

Astronomy – 2016-2017
Mr. Lee – Rm. 138
leeas@fultonschools.org



Text: *"Foundations of Astronomy", Michael Seeds, 2007*

Course Description: This course is a survey course in the introduction of Astronomy. It is designed to introduce the interested student to the following concepts: measurement and motion throughout the universe, the moon, the solar system, the sun, the stars, the milky way, galaxies, other universal objects, cosmology. Upon completion of this course students should have a better appreciation and understanding of the cosmos around us.

Standards Covered Fall Semester:

Unit One Standards:

Standard: SAST1. Students will explain the tools used by astronomers to study electromagnetic radiation to determine composition, motions, and other physical attributes of astronomical objects.

Standard: SAST3. Students will describe and explain the celestial sphere and astronomical observations made from the point of reference of the Earth.

Standard: SAST4. Students analyze the dynamic nature of astronomy by comparing and contrasting evidence supporting current views of the universe with historical views.

Unit One Elements:

- Explain the challenges faced by astronomers due to the properties of light and the vast distances in the cosmos.
- Describe how latitude and time of the year affect visibility of constellations.
- Explain the relevance of experimental contributions of scientists to the advancement of the field of astronomy.

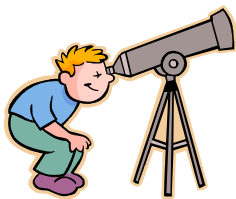
Unit Two Standards:

Standard: SAST1. Students will explain the tools used by astronomers to study electromagnetic radiation to determine composition, motions, and other physical attributes of astronomical objects.

Standard: SAST3. Students will describe and explain the celestial sphere and astronomical observations made from the point of reference of the Earth.

Unit Two Elements:

- Evaluate the types of telescopes used by astronomers for examining different frequencies of electromagnetic radiation and compare and contrast the uses and advantages of each (e.g. radio, visible, gamma ray, reflector, and refractor).
- Mathematically apply Newtonian gravity to celestial bodies to determine their masses and explain their motion (e.g. Kepler's Laws)
- Discuss how spectroscopy provides information about the inherent properties and motions of objects.
- Quantitatively analyze data from telescopes (e.g. spectra, multi-wavelength photometry, and images) and/or other astronomical sources (e.g. tide tables, sky charts).
- Evaluate the effects of the relative positions of the Earth, moon, and sun on observable phenomena, e.g. phases of the moon, eclipses, seasons, and diurnal cycles.
- Predict visibility of planets (major and minor) in the solar system based on relative orbital motion.



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Standards Covered Spring Semester:

Unit Three Standards:

Standard: SAST2: Students will describe the scientific view of the origin of the universe, the evolution of matter and the development of resulting celestial objects.

Standard: SAST4: Students analyze the dynamic nature of astronomy by comparing and contrasting evidence supporting current views of the universe with historical views.

Standard: SAST5: Students will evaluate the significance of energy transfers and energy transformations in understanding the universe.

Unit Three Elements:

- Outline the main arguments and evidence in support of the standard cosmological model. (e.g. elements, solar systems, and universe)
- Compare and contrast the major properties of the components of our solar system.
- Explain the relevance of experimental contributions of scientists to the advancement of the field of astronomy.
- Relate nuclear fusion reactions and mass-energy equivalence to the life cycle of stars.
- Explain the relationship between the energy produced by fusion in stars to the luminosity.
- Analyze the energy relationships between the mass, power output, and life span of stars.
- Describe energy transfers and transformations associated with the motion and interactions of celestial bodies (e.g. orbits, binary, pulsars, meteors, black holes, and galaxy mergers).

Unit Four Standards:

Standard: SAST2: Students will describe the scientific view of the origin of the universe, the evolution of matter and the development of resulting celestial objects.

Standard: SAST4: Students analyze the dynamic nature of astronomy by comparing and contrasting evidence supporting current views of the universe with historical views.

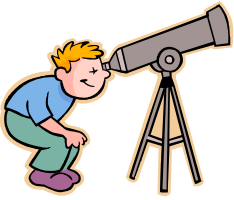
Standard: SAST6: Students will explore connections between cosmic phenomena and conditions necessary for life.

Unit Four Elements:

- Compare and contrast the major properties of the components of our solar system.
- Evaluate the impact that technological advances, as an agent of change, have had on our modern view of the solar system and Universe

This year the state of Georgia has begun to implement new standards called Common Core standards. These include literacy (reading and writing) standards for the sciences. This will mean an intentional effort to improve both your reading and writing skills particularly in science and scientific thinking. This link will take you to them:

https://www.georgiastandards.org/Common-Core/Documents/CCGPS_11-12_SS-Science-Tech-Literacy_Standards.pdf



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Classroom Expectations:

- 1) Come to class on time, prepared, and ready to learn.
- 2) Bring all needed materials to class
- 3) Be in your seat and ready to work when the bell rings.
- 4) Respect and be polite to all people
- 5) Treat others as you would like to be treated.
- 6) Listen and stay seated when someone is talking
- 7) Food and canned/bottled drinks are not to be consumed in the classroom.
- 8) Respect other people's property.
- 9) Obey school rules.

Tardy Students: Students arriving tardy to first period by more than 10 minutes must check-in through the Attendance Office, then report to class. Students tardy to periods two through six are to report directly to class. Below are the consequences for repeated tardiness to a particular class in any six week grading period. You are to be in your seat when the bell rings.

- First Tardy – verbal warning
- Second Tardy – 1 day private detention with teacher
- Third Tardy – one day public detention
- Fourth Tardy - two days public detention
- Fifth Tardy – one day Saturday School
- Sixth Tardy – multiple days of Saturday School



Student Participation:

Students are expected to pay attention and contribute to class activities. This includes taking notes. Do not sit in the class and try to soak up what I have to say. Science is about asking questions and discovery! Tell me what you think, let me know you are alive, and most important do not be afraid to ask “why”. Just because I say something doesn't always mean it is true or right. If something does not seem right, point it out to me then. Good participation can be very effective towards a borderline grade.



Required Supplies: 3-ring binder, textbook, paper, pencil, scientific calculator, colored pencils, metric ruler, protractor, and a highlighter.

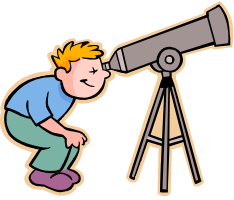
Honor Code: As explained in the student handbook, cheating is defined as “the giving or receiving, in any form, information relating to a gradable experience.” Violations of the honor code will result in a zero for the assignment, plus an honor code violation form placed in the student's disciplinary file. Read the handbook carefully to fully understand what constitutes a violation.

Seating Chart: Every student will be assigned a place to sit in the class. Assigned seats may be changed by the teacher, if the need arises. Exceptions will be made if the parent writes a note to the teacher, explaining the student's special needs.

Grading Procedure:

Unit Tests and Summatives: **40%** Quizzes: **30%** Labs and Projects: **10%** Final Exam: **15%** Homework: **5%**

Late Work Policy: Late work will receive a 20% penalty for each day the assignment is late.



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Recovery Policy:

Recovery is for students who, despite a conscientious effort and communication with their teachers, have failed to demonstrate satisfactory understanding of course goals. It is not for the student who has been failing for many weeks and then wishes to recover during the final days of the course. Opportunities for students to recover from a 74 or below cumulative average will be provided when all work required to date has been completed and the student has demonstrated a legitimate effort to meet all course requirements. Students who have not attempted to complete all course requirements are not eligible for recovery.

Students may initiate recovery on major assessments starting with the second major assessment of the semester as long as they have made a legitimate effort to meet all course requirements including attendance. Unexcused absences may prevent this opportunity.

So that students stay focused on the content at hand and don't become overwhelmed and fall too far behind, they must initiate recovery on a major assessment within five school days of being informed of the grade on that assessment. Recovery work must be completed within ten school days prior to the end of the semester. The nature and type of recovery assignment is given at the discretion of the teacher.

Parent Communication: Home Access Center allows parents/guardians to access their children's school information via the Internet. By signing up over the web and coming to school to receive a user name and password, parents can see the assignments, grades, attendance, and school information. The best way to reach me is by email. My email address is: leeas@fultonschools.org

Makeup Work Policy:

Make-up work should be obtained on the day the student returns to school. Students have the same number of days to complete make-up work as the absence. This does not include the day of return. Tests and labs will be made-up before or after school as scheduled and within a reasonable time period from the date of the absence.