**General Syllabus/Course outline – Astronomy**

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**General Astronomy Course Description – GA standards** This course will provide the student with an introduction to the concepts of modern astronomy, the origin and history of the Universe and the formation of the Earth and the solar system. Students will compare the Earth's properties with those of the other planets and explore how the heavens have influenced human thought and action. The course gives a description of astronomical phenomena using the laws of physics. The course treats many standard topics including planets, stars, the Milky Way and other galaxies, black holes to more esoteric questions concerning the origin of the universe and its evolution and fate. Although largely descriptive, the course will occasionally require the use of sophomore-high level mathematics. Laboratory exercises include experiments in light properties, measurement of radiation from celestial sources, and observations at local observatories and/or planetariums.

**General Requirements:** Algebra I & II (or higher preferred), Physics

**Course Grading:**

* **20% classwork (HW, labs, movie reviews, computer work – etc.)**
* **20% Projects**
* **15% Quizzes**
* **25% Unit Tests**
* **20% Comprehensive Final**

**Course Materials:**

Notebook + 2 pocket folder

Pen/pencil, colored pencils

\*\* Compass & protractor, colored paper + art supplies

**Reading/Learning Center**

There will be a small learning setup near the front of the room consisting of text books, scientific journals, astronomy/science/physics books (including biographies, history of science – etc.) and assorted magazines. These are for various projects and enrichment/extra credit assignments and are available for short (2 week) checkout. To get ***CREDIT*** for these assignments, all books, journals and magazines ***MUST*** be returned in ***their original condition!*** (No damage, missing pages, markings/underlining – etc. )

A list of topics will be given out in class.

**General Course Outline Timeframe – main units to be covered**

* **Introduction to Astronomy (3 weeks)**– ancient history, cosmology models, basic concepts – math (metric system, scientific notation), time, the calendar, lunar phases, orbits, gravity, eclipses, tides, the zodiac, constellations (not just Greco-Roman).
* **Tools of Astronomy (3 weeks) –** Review of theElectromagnetic Spectrum, Optics & telescopes, Emission, Adsorption Spectrum, history of space exploration
* **The Solar System and Exoplanets (4 weeks)** – Earth/Moon system as a Model, Inner Terrestrial Planets, Outer Gas Giants, Minor Planets and Asteroids, Comets & meteorites, Models of Formation, Exoplanets **–** search for, types, models – astrobiology
* **The Sun, Stellar Evolution (4 weeks)** – Origin/evolution of the Solar system & Sun, nuclear processes, role of gravity and mass in evolution
* nuclear reaction types, mass/gravity relationships relationship with stellar evolution star brightness and lifespan.H-Rdiagram,stellar birth and death, planetary nebula, variable stars, exotic stars (white dwarves, neutron stars, black holes). Life span of stars – etc.
* **Galaxies and Galactic Evolution (2 to 3 weeks)** – History of Observation, Hubble Classification, Types of Galaxies, role of black holes in their formation
* **General Cosmology (1 week) –** Hubble’s Law,Ether,Big Bang theory, GUT, String Theory, Dark matter & Energy, The Big CRUNCH and the Big RIP
* **Life in the Universe? (1 week)** - Search for life on other worlds. Solar system candidates, exoplanets, Drake equation, SETI – etc.
* **Procedures:**
* \* All assignments must be turned in to the correct location. Your name must be on the assignment to earn any credit. Assignments left randomly on my desk are likely to be lost at no fault of mine.
* \* All failed tests and quizzes except the final can be retaken for a better grade.
* \* Assignments are due at the end of class. If you did not finish, you may take it home, and it will be due at the beginning of the next class. All work turned in after that will lose 10% per day it is late.
* \* Cheating/copying will not be tolerated. Anyone who turns in work that has been copied or cheated on will cause all parties involved to receive a seriously reduced grade if not just a zero.
* \* Lecture and notes will happen most days. You are responsible for taking notes.
* \* Warm ups will sometimes be graded; expect at least one per week to be graded.
* \* Assigned class work is expected to be performed in the class period it was assigned. Copying on individual assignments will result in a zero. Group assignments are not considered copying.
* \* I will call your parents if you are failing, disrupting and/or skipping this class
* \* If your seat needs to be adjusted you will stay in the new assigned seat until otherwise changed by me.
* \* Should I be absent on a given day you will treat the sub with respect and perform all required activities as expected.
* Rules:
* \* SUPPORTIVE: I will support learning for myself and my classmates. This means that I will be prepared to learn by being on time, having my materials, and being in my seat when the bell rings. I will help my classmates when I can, but I will not do work for them or simply give them answers. I will participate in both individual and group assignments to the best of my abilities.
* \* OPEN MINDED I will accept all types of learners. I will be positive towards my classmates, my teacher, and myself. I understand that different people need different things to be successful.
* \* ACCOUNTABLE: I will be accountable for my own learning. This means I will put my phone away, I will pay attention, I will attempt all assignments and I will be responsible for my work, so that I can turn it in on time. If my cell phone is causing me to miss explanations or instructions or distracting anyone from completing work, I will have the option of letting the teacher hold it until the end of class or I can choose to receive a phone call home to parents. If the phone call home does not resolve the problem, my teacher will turn the matter over to an administrator.
* \* RESPECTFUL: I will respect school wide rules. I MUST have a hall pass to leave the room. Dead time is observed the first 15 and last 15 minutes of the class. Abusing a hall pass by staying out longer than is necessary is rude to other people in the class and can result in my losing my hall pass privileges.