# Astronomy 1115 Syllabus

Section: 501

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| Instructor: | Jose Sanchez |
| Email: | jsanchez1819@unm.edu |
| Microsoft Teams Link: | Click Here |
| Office Hours: | Wed, Fri, Sat 6:30 pm – 8:00 pm |
| Website: | Click Here |

## Introduction

Hello and welcome to Astronomy 1115. This course is taught online. The class will meet 2.5 hours per week on a schedule that will be mostly determined by you and your fellow classmates. It will consist of weekly lectures, homework assignments, and labs. There will be quizzes and exams as well. The class will cover a wide range of topics in astronomy including, but not limited to, the Earth, Moon, stars, our solar system, telescopes, the physics of astronomy, the Sun, space, galaxies, black holes, the life cycle of stars, the origin of the universe, and the search for life in the cosmos. I reserve the right to change/update this syllabus as needed and I will do my best to inform you of any changes that occur. I look forward to a productive semester and I will do my best to present the material in a clear, concise, and hopefully interesting manner.

## Textbook & Planetarium Software

The textbook is **free** online from *OpenStax.org* and you can download it here.

From time to time we may be using a **free** planetarium software package as well. It is from *Stellarium* and you can download it to your computer or use it directly from the web by clicking here.

## Course Policies

- This class will be solely taught online. On the first day of class the students and myself will have a discussion on what days of the week and times the lecture should be held.
- No late homework will be accepted. You will have one week to complete the homework assignments. Only under dire circumstances will I consider homework to be turned in late and it must be supported with official documentation.
- Exams and quizzes will be held in class at the start of the class period. 20 minutes will be given for a quiz, 1.5 hours for exams, and 2 hours for the final.
- Please be respectful of myself (Mr. Sanchez) and other students. No bullying of any kind will be tolerated.
- I am respectful to all races, genders, sexual orientations, gender identities, and religious beliefs. Please inform me if you self identify as anything other than the standard gender pronouns.

- Covid-19: Please follow any local social distancing, mask wearing, hand-washing, and quarantine rules that are in place. We follow these rules not only to protect ourselves, but also everyone, especially those individuals that are at a higher risk of severe symptoms from this global pandemic.
- If at any point that I have failed to reasonably accommodate you or your situation, please reach out to me via email (jsanchez@1819@unm.edu) and we can work together to solve the situation.
- Learning should be enjoyable. I will do my best to educate you on all things astronomy and make the course an interesting and enjoyable experience.

# Course Objectives

By the end of this course you will be able to discuss and understand the following topics:

- The night sky as observed from Earth
  - Coordinate systems
  - Apparent daily and yearly motions of astronomical objects
- The scientific method
- The scale of the solar system, galaxies, and the universe
- Telescopes and telescope designs
- Continuous, absorption, and emission line spectra and how they apply to astronomical objects
- Solar system objects
- Models describing the formation of our solar system
- Gravity, electromagnetism, and other physics related topics that can be used to describe the universe
- The discovery of exoplanets and how they are discovered
- The Sun
  - structure
  - the source of its power
  - solar activity and its effects on the solar system
- The life and death of stars
  - solar life cycles
  - Hertzsprung-Russell diagrams
  - white dwarfs
  - neutron stars
  - black holes
- The structure and formation of galaxies and galaxy clusters
- The origin of the universe
  - the Big Bang
  - expansion
  - evolution up to present day
- The search for life beyond the Earth

# Grading

**HOMEWORK 30%:** There will be one weekly homework assignment that will cover the week's course material. It will consist of questions directly related to the lecture and book readings. These homework assignments will be designed to help you understand the material and prepare you for the quizzes and exams.

**QUIZZES 20%:** There will be a quiz every other week as shown on the course schedule below. The quiz material will be based on the previous two homework assignments as well as the previous two weeks of lecture instruction. I reserve the right to add any material that I chose from material covered up to the quiz date as I see fit. To be prepared for the quiz make sure you understand and can apply the homework assignments as well as have understood the previous lectures.

**EXAMS 30%:** There will be four exams that will assess your understanding of the material. Understand the homework, quizzes, and lectures leading up to an exam and you will be well prepared.

**FINAL EXAM 20%:** There will be a cumulative final exam.

# Course Schedule

| Week | Date(s) | Book Chapter(s)/Reading(s) | Homework & Due date | Quizzes | Exams |
|---|---|---|---|---|---|
| 1 | Aug 17-21 | Ch. 1 & Ch. 2 | | | |
| 2 | Aug 24-28 | Ch. 3 & Ch. 4 | HW1, Aug 24 | | |
| 3 | Aug 31-Sept 4 | Ch. 5 & Ch. 6 | HW2, Aug 31 | Quiz 1, 8/31 | |
| 4 | Sept 7-11 | Ch. 7 & Ch. 8 | HW3, Sept 7 | | Exam 1, 9/7 |
| 5 | Sept 14-18 | Ch. 9 & Ch. 10 | HW4, Sept 14 | Quiz 2, 9/14 | |
| 6 | Sept 21-25 | Ch. 11 & Ch. 12 | HW5, Sept 21 | | |
| 7 | Sept 28-Oct 2 | Ch. 13 & Ch. 14 | HW6, Sept 28 | Quiz 3, 9/28 | |
| 8 | Oct 5-9 | Ch. 15 & Ch. 16 | HW7, Oct 5 | | Exam 2, 10/5 |
| 9 | Oct 12-16 | Ch. 17 & Ch. 18 | HW8, Oct 12 | Quiz 4, 10/12 | |
| 10 | Oct 19-23 | Ch. 19 & Ch. 20 | HW9, Oct 19 | | |
| 11 | Oct 26-30 | Ch. 21 & Ch. 22 | HW10, Oct 26 | Quiz 5, 10/26 | |
| 12 | Nov 2-6 | Ch. 23 & Ch. 24 | HW11, Nov 2 | | Exam 3, 11/2 |
| 13 | Nov 9-13 | Ch. 25 & Ch. 26 | HW12, Nov 9 | Quiz 6, 11/9 | |
| 14 | Nov16-20 | Ch. 27 & Ch. 28 | HW13, Nov16 | | |
| 15 | Nov 23-27 | Ch. 29 | HW14, Nov 23 | Quiz 7, 11/23 | |
| 16 | Nov 30-Dec 4 | Ch. 30 | HW15, Nov 30 | | Exam 4, 11/30 |
| 17 | Dec 7-11 | Study for Final | Study for Final | Study for Final | Final TBA |

# Office Hours

Attending office hours will be the key to your success in this course. I will gladly answer any questions you may have related to the assigned material. Please attend my office hours early and often.

# Learning Outcomes

The following are the learning outcomes for this course. These are taken directly from the New Mexico higher education department (NMHED). You can click here to find them on the NMHED's website as well.

1. Students will discuss the night sky as seen from Earth, including coordinate systems, the apparent daily and yearly motions of the sun, Moon, and stars, and their resulting astronomical phenomena.
2. Students will list and apply the steps of the scientific method.
3. Students will describe the scale of the Solar System, Galaxy, and the Universe.
4. Students will explain telescope design and how telescopes and spectra are used to extract information about Astronomical objects.
5. Students will describe the formation scenarios and properties of solar system objects.
6. Students will describe gravity, electromagnetism, and other physical processes that determine the appearance of the universe and its constituents.
7. Students will describe methods by which planets are discovered around other stars and current results.
8. Students will describe the structure, energy generation, and activity of the sun.
9. Students will compare our sun to other stars and outline the evolution of stars of different masses and its end products, including black holes.
10. Students will describe the structure of the Milky Way and other galaxies and galaxy clusters.
11. Students will describe the origin, evolution, and expansion of the universe based on the Big Bang Theory and recent Astronomical observations.
12. Students will describe conditions for life, its origins, and possible locations in the universe.

# Students with Disabilities

Qualifying students with disabilities should contact me immediately so proper accommodations can be arranged. My faculty responsibilities include:

- Being open to accommodating students.
- Providing program access.
- Meeting with students to discuss their needs.
- Implementing reasonable accommodations.
- Maintaining confidentiality.

# Title IX Statement

Title IX prohibitions on sex discrimination include various forms of sexual misconduct, such as sexual assault, rape, sexual harassment, domestic and dating violence, and stalking. Current UNM policy designates instructors as required reporters, which means that if I am notified (outside of classroom activities) about any Title IX violations, I must report this information to the Title IX coordinator. If you or someone you know has been harassed or assaulted and would like to receive support and academic advocacy, there are numerous confidential routes available to you. For example, you can contact the Womens Resource Center, the LGBTQ Resource Center, Student Health and Counseling (SHAC), or LoboRESPECT. LoboRESPECT can be contacted on their 24-hour crisis line, (505) 277-2911 and online at loborespect@unm.edu. You can receive non-confidential support and learn more about Title IX through the Title IX Coordinator at (505) 277-5251 and http://oeo.unm.edu/title-ix/. Reports to law enforcement can be made to UNM Police Department at (505) 277-2241.