts.

2) Download my slides from the course Website. Follow through during the Lecture taking your own notes. Note: Last-minute slides may be posted on the Web before the Lecture. If you can’t print my slides, you can always take your own notes during the class.

3) After the Lecture, in the quiet of your room, go over the slides, your notes, and the book chapter again. Think about the material discussed in class. Make sure you understand the concepts fully as if you had to explain them to one of your friends. Do this possibly the same day as the Lecture.

4) Look at the pictures and read their captions. Often a concept becomes more clear from a Figure.

5) Test yourself using the Review and Advanced Questions sections at the end of each Chapter. Don’t wait to test yourself until the day (few hours?) before the exam.

6) Write down questions and ask me!

Note: You are encouraged yo ask questions about the course material at any time in class or during office hours. Don’t be shy! There is NO such thing as a “stupid question”. As far as I am concerned, all questions are relevant.

3. EXAMS

There will be a total of 4 examinations, one (1) final and three (3) in-class exams. Each in-class exam will count 30% of the final grade and the final will count 40% of the final grade. I will drop the lowest score among the three in-class exams. I will NOT drop the final under any circumstance.

You are not allowed to take any exams or the finals in another section of the course with another instructor without asking me prior permission.

Exams consist of 50 multiple choice questions. Most of the questions require that you have understood the concept; only very few will require remembering some fundamental number.

Exams are difficult. You need to study before taking the exams and you will be responsible for knowing the material and for the grade you get.

Preparing for the exams: Before each exam, I will post on the course Website sample questions to help you prepare. Additionally, during the Lecture before each exam I will give in-class self-tests to supplement the sample
questions. And you can always find additional tests in the book at the end of each Chapter.

Remember to bring your Scantron Sheet at the exam. I will NOT provide Scantron sheets.

At the end of the exam, you will hand in the Scantron and the test with your name on both. Photo ID is required at checkout, and will be checked carefully. You may be asked to show a second photo ID if the first one is unclear.

**HONOR CODE AND EXAM POLICY:** You are encouraged to study and work together in preparation for the exams. On the exams and final you must work alone. If you are caught cheating during test, you will be brought before the academic honor council. If you are found guilty, you will receive a severe penalty which may include an F in the class, a permanent mark in your transcript noting this conviction, suspension, or expulsion.

I take the honor code VERY seriously. To reduce the cheating which occurs on exams, the following rules will be enforced:

- **YOU MUST BRING YOUR STUDENT ID TO BE ADMITTED TO THE EXAM.** Every exam will have a 100% photo ID check. The proctor may require a second photo ID if the first one does not have a clear picture or writing is confused. No exceptions.

- **YOU WILL NOT BE ALLOWED TO TAKE THE EXAM IF YOU ARE MORE THAN 10 MINUTES LATE.** Since exams leave the lecture hall when the first person completes his/her exam, I can not allow late arrivals to take the test. At exactly 10 minutes after the start of the exam, I will close the door, and nobody is allowed in. Do not even bother knocking. **It is your responsibility to be on time for the exam** - make sure your car starts, your watch is on time, drive safely, wake up in time, etc.. If you arrive after the door is closed, you will not take this test. No exceptions.

- **BATHROOM BREAKS DURING EXAMS ARE NOT ALLOWED.** Sorry, but you will have to go before the exam or hold it.

- **NO CALCULATORS, PHONES, OR PAGERS ALLOWED.** The proctors will be watching for any electronic devices.
• **NO HATS DURING THE EXAM**, especially baseball hats covering your eyes.

• **YOU MAY BE RESEATED DURING THE EXAM** if I, or the proctors, think you should be. You must comply with this request, or you will automatically get an F.

While I am available to help you before, during, and after the lecture classes, you are entirely on your own during the exams. **I can not and will not answer content-related questions during the exams.** The exam questions are all very clearly formulated with no possibility of misunderstanding.

### 4. GRADES

The following standard grading policy is adopted:

• A+=96–100%

• A=91–95%

• A-=86–90%

• B+=81–85%

• B=76–80%

• B-=71–75%

• C+=66–70%

• C=61–65%

• C-=56–60%

• D=50–55%

• F=0–49%
I will NOT answer questions about grading at any time in class. If you have a question about your grades you will need to come to the office hours individually (no group expeditions).

**MAKEUPS AND EXTRA CREDIT:** Since the lowest exam score will be dropped, **no makeups will be given under any circumstance.** No exceptions.

Similarly, **there are no extra credit assignments** at any time. With three exams and a final, you have ample opportunity to do well.

**ABOUT YOUR GRADE IN THIS CLASS:** In this class, you will get **exactly** the grade you deserve after 3 exams and the final by mathematical weighted average. This still holds if you are a senior, on a sport team, on probation, etc. It is YOUR responsibility, not mine, to make sure you get the grade you need by studying hard enough and doing well on the exams.

If you are studying hard and still fail, come to see me EARLY enough to talk about your difficulties. Come to office hours or make an appointment. Get a tutor. Join or form a study group. Do NOT wait after the third failed exam to be concerned about your grade. **I do NOT have magic solutions that will improve your grade two weeks away from finals.** And I really mean it - just ask the students from previous years.

Your grade in this class after 3 exams and the final will NOT be changed, for any reason and at any time. Not after the finals, not three months after the end of the semester, or one year from it. Your grade in this class is definitive. No exceptions.

5. **EXAM SCHEDULE**

Each of the in-class exams will start at 3:00pm and end at 4:15pm. Please note that the final is on a different time: 1:30pm-4:15pm. Dates of the exams:

- **First Exam:** February 10, 2004. Content: the Sun, Measuring the stars, Interstellar Medium, and the HR diagram.
- **Third Exam:** April 20, 2004. Content: Milky Way, Normal and Active galaxies, Cosmology.

Reviewing the exams: Although the tests are different each year, I do not return tests or scantrons. If you want to review your exams, you need to come to office hours before the end of classes. I will not be reviewing exams 1 and 2 after exam 3.

6. ANNOUNCEMENTS

Announcements concerning the class and exams will be posted on the course Web page:


as needed. It is entirely your responsibility to check this page regularly in order not to miss out on important announcements.

7. COMPUTER SUPPORT

Computer and/or Web support is not my responsibility. You can find help as well as available workstations at the Johnson Center. Ask the information desk at the Johnson Center.

8. HOW TO SUCCEED IN THIS CLASS

To do well in this class you need to:

• Attend the Lecture and pay attention to what I say. Ask questions. Take notes. Study after each Lecture.

• Understand the concepts, not memorize them.

• Read the book chapter before coming to class.

• Test yourself using the self-tests at the end of the chapter and the sample questions I post on the Web before each exam, and take the self-tests I give in class before every exam.

• Don’t cram for the exams.

• Come and see me as soon as you are having difficulties.
If you have trouble, consider getting a tutor. Contact the Physics Department for a list of approved tutors. Join or form a study group.