Astronomy 112 – Session 225

The Solar System

Course Description | Assignment Description | Grading Scale | Schedule | Course Policies | University Resources

Date and Time: Thursday 10:30 AM - 01:10 PM

Location: Planetary Hall 112

Instructor: Prof. Jie Zhang

Email: jzhang7@gmu.edu

Office: Planetary Hall 257

Office Hours: Wednesday 03:00 PM – 04:00 PM

Important Dates:

August 22: First Day of Class
August 29: Last Day to add a course
September 5: Labor Day (no classes)
September 6: Last Day to drop with 100% tuition refund
September 13: Last Day to drop with 50% tuition refund

Course Description:

The Solar System lab goes along with the Solar System lecture course, Astronomy 111. The purpose of this course is to help students understand the process of science through astronomy investigations and the use of realistic simulations. An important learning goal is to help students understand and practice the rudiments of scientific reasoning as a model for investigations in other disciplines.

Blackboard Login instructions:

Access to My Mason and GMU email are required to participate successfully in this course. Please make sure to update your computer and prepare yourself to begin using the online format BEFORE the first day of class. Check the IT Support Center website. Navigate to the Student Support page for help and information about Blackboard. In the menu bar to the left you will find all the tools you need to become familiar with for this course. Take time to learn each. Make sure you run a system check a few days before class. Become familiar with the attributes of Blackboard and online learning.

Textbook

There is no textbook required for this course. All material can be found in the course on blackboard. If you are currently enrolled in ASTR 111, the assigned textbook will be a good reference for this course. If you have no Astronomy book available, you can go to Astronomy and download the PDF or read the book online. It is available to you for free from OpenStax and you will also find a link to it in the course.

Course learning Outcomes

1. Understand how scientific inquiry is based on investigation of evidence from the natural world, and that scientific knowledge and understanding-
    a. evolves based on new evidence
    b. differs from personal and cultural beliefs.
2. Recognize the scope and limits of science.
3. Evaluate scientific information (e.g., assess credibility and validity of information).
4. Participate in scientific inquiry and communicate the elements of the process, including:
    a. making careful and systematic observations,
    b. developing and testing a hypothesis,
    c. analyzing evidence, and
    d. interpreting results

Course Schedule

Lab	Week of	Topic	Assignment Description
1	08/25	Course Introduction (mandatory attendance)	*Do you know…..?*- Orientation to lab procedures and introductory activity
2	09/01	Observatory visit	*Do you know that the GMU Observatory is one of the largest on campus telescopes on the East coast?* - In the first part of this lab you will learn about how images are created and get an introduction to the observatory. Students need to sign up for an observatory tour. In the second part students will visit the observatory during the semester and write a report. The report is due one week after the tour is completed.
	09/08	Labor Day Week (no classes)	Sections do not meet during this week
3	09/15	Solar System Walk	*How big is the Solar system?* -You will learn how to scale and build a model of the solar system. You will be introduced to building formulas in Excel and in using a spreadsheet for data analysis.
4	09/22	Observing the Sky	*How can I find an object in the sky?* - You will learn about the different coordinate systems in Astronomy and use a model of a celestial sphere to navigate the sky.
5	09/29	Orbits and Gravity	*Why don't planets fall into the Sun*? - This lab focuses on Kepler's laws and how they describe the motion around the Sun. You

Lab	Week of	Topic	Assignment Description
			will learn the connection between Kepler's Laws and Newtonian Gravity.
6	10/06	The Moon	*Do you know what a waning crescent is*? - in this lab you will learn about the phases of the Moon and how tides are influenced by the Moon.
	10/13	Columbus Day Week (no classes)	Sections do not meet during this week
7	10/20	Properties of Light	*Why are light rays sometimes reflected and sometimes bent when they encounter another object?* – You will explore the nature of light and how it propagates through media. Specifically, you will learn about reflection and refraction in a hands-on experiment.
8	10/27	Reflectance Spectroscopy	*How do we know what the surface of a planet consists of?* – In this lab you will analyze light reflected by different objects. You will gather data of different rock samples and from those data identify which rock it is.
9	11/03	Mars	*Have you ever wondered what geological processes formed Mars?* -You will analyze different pictures from the surface of Mars with respect to different geological activities.
10	11/10	Atmospheres	*Why do planets have so different atmospheres*? - In this lab you will learn about different types of planetary atmospheres and how they influence the impact of meteoroids coming through to the surface.
11	11/17	Habitable Zones	*Why is it so difficult to find another Earth*? – You will learn what it takes for a planet to create life as we know it.
	11/24	Thanksgiving Recess Week	Sections do not meet during this week
12	12/01	Make-up Lab	Students who missed one lab can use this session to do a make-up lab

Assignments

Pre-lab assignments: The pre-lab assignments must be completed by 11:59 pm the day BEFORE your section meets. These are open notes open book quizzes, but must be your own work.

In class group assignments: You will work in small groups during the scheduled class time to explore the lab topic, gather data to use in an investigation of the concept and answer questions based on what you have found. These are completed in class and submitted before the end of the class each week.

Observatory out of class lab (25 points in class, 75 points observatory tour): This lab is unique in that it is a combination of an in-class group activity and an individual tour that you will sign up for on a date and time that you can attend. A report on the tour is due one week after you attend your selected tour. More information and sign up for the tours will be available during the first week of class.

Course Policies

Attendance: You are expected to attend each of the scheduled sessions. If some emergency arises (illness, etc.), you must contact the instructor in advance if possible. You have one "Free-ticket", an individual make-up lab the week after Thanksgiving break.

Instructor-Student communication: Your instructor will respond to your emails as quickly as possible. Before sending an email, please, check the syllabus. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.

Lab Safety: Students must comply with lab safety rules. The lab safety handout is posted on blackboard in the "Introduction" content folder. Students are required to print it out, read it carefully, then sign it and bring it to the first day of class.

Cell phones: Cell phones must be turned off and **stowed away from the lab table**. Students who are caught texting, emailing, or checking emails on their cell phone during class time, will be asked to leave the laboratory room and will receive a grade of "zero" for the lab.

Computer use: The computers in the lab room are to be used for class work only. Computers may not be used to work on assignments for other classes. To be able to access all software installed for this course, students must log on with the given username and password. Students should never use their Mason Net ID. You need to use the lab computer. Do not bring your own computer to the lab. **Do NOT turn off the computer before you leave.**
Lab-computers may not be used for any purpose until the pre-lab lecture is over.

Classroom courtesy: Use the lab time to work on Astronomy only. Students who disrupt the classroom with loud, inappropriate, or off-topic conversations may be asked to leave the lab after a warning. Show courtesy to your fellow students and to your instructor by giving whole-hearted attention to the topic at hand.

Food and drink: This is a computer lab and food and drink are not permitted in the lab room**.**

Visitors: You may **not** bring visitors to the lab with you, even if they are students enrolled in other sections of the course. **Students may not complete their work or make up missed labs in other sections.** You must attend the section in which you are enrolled in order to get credit for the class.

Grading Scale

Your grade is based on the points from 10 lab exercises. Each lab is worth up to 100 points (90 points for lab report and 10 for quiz), with a possible maximum of 1000 points. Your grade is assigned as shown below

Points	Letter Grade
930-1000	A
900-929	A-
870-899	B+
830-869	B
800-829	B-
750-799	C+
700-749	C
670-699	C-
600-669	D
Below 600	F

University Policies and Resources

Academic Integrity: GMU is an Honor Code university; please see the university catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Plagiarism is a violation of the honor code. Sharing of instructor created materials, particularly materials relevant to assignments, to public online "study" sites is considered a violation of Mason's honor code. It also violates important ethical standards.

Students are required to comply with all university policies. For more information go to https://universitypolicy.gmu.edu/all-policies/

Safe Return to Campus Statement: This is a face-to -face course. All students are required to follow the university's public health and safety precautions and procedures outlines in the university Safe Return to Campus webpage https://www.gmu.edu/safe-return-campus.

Campus Closure or emergency Class Cancelation/Adjustment Policy: If the campus closes, or if a class meeting needs to be canceled or adjusted due to weather or other concern, students should check Blackboard for updates. Your instructor will send out an announcement how to continue learning and for any changes to events or assignments.

Withdrawal: If you need to withdraw from this course you must do it within the University established time frame. For fall 22 the last day to withdraw with no tuition penalty is September 6. From then on tuition penalties apply. See the GMU academic calendar https://registrar.gmu.edu/calendars/fall_2022/for other important dates.

Diversity and inclusion: We seek to create a learning environment that fosters respect for people across identities. We welcome and value individuals and their differences. We encourage all members of the learning environment to engage with the material personally, but to also be open to exploring and learning from experiences different than their own.

Resources

Office of Disability Services:

If you are a student and you need academic accommodations, please see me and contact the Office of disability Services (ODS) at 993-2474. All academic accommodations must be arranged though the ODS. https://ds.gmu.edu/
COVID -19 Note: Students who have a Covid-related disability should contact the ODS. The instructor is not expected to create accommodations outside of the DS official guidelines.

Other Useful Campus Resources:
Learning services Department helps students with time management and study skills. Use this resource for short classes, videos to watch, or counseling toward becoming a master of your own time. https://ulife.gmu.edu/

Writing Center:
A114 Robinson Hall; (703)993-1200 https://writingcenter.gmu.edu/

Counseling and Psychological Services (CAPS):
(703)993-2380; https://caps.gmu.edu/