Astronomy 111: The Solar System

Fall 2022

http://mason.gmu.edu/∼pbecker/astr111.html

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Introduction

Welcome to Astronomy 111 section 002 (CRN 74220). This course is designed to give you an overview of the solar system and the methods of astronomy. It has been developed for non-science majors who wish to gain a better understanding of the universe around them. Note that a mathematical background including high school algebra, geometry, and trigonometry is necessary to do well in this course. By the end of the semester, you will have learned about the following subjects:

- The history of astronomy from prehistory to the present.
- The properties of the planets and the evolution of our solar system.
- The scientific method and critical thinking.
- The nature of light and the principles of telescope design.
- The properties of other solar systems.

The associated laboratory course ASTR 112 is strongly recommended, but it is not a required part of this course.

COVID-19 Protocol

Due to the ongoing COVID-19 pandemic, masks are optional for all students attending the live lectures in David King Hall room 1006. If you feel unwell, or you're uncertain about your COVID-19 status, or you feel uncomfortable attending lectures on campus, each lecture will also be available via a simultaneous (synchronous) Zoom session. This way, you will not miss any content even if you prefer not to attend the live presentation in the classroom for one or more of the lectures.

General Information

- I will be presenting the lectures simultaneously both in the classroom (David King Hall room 1006), and also via Zoom at the regular class time, which is on Monday and Wednesday, from 12:00pm-1:15pm.
- A Zoom link that can be used to attend the lectures remotely is available on the Blackboard page for the course.
- The lectures will not be recorded by me, but I will give you permission to record them on Zoom if you wish to do so for future reference during the semester.

• Questions during the lecture will be handled either live in the classroom or via the Chat feature in Zoom.

• The PowerPoint files for each lecture will be available on the Blackboard page for the class.

• Exams will be given using Respondus and LockDown Browser. They can be taken either at home, or at the COS Testing Center (**ttc.gmu.edu**), which is located on the Fairfax campus.

Exams and Grading

There will be three exams during the semester, and a comprehensive final exam, which is optional. Letter grades for the semester will be determined based on the semester grade average using the following scale:

A = 90 – 100
A– = 85 – 90
B+ = 80 – 85
B = 75 – 80
B– = 70 – 75
C+ = 65 – 70
C = 60 – 65
D = 50 – 60
F = 0 – 50

Grade Posting

All exam grades will be posted on Blackboard.

Class Material

The lectures will closely follow the text, "Astronomy Today," 9th Edition, Volume 1, by Chaisson & McMillan, with additional demonstrations and audio/video presentations. I will also be using images obtained using the James Webb Space Telescope and the Hubble Space Telescope, as well as data acquired using Galileo, Pathfinder, Chandra, Kepler, Fermi, the Mars Rovers, and other U.S. and international space missions. The lectures will emphasize and clarify the important points covered in the text. The exams will be based upon the material presented in the lectures and the text. **Detailed review materials will be provided before each exam.**

Office Hours

My office is located in room 251 of Planetary Hall, and my phone number is 993-3619. My email address is pbecker@gmu.edu. I will be available for online

office hours by appointment. Due to the pandemic, email is the best way to reach me.

Other Help

Lecture slides, study questions, review materials, and practice exams are all available online by pointing your browser to the URL at the top of this syllabus, or by visiting the Blackboard site for the class. If a great deal of help is needed outside class, the university has a tutoring service available for a relatively small fee. Additional assistance may also be obtained through the physics help room. Please don't wait until you are hopelessly lost before asking for help!

GMU Honor Code

You are encouraged to study and work together on the review problems. **However, exams must be completed without aid or collaboration of any kind.** If you cheat during a test, you will be brought before the GMU Honor Committee. If convicted, you face possible expulsion from the university. Despite the large size of this class, there are effective security mechanisms in place, and sadly, almost every year a couple of people are sent to the Honor Committee for cheating on the exams in ASTR 111.

Fall 2022 Lecture and Exam Schedule

Lecture	Chapter	Date	Pages	Description
1	1	8/22	1 - 9	Introduction, Our Place in Space
2		8/24	10 - 17	Solar Motion
3		8/29	18 - 32	Lunar Motion
4	2	8/31	33 - 38	Geocentric Universe
5		9/5		NO CLASS
6		9/7	39 - 47	Copernican Revolution
7		9/12	48 - 58	Newton & Kepler
8	3	9/14	59 - 66	Light Waves
9		9/19	67 - 78	Radiation Spectrum
	1 - 3	9/21-23	1 - 78	EXAM 1
10	4	9/21	79 - 87	Atomic Spectra
11		9/26	88 - 98	Atomic Structure
12	5	9/28	99 - 113	Optical Telescopes
13		10/3	114 - 131	Non-Optical Telescopes
14	6	10/5	132 - 140	The Solar System
15	6	10/11	141 - 159	The Solar System
16	7	10/12	160 - 167	Earth's Atmosphere
17		10/17	168 - 186	Earth's Interior
	4 - 7	10/19-21	79 - 186	EXAM 2
18	8	10/19	187 - 213	Moon and Mercury Interior & Surface
19	9	10/24	214 - 232	Venus
20	10	10/26	233 - 259	Mars
21	11	10/31	260 - 285	Jupiter
22	11	11/2	260 - 285	Moons of Jupiter
23	12	11/7	286 - 325	Saturn
24	12	11/9	286 - 325	Moons of Saturn
25	13	11/14	326 - 332	Uranus and Neptune
26	14	11/16	333 - 362	Pluto
	8 - 13	11/16-18	187 - 332	EXAM 3
27	15	11/21	363 - 375	Comets and Asteroids
28		11/23		NO CLASS
29	15	11/28	376 - 383	Solar System Formation

30	16	11/30	384 - 416	The Sun
	1 - 16	12/12	1 - 416	FINAL EXAM 10:30AM - 1:15PM