



Astronomy 112 - asynchronous

Spring 2022

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Office hours: by appointment online

Spring 2022 academic calendar <https://www.printfriendly.com/p/g/77Ak6g>

Course Description

This is the laboratory that goes along with the introductory 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.

Required Textbooks

There are no required textbooks for this course. All materials will be found in the course on Blackboard. If you are currently enrolled in Astronomy 111 the assigned textbook will be useful for background information. In addition, the course has a link to the text, *Astronomy*, a free, open education resource from OpenStax.

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. Recognize and articulate the relationship between natural science and society and the application of science to societal challenges

4. Evaluate scientific information (e.g., distinguish primary and secondary sources; assess credibility and validity of information).
5. 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
 - d. Interpreting results

Technology Requirements

Hardware: You will need access to a Windows or Macintosh computer with at least 2 GB of RAM and access to a fast and reliable broadband internet connection (e.g., cable, DSL). A larger screen is recommended for better visibility of course material. You will need speakers or headphones to hear recorded content and a headset with a microphone is recommended for the best experience. For the amount of Hard Disk Space required taking a distance education course, consider and allow for the storage amount needed to install any additional software and space to store work that you will do for the course.

Software: You will need a browser and operating system that are listed compatible or certified with the Blackboard version available on the [myMason Portal](#). See [supported browsers and operating systems](#). Log in to [myMason](#) to access this course. Make sure your computer is protected from viruses, see some possibilities here: [Mason IT suggested antivirus software](#).

Students owning Macs or Linux should be aware that some courses may use software that only runs on Windows. You can set up a Mac computer with Boot Camp or virtualization software so Windows will also run on it. Watch [this video](#) about using Windows on a Mac. Computers running Linux can also be configured with virtualization software or configured to dual boot with Windows.

Note: If you are using an employer-provided computer or corporate office for class attendance, please verify with your systems administrators that you will be able to install the necessary applications and that system or corporate firewalls do not block access to any sites or media types.

Lab Procedures

You should do your best to complete each week's lab well in advance of the due date to give you a chance to ask questions if you have difficulty with the materials. For best results read the materials posted before beginning the report. Your instructor may set up multiple attempts so that if you make an error when you submit to the drop box you can correct and re-submit. The instructor will grade only the last attempt, so make sure all relevant documents are complete in that last submission.

Observatory tour

Each section will have designed evenings for touring the observatory, either in-person (depending on university policies based on pandemic concerns) or virtual. Sometime after the first week of class you will get instructions about how to sign up and dates available for your section. Once you have completed the tour please submit a short description of the tour including details about what you saw, what you learned, weather conditions,

whether the tour was open or closed dome and other relevant information. Submit on Blackboard in the drop box. It should be completed within a week of attending the tour.

Course Schedule – *This syllabus is for multiple sections and indicates the week materials should be available, your instructor may set a different time during the week when submissions for that week are due. Lab topics may change during the semester.*

Assignments week of	Lab Topic (subject to change)	Overview
January 24	Introduction to the lab – syllabus and schedule overview – Check in and intro to observatory	Orientation to lab procedures and introductory activity
Time and date will vary by section.	1-GMU virtual observatory tour	Take a virtual tour of the GMU observatory with a small group of students on a real time but distanced tour
January 31	2-Solar system walk	Understand size and scale of solar system and its place in the universe. Practice with spreadsheet.
February 7	3-Navigating the sky	Orienting earth in space. Practice with coordinate systems.
February 14	4-The Moon	Understanding moon phases and motion
February 21	5-Planetary motion	Focus on Kepler’s laws and motion of objects around the Sun
February 28	6-Measuring the planets	How we can know the mass, radius, and density of planets
March 7	7-Planetary atmospheres	Exploring differences in atmospheres of solar system planets.
March 14 – 20	Spring break	No lab assignment this week.
March 21	8- Solar system formation	Exploring the theory of how the solar system came to be and looking at supporting data
March 28	9-Exploring Mars geology	Searching for geological features, similar to those on earth, to understand similarities and differences.
March 28	10 – Habitability lab	Developing a theory of what makes a planet habitable and testing by gathering data in a simulated environment.
April 4	11-Make-up Lab - TBA	If needed for technological or persona reasons with permission of instructor.
May 11 – 18	<i>Final exam week - No final exams for Astronomy 112 labs</i>	

Instructor-Student Communication: Contact the instructor if you have problems. Email is generally the best way to get in touch, but your instructor may also offer other options. Before sending an email, please check the following (available on your Blackboard course menu) unless the email is of a personal nature:

1. Syllabus
2. Ask the Professor
3. On-demand Blackboard videos on how to use Blackboard features, and Technical Requirements.

Feel free to respond to other students in the Ask the Professor forum if you know the answer.

Grading Scale

Your grade is based on the points from 10 lab exercises. Each lab is worth a maximum of 100 points for a possible total of 1000 points. Grades are assigned according to the table below.

Points	Letter grade
930 - 1000	A
900 -929	A-
870 - 899	B+
830 -86	B
800 -829	B-
750 -799	C+
700 -749	C
670 -699	C-
600 -669	D
Below 600	F

University Policies and Resources

- a. Academic Honesty: You are expected to be familiar with and abide by the University's Honor Code. The Code can be found [here](#). It is your responsibility to see your instructor if you have questions about these policies.
- b. Sharing of instructor created material: Sharing of instructor-created materials, including materials relevant to assignments or exams, to public online "study" sites is considered a violation of Mason's Honor Code. For more information, see the Office of Academic Integrity's [summary of information about online study sites](#).
- c. Student services: The University provides range of services to help you succeed academically and you should make use of these if you think they could benefit you.
- d. 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 (at least a few times a week in case your instructor needs to notify you about changes and updates. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- e. The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services. Counseling Center: Student Union I, Room 364, 703-993-2380.

- f. Students with disabilities who seek accommodations in a course must be registered with the [George Mason University Office of Disability Services \(ODS\)](#) and inform their instructor, in writing, at the beginning of the semester. All academic accommodations must be arranged through that office. Please note that accommodations MUST BE MADE BEFORE assignments or exams are due. I cannot adjust your grade after the fact.
- g. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
- h. [The George Mason University Writing Center](#) staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. University Writing Center: Robinson Hall Room A114, 703-993-1200. The writing center includes assistance for students for whom English is a second language.
- i. **Diversity:** George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth.