Active Learning Astronomy 111 section DL2
Fall 2021 Syllabus

Section: Astro 111 DL1
Instructor: Rebecca Ericson
Days: Material released Wednesday AM, weekly assignments due Tuesdays at midnight
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Office phone (Ericson): 703-993-4588
Office Hours: Monday 2:30 – 4 (in person in Planetary 201B) and by appointment

Text Books (Required):

Textbook: This course has been designed as an "Open Educational Resource" course. This means that we have found a free on-line textbook, courtesy of Open Stax at Rice University. It is printable, or you can simply download and read the PDF copy. You can access it here as well: http://cnx.org/content/col11992/latest/

Technology requirements:

You will need reliable computer access to participate in this course. You will need to ***check emails (use your GMU account) and Blackboard regularly*** and will be required to submit materials and take quizzes online.

Please be sure you have adequate technology to access the site and do the required work. Go to My Mason, sign in and select the Courses tab, then look for the Astronomy 111 course. If you need help there is a section of the courses page of My Mason called *Courses 9.1 Resources for Faculty and Students* with helpful links. Other sources of help with Blackboard:

- Contact courses@gmu.edu and include your Mason email and G#
- Walk in and Phone support at the Collaborative Learning Hub, Johnson Center 311, (703) 993-3141
- Contact the ITU Support Center at (703) 993-8870 for general help, including login or network issues

COURSE GOALS: This collaborative, active learning science course fulfills 3 credit hours of general education science. If taken with a section of the Solar system lab (Astronomy 112), it satisfies the natural science core requirement for a lab science t GMU. It is designed to provide a stimulating environment for learning about the solar system and how astronomers come to understand things like the scale of the solar system and its likely origins as well as details about the various planets and other components of the solar system.

In addition to learning the basic facts necessary to have a good mental picture of the solar system and objects in it, students will have a chance to consider how scientists construct, test and evaluate theories, a powerful way of thinking that can be applied outside of purely scientific fields.

Natural science goals: The general education natural sciences courses engage students in scientific exploration; foster their curiosity; enhance their enthusiasm for science; and enable them to apply scientific knowledge and reasoning to personal, professional and public decision-making.

To achieve these goals, students will:

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 the natural sciences and society and the application of science to societal challenges (e.g., health, conservation, sustainability, energy, natural disasters, etc.).
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

EXPECTED SKILLS: Some assignments require basic algebra and geometry skills. You will need to be able to enter formulas and work with a spreadsheet as well. Because homework and lecture material will be on-line and in the Blackboard course, reliable internet access is vital, and you will need to check email and Blackboard daily for updates and information.

COURSE STRUCTURE AND PHILOSOPHY: Readings, supplemental videos, and weekly quizzes plus journals discussion questions and at-home assignments are on Blackboard. This allows you to work in a somewhat self-paced and relaxed environment as you learn traditional lecture material.

In order to really understand you need to do something with the material. This includes posting regular journal entries, participating in short on-line discussions, doing some "at home investigations" (simple hands-on projects to help you understand some of the concepts in a more physical way), and a final project or final exam.

To succeed it is important for you to commit to doing your best working and thinking as you study the on-line materials and prepare journals, etc.. The level of engagement and commitment required for this class is greater than for a typical lecture. As with all things worth doing, it will require effort, attendance, and preparation.

This course will have succeeded if - long after you have forgotten the composition of the atmosphere of Jupiter - you remember how to ask the kinds of questions a scientist might ask and continue to develop curiosity and interest about how the world works.

POLICIES:

Withdrawal – note the deadlines for this semester. Decide early if this course is not for you for some reason!

First Day of Fall Classes:	Mon. Aug 23
Last Day to Submit Domicile Reclassification Application	Mon. Aug 23
Last Day to Add: All Individual Sections Forms Due	Mon. Aug 30
Labor Day : University Closed	Mon. Sept 6
Last Day to Drop: With 100% Tuition Refund	Tues. Sept 7
Last Day to Drop: With 50% Tuition Refund	Tue. Sept 14
Unrestricted Withdrawal Period: 100% Tuition Liability	Wed. Sept 15 - Mon. Sept 27
Fall Break (Classes Do Not Meet)	Mon. Oct 11
Monday Classes/Labs Meet (Tuesday Classes Do Not Meet This Week)	Tue. Oct 12
Mid-term Evaluation Period: 100-200 level classes - Grades Available via PatriotWeb	Mon. Sept 20 - Fri. Oct 15
Selective Withdrawal Period - Undergraduate Students Only **(100% Tuition Liability)**	Tue. Sept 28 - Wed. Oct 27
Incomplete Work from Spring/Summer 2021 Due to Instructor	Friday, October 22
Incomplete Grade Changes from Spring/Summer 2021 Due to Registrar	Friday, October 29
Thanksgiving Recess: No Classes (University Closed Nov. 24-28)	Wed. Nov 24 - Sun. Nov 28
Dissertation/Thesis Deadline	Fri. Dec 3
Last Day of Class	Sat. Dec 4
Reading Day(s): Reading days provide students with additional study time for final examinations. Faculty may schedule optional study sessions, but regular classes or exams may not be held.	Mon. Dec 6 -Tue. Dec 7

Students with Disabilities: Please contact The Office for Disability Services (SUB I, Suite 2250, Phone 703-993-2474, http://ods.gmu.edu if you have a learning or physical disability that will require accommodation in this course. You must obtain the proper paperwork and notify an instructor in advance to be accommodated.

Academic Integrity:
GMU is an Honor Code university (http://oai.gmu.edu/honor-code/masons-honor-code/); 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.

You may discuss your ideas with others and conference with peers on drafts of the work; however, it is not appropriate to give your paper to someone else to revise. You are responsible for making certain that there is no question that the work you hand in is your own. If only your name appears on an assignment, I expect that you have done the work yourself, fully and independently.

GMU Email Accounts: Students must use their Mason email accounts to receive messages related to this course. See http://masonlive.gmu.edu for more information.

USEFUL CAMPUS RESOURCES:

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

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

GRADED ELEMENTS: Grading for ASTRO 111 DE is based on a point system. See the table below for the point range needed for each letter grade. Each will you will have a quiz and one or two other options (a journal or discussion question or at-home assignment).

There are extra points available, so that if you choose, for example, to skip a discussion question, you can make up for it by completing an additional journal response. There is no extra credit in this course since you have ample opportunities to raise your point total. You can't get an A in the course by completely ignoring any one element, but there is some flexibility.

You also have a choice of doing a final exam based on material similar to the quizzes, or a project. The project is due two weeks before the end of the semester. The final is comprehensive and will be given during final exam week.

ELEMENT	SCORING	POINTS PER SUBMISSION	TOTAL POSSIBLE POINTS
JOURNAL	10 writings submitted on Blackboard and graded on completion.	10	100
DISCUSSIONS AND AT HOME INVESTIGATION	10 discussions or at-home investigations. These are scored on completeness and scientific accuracy.	20	200
QUIZZES	14 Weekly quizzes done outside of class	10	140
PROJECT OR FINAL EXAM	Project is due two weeks before the end of the semester. Alternatively, you can substitute a comprehensive exam given during finals week	100	100
TOTAL POSSIBLE *(note that there are extra points in some categories. You must do the project or the final exam. Otherwise you have some choice about what to complete just be sure you have done enough assignments for the grade you are aiming at!).*			540

GUIDELINES FOR JOURNAL WRITINGS:
Journal writings should be 250 to 500 words. I will assign points based on criteria such as these:

- Relationship to the material studied
- Scientific reliability (included sources cited when necessary)
- Evidence of engaged thought (no direct copying from your sources, I want your ideas, not regurgitated facts)
- Creativity and deep thought (perhaps beginning with a question "Why did gas giants get so many rocky moons if rocky planets are thought to form close to the Sun?)

I am looking for you to read astronomy with a questioning, scientific mind….what does it mean? How do they know? How could you measure that? Evidence of this kind of thought will produce full credit journal entries.

DISCUSSIONS AND AT-HOME INVESTIGATIONS
Discussions are intended to let you think more deeply about a topic and interact with each other. These are graded on both your first post and how you interact thoughfully with other participants in the discussion. Please go beyond simply agreeing or disagreeing, but offering more depth and insight into the topic discussed.

At-home investigations give you a chance to do some investigating on your own. These are not labs, nor do they replace the lab experience, but should help you to deepen your understanding of the topics. Many of them are just plain fun to do, though they will require time and sometimes simple materials found at home.

LECTURE MATERIALS: You will have a reading from the OpenStax Astronomy book each week. In addition you will find supplementary materials and your quizzes on Blackboard. The quizzes are to be completed by Tuesday night and are based on the readings and supplementary materials.

PROJECT: You have two possibilities.

1. Create a detailed biography of an astronomer who is not profiled in most text books. This is a chance to see what is going on in astronomy today and a chance to find an astronomer you identify with based on the person's country of origin, race, gender identity, ethic identity, connection because of a topic of interest, etc. There will be a journal entry along these lines early on, so you can use that as a starting point for a longer writing if you choose this path.

2. Select a topic in solar system astronomy of interest and research it beyond the text perhaps by reading and citing current original research. An example might be to write about current goals for solar system exploration, perhaps citing current NASA roadmaps, or discuss current findings about Jupiter based on the Juno orbiter.

For either possibility you have a variety of possibilities for presentation. While a straightforward writing is possible, it can be much more engaging and interesting to create a podcase, a narrated powerpoint or a video about your topic. If you want to create something else, a work of fiction, poetry, music, art, a play, or a lesson plan, contact me, I am open to that as well if it is well done.

Start early, the due date comes two weeks before the end of the semester!

FINAL EXAM:
Comprehensive and based on material similar to quiz material. Given during final exam week

Letter Grade	Points needed
A	465 - 500
A-	450 - 464
B+	435 - 449
B	415 - 434
B-	400 - 414
C+	375 - 399
C	350 - 374
C-	335 – 349
D	300 - 334
F	Below 300

Tentative schedule – subject to change! Quizzes due Tuesday night of the week they are assigned.

Week	Reading assignment from Open Stax textbook	Main ideas covered this week
Aug 25- 31	Chapter 1: Science and the Universe	-Introduction – What is a solar system? -Overview of our solar system
Sept 1–7	Chapter 4: Earth, Moon, and Sky	-Learning the night sky -Seasons and apparent motion of objects in the sky
Sept 8- 14	Ch. 7: Other worlds: An introduction to the Solar system	-Overview of planets in the solar system and their origin -Composition and structure of planets
Sept 15 - 21	Chapter 2: Observing the Sky, Birth of Astronomy	-Motion and apparent motion in the sky -Sorting out what makes science different
Sept 22– 28	Chapter 3: Orbits and gravity	-Kepler's Laws -Newton's laws of motion -Newton's law of gravitation
Sept 29 – Oct 5	Chapter 5: radiation and spectra	-The behavior of light -The electromagnetic spectrum
Oct 6– 12	Ch. 6 astronomical instruments	-Telescopes -Radio telescopes -Space based telescopes
Oct 13 - 19	Ch. 8 Earth as a planet	-Earth geology -Earth's atmosphere
Oct 20– Oct 26	Ch. 9 Cratered worlds and Ch. 10 Earthlike planets	-Moon and Mercury -Venus and Mars
Oct 27 -Nov 2	Ch. 11 The Giant planets	-Giant planet overview -Atmospheres of giant planets
Nov 3- 9	Ch. 12 Rings, Moon and Pluto	-Rings and moons -New Horizon mission to Pluto
Nov 10 - 16	Ch. 13 Solar system Debris	-Collisions! -Comets and meteorites
Nov 16	Project due	Submit project on time!
Nov. 17 –23	Ch. 14 Cosmic samples and the origin of the solar system	-Exoplanets -Modified theory of solar system formation
Nov 24– 28	Thanksgiving break – submit missing work	All missing work due on December 4

Dec 9 -11	**Comprehesive Final Exam on-line for those who chose not to do the project**	**I will not accept ANY work except the final after after Dec 4**