Course ASTR 112: Introductory Astronomy Lab:

The Solar System

Summer 2021

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Instructor: Dr. Gabriele Belle
Email: (preferred contact) gbelle@gmu.edu
Phone: (202)230-4266
Office hours: Monday: 6:00 to 6:30 pm, Wednesday 6:00 to 6:30 pm and by appointment
May 19: Last day to add classes
May 19 Last day to drop classes without penalty
May 25 Last day to drop (50% tuition penalty)
June 2 - 9 Selective withdrawal period

Course Description

This is the laboratory portion of 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 MyMason 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 is no textbook assigned to this course. You will need to install certain programs available from the web on your computer to complete assignments. The course learning modules and assigned web reading will provide the necessary information to complete this course. For convenience a free online textbook in form of a PDF file was added to 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. 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

Nature of Course Delivery

The format of this online course is asynchronous and is structured around 10 learning units consisting of exercises and quizzes. As online courses do not have a "fixed" meeting date, lab exercises can be completed anytime between assignment due dates. Lab reports and quizzes must be submitted before or on the due date. Submission deadlines are listed in the schedule. The course schedule is not synchronized with the equivalent face-to-face course.

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 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:

1. the storage amount needed to install any additional software and
2. space to store work that you will do for the course.

If you consider the purchase of a new computer, please go to Patriot Tech to see recommendations.

Software: Many courses use Blackboard as the learning management system. 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 your registered courses. Online courses typically use Acrobat Reader, Java, and Windows Media Player, QuickTime and/or Real Media Player. Your computer should be capable of running current versions of those applications. Also, make sure your computer is protected from viruses by downloading the latest version of Symantec Endpoint Protection/Anti-Virus software for free here.

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.

Course-specific Hardware/Software

You need to download and install the following software specific to this course:
Stellarium: This is a planetarium software available for free and if you have problems downloading you might be able to use the web version of it. Go to https://stellarium.org/ to download the software. It is available for both PCs and Macs.

Java: Some simulations will require Java. If you have problem installing it on your computer, please contact support@gmu.edu. Download the software here: https://www.java.com/en/
MS Excel or another spreadsheet software for data analysis.

Course Schedule

Note: schedule is subject to change. Check Blackboard regularly for changes in assignments or materials.

Assignments are due on Monday Wednesday and Friday. All assignments must be submitted at the latest by **11:59 pm on Wednesday, june 16** which is the last day of summer session A.

	Lab	Due Dates
1	**Solar System Walk** – Understanding models and distances	Wed, May 19
2	**The Moon** – Exploring the Moon	Fri, May 21
3	**Investigating Planets** – Getting acquainted with our cosmic neighborhood	Mon, May 24
4	**Navigating the Sky** – Understanding the celestial sphere	Wed, May 26
5	**Kepler's Laws –** Observing planetary motion in the sky	Fri, May 28
6	**Solar System Formation** –Discover how the Solar system was born	Wed, June 2
7	**Properties of Light** – Understanding light and its use in astronomy	Fri, June 4
8	**Exploring Mars** – Exploring the surface of the "red" planet	Mon, June 7
9	**Atmospheres –** Exploring planetary atmospheres	Wed, June 9
10	**Exoplanets** – The search for life	Fri, June 11

Assignments Description

You will be expected to prepare for each lab by reading the lab handouts and supplemental material. Reports, graphs and short writings are due before the end of the assignment period. Due dates are listed in the schedule. Quizzes should be completed at the latest after the lab report is submitted.
Lab exercises: Each lab will be graded on the basis of the material I ask you to submit. The total maximum point value for the lab write-up is 100 points.

Course Policies

Late Assignments: All assignments must be turned in on the due date given on the assignment sheet. If you need an extension, please contact your instructor.

Instructor-Student Communication: I will respond to your emails within 24 hours. If I will be away from email for more than one day, I will post an announcement in the Blackboard course folder. 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 Your 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 Your Professor forum if you know the answer.

Grading Scale

Grades are based on 10 online assignments. Grading is as follows.

- 100 points maximum for each answer sheet and associated materials turned in on blackboard
- 10 points maximum for each quiz

Total possible:

- 1000 points for 10 online assignments which count for 90% of your final grade
- 100 points for 10 online quizzes which count for 10% of the final grade.

Each lab missed results in zero points for that lab and reduces your grade by one letter. Missing four labs will result in failure no matter how good your grades are on the labs you completed.

Letter Grade	Percentage
A	93-100
A-	90-92.9
B+	87-89.9
B	83-86.9
B-	80-82.9
C+	75-79.9
C	70-74.9
C-	67-69.9
D	60-66.9
F	below 60

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 me if you have questions about these policies. George Mason University has an honor code that states the following:

To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the

student members of the University Community have set forth this: Student Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.

b. Students must follow the university policy for Responsible Use of Computing
c. Student services: The University provides a range of services to help you succeed academically and you should make use of these if you think they could benefit you. I also invite you to speak to me (the earlier the better).
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. 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 (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance. 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.