ASTR 101

Descriptive Astronomy

Fall 2018

Instructor: Lalith Perera email: lpperera@olemiss.edu Office hours: M, T, Th 3:00PM-4:00PM Lewis 208

Course web page: www.phy.olemiss.edu/~perera/astr101/

Welcome to ASTR 101

- This is an introductory course in astronomy.
 - Understanding working of the universe in terms of scientific (physics) principals.
 - We will discuss a wide range of topics and basic concepts in astronomy, mostly qualitatively.
- This course is not about watching and memorizing constellations.
- It is about facts not fiction.

Main topics :

- Understanding the behavior of celestial objects in the sky (naked eye astronomy)
- The historical development of astronomy.
- The physics of astronomy: matter and light, laws of motion, gravitation.
- The solar system: its origin and structure
- Stars: birth, life and death
- Galaxies and the universe: origin, structure, and evolution

Broad range of topics, you will find something fascinates you.

Prerequisites:

- No prior knowledge of astronomy, advanced science, or higher mathematics is expected.
- Only a basic knowledge in scientific facts and mathematics, mostly middle school level, is required.
 - Able to do numerical calculations, powers, square roots, percentages, read plots, graphs ...
 - Basic geometrical facts, elementary algebra
 - Most of all, an interest and enthusiasm to learn!
- Most concepts are discussed from very basics.

Textbook:

- The course is not based on a book (come to class!)
- Lecture slides will be posted on the course web page
 - Slides are detailed and self-contained: Go through them as they are discussed in class.

Homework:

- Homework assignment every two weeks.
 - Take homework seriously (14% of the final grade)
 - Not an evaluation, rather to help you to understand concepts learned in class better
 - You may discuss problems with others, get help.



- Quizzes: (14% of the final grade)
 - Weekly pop quiz covers material discussed in class.
 - Bring a scantron sheet to every class (purple #16485).

• Grading:

- In-class Quizzes 14%
- Homework 14%
- Midterm test 1 14%
- Midterm test 2 14%
- Midterm test 314%
- Final Exam......30%
- Extra credit up to 10% (better than 70% attendance required)

September 24	
October 22	
November 22	
Wednesday, December	5 7.30PM
	September 24 October 22 November 22 Wednesday, December

- A 90 and above
- A- 85 to 90
- B+ 80 to 85
- B 75 to 80
- B- 70 to 75
- C+ 65 to 70
- C 60 to 65
- C- 55 to 60
- D 50 to 55
- F below 50

No make-up quizzes.

Make uo tests only for one mid term test in case of a serious illness for students in good standing. A valid doctors note is required.

Extra Credit

- There will be some extra credit opportunities to improve your grade:
 - Observational or creative work related to astronomy ...
 - Building stuff, software, animation, photography, painting ...
 - Literature survey and writing essays/papers
 - Guidelines on the course web page
- Up to 10%
- You have to be in good standing (attendance, homework) to be eligible for extra credit work.
 - Extra credit is to help students who made a genuine effort to learn but unable achieve their goal, not for those intentionally ignore work.

Good attendance, conduct and active participation would be rewarded.

Extra credit work is only for students in good standing (70% attendance, done homework, quizzes...)

This won't work:

Examples from from student with over 20 absences, missed homework, quizzes

After reviewing the midterm grades, I noticed my grade was below 30. What can I do in order to pass this course? I am scheduled to graduate this may and have already accepted a job that I would be starting in May.

I just spent a lot of time on those papers and thought it would bring some benefits. I had a long semester of 2 deaths in the family, I had the flu, walking pneumonia, and tonsillitis twice. I don't mean to make excuses but I fought just to get through this semester and did everything in my power just to pass. I understand the syllabus but I just was really hoping after all I went through and how hard I pushed just to get anything about an F.

I thought I got a chance to raise my test grades off my extra credit. I can't have that low of a grade. I won't get to keep my scholarships

Attendance:

Regular attendance is required - excessive absences will affect your grade.

- Course is not based on the book
- Graded quizzes during class.
- Many demonstrations and other visual aids in class

Conduct in the class:

- Come on time, scan your ID, stay until the end (quizzes anytime during class).
 - Leaving class after scanning your ID is cheating!
- Pay attention, ask questions.
- Do not do anything (reading, talking, walking) which distract yourself or others
 No cell phone or laptop use. Mute your phone.

ASTR 101 grades (last 3 semesters)





View of the Milky way from the dark site

- There will be few observing sessions
- Depends on the weather (highly unpredictable in MS).
 - may have to arrange outside class hours.
 - Take advantage whenever there is an opportunity.
 - it is a rewarding experience, an essential part of learning astronomy.
- We also have a dark site about 13 miles away.



There is a monthly open house at the Kennon observatory. You are invited.



Guidelines for Success

- Do not take it lightly:
 - Even though it is a 100 level course and not your major you have to learn the subject material with similar effort you put in for any other course.

• It is not possible to learn everything the day before the test.

 This is a science course, emphasis on understanding, not memorization, a slow and gradual process taking time.

Keep up with the material as it is discussed in class.

- Come to class, pay attention, engage: ask questions.
- Go through the review questions and slides after each lesson.
- If you do not understand anything ask for help, stay with what you learn, do not fall behind.
- Peer discussions are encouraged, ask your class mates, share your knowledge.
- Do homework on time, attend observation sessions.



Why study astronomy?

- "Astronomy" form Greek words astron (star) and nomia (law) "laws of stars".
 - Those days it was about studying the movement of stars in the sky.
- Today astronomy is a broad subject studying the physics of celestial objects (universe):
 - From the solar system to stars, galaxies and the universe as a whole
 - Their structure, properties, beginning and evolution

Why study astronomy?

- Oldest of the sciences with a rich history and cultural element.
- Gives us deep insights into our existence and our place in the universe.
- Astronomy is not a stand-alone subject. It combines knowledge from many fields
 - This course will cover broad range of topics in many areas of science.
 - With an emphasize on their relevance to things you see or experience everyday.
- Astronomy has been an integral part of a well-rounded education for centuries.
 - In medieval universities students had to complete seven subjects of liberal arts as preparatory work for the serious study (of philosophy and theology).
 - The trivium: grammar, logic, and rhetoric.
 - The quadrivium: arithmetic, geometry, astronomy, and music.
- Today astronomy is more relevant to us than ever before.





Andromeda Galaxy (10¹² stars)

Virgo cluster of Galaxies over 1000 galaxies

- Tells us about our place and time in this vast universe
- Gives deep insights about us, our existence
- And an appreciation for what we have and the importance of protecting them



• Night sky is a magnificent and fascinating sight.

Betelgeuse a red supergiant star (star near the end of its life)

> Aldebaran a red giant star

Venus

Sirius: brightest star in the night sky, has a while dwarf companion.

(an end state of a star very dense - a table spoon over 1 ton) Orion nebula (a stellar nursery) open star cluster: Hyades Pladies an open star cluster

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With what you learn you will find another level of fascination in the sky. A deeper understanding of what you see.







Universe Is Dying, Galactic Survey Shows May 5 Alignment: Doom, Dream or Dullsville?

AUG 10, 2015 04:00 PM ET // BY IRENE KLOTZ



May 5 marks the date of the Grand Planetary Alignment that, depending on whom you listen to, will either cause worldwide catastrophe, bring global human enlightenment or... nothing at all. Here's the bad, the good and the same ol'-same ol'.





On this page: The significance of all zodiac signs, with regards to

Bright Lights, Strange Shapes and Talk of U.F.O.'s

By JONAH BROMWICH NOV. 12, 2015

Venus Retrograde

Astronomy makes popular 'news stories':

- Genuine news as well as much misinformation and nonsense is spread quite often by news media
 - Most science fiction is about space travel and exploring other worlds
- What you learn will help you to evaluate their validity, enable deciphering facts from myths, truth from lies.

Course web page www.phy.olemiss.edu/~perera/astr101



planets forming in HL-Tauri: from ESO

Useful Links

Astronomy animations

Animations shown in class can be found here.

Observing:

- Sky and Telescope, observing news
- <u>S&T this week's sky at a glance</u>
- SpaceWeather observing and news

	ASTR 101
	DESCRIPTIVE ASTRONOMY
	Fall, 2018
INSTRUCTOR	Dr. Lalith Perera
LOCATION and TIME	101 Lewis Hall, MW 7:00-7:50PM and F 12:00-12:50PM
OFFICE HOURS	M,T,TH 3:00-4:00PM or by appointment
OFFICE	Lewis 209
EMAIL	lpperera@olemiss.edu
COURSE DESCRIPTION	This is an introductory one semester course in astronomy for non-science majors. Main objective of the course is to understand the working of the universe in terms of scientific principals. Physical concepts, as they relate to astronomy, as well as their historical development are discussed. There is no laboratory work, but there will be opportunities for observations.
PREREQUISITES	No prior knowledge of astronomy or advanced science is required. A basic knowledge of some scientific facts and mathematics (no more than middle school level) is expected. A keen interest in learning astronomy and willingness put forth the required effort is the best prerequisite.
COURSE OBJECTIVES	After successful completion of the course students are expected to have a basic understanding and feeling about our place in the universe, its scale, constituents, structure and physical principals and processes governing it. They are expected to achieve a better understanding of how science works and have a good enough grasp of the fundamental concepts to follow articles on astronomy in the popular press and be able to evaluate their scientific merits or flaws.
TEXTBOOK and SUPPLEMENTARY READING	The course is not based on a text book (so important to come to class). Lecture slides will be posted on this web page before the class, In addition, links to various online resources will be posted as supplementary learning material. A list of suggested books for supplementary reading is given here

- All information you want to know about the course is posted on the course web page.
 - Course policies, exam dates, syllabus
 - Lecture slides, homework, test results and grades.
 - Links to other resources

ASTR 101 Facebook page www.facebook.com/ASTR101



- Many astronomy related news and articles from magazines and other media pages.
- You are encouraged to subscribe and get updates on current news and events in astronomy.

- Learn with a keen interest, not just trying to fulfil requirement easiest possible way
- In many ways what you learn will be relevant, fascinating and useful regardless of your major or future career.
- Many ways to connect and enjoy. Astronomy is one of the most fascinating subject you will encounter in your academic life.

Think of this course as a guided tour:



- Enjoy the trip as well as reaching the destination.
- Like road trip along a scenic road
- Enjoy the journey, look around, learn and preserve some memories for later enjoyment.

Lets begin the journey!

and for the series