# Proposal To Setup An Astronomy Course

**Course Rationale**

Astronomy is a hands-on discovery Course subject offered that may be offerd as an Adult Ed option during the evening hours. The course will inculcate a deeper understanding of our greater surrounding - the Universe. It will also increase the awareness about our "oasis in the grand cosmic desert" and the importance of preserving it. It shall be non-mathematical in approach.

**Course Description**

The theme of the course will be **"a journey into the cosmic frontier"** based on some astronomy textbook. The current edition of such astronomy textbook along with its ancillary material will be adapted towards a term's worth of our cosmic coursework. The presenter is in the process of writing his own textbook.

**Course Objectives**

**1.** To familiarize pupils with the history of civilization in relation with the rhythm and beauty presented by the cosmic bodies.
**2.** To update students with the concept of time as established by the celestial clockwork.
**3.** To evaluate the behavior of light and other electromagnetic radiation which brings signals of the evolution of the universe.
**4.** To understand the working of optical instruments like telescopes and spectroscopes used by astronomers.
**5.** To comprehend the Earth's atmosphere, and the Earth's motions that modify cosmic data.
**6.** To identify the major structural components of the universe from the vantage point of our planet and going out in deep space.
**7.** To study the fundamental forces of nature like gravity, that make the universe happen as we know it.
**8.** To debate several theories of formation of our Earth, its Moon, Sun and Milkyway System, and the Big Bang.
**9.** To learn the nightsky in order to find one's latitude, longitude, local time, current season, eyesight keenness,, pollution amount.
**10.** To construct sundials, starclocks, telescopes, astrolabes, lat-lon & zod-mil finders as project-work from inexpensive materials.

**Course Infrastructure**

A set of about 30 students, a ventilated classroom/ lab room equipped with audiovisual capabilities and material. Planetarium/Observatory visits will be organized during the semester of 15 weeks. Topics covered as follows:

**Course Outline**

**(i)** History of Astronomy, **(ii)** Light and EM Radiation, **(iii)** Telescopes and Spectroscopes, **(iv)** the Earth's atmospheric effect, **(v)** the Earth's motions, **(vi)** the Sun's Family, **(vii)** the Milkyway Galaxy, **(viii)** Quasars and the Observable Horizon, **(ix)** Forces of Nature, **(x)** Theories of planetary, stellar, cosmic system formation, evolution, and future fate of all objects, **(xi)** Nightsky/star-map reading, & **(xii)** Construction of gadgets/projects.



**Course Units/Topics**

Based on the outline above exactly **six units & sixty topics** will be supplied at a later stage when course is ready to be implemented.

**Course Mechanics**

Lessons will be developmental with illustrations, demonstrations, and/or hands-on activity.

**Sample Unit/Topics:**

**history of astronomy ● 2 weeks (c: 3,4 & 5)**

01 Why astronomy is the mother of all sciences?
02 Who practiced astronomy in the days of yore?
03 How astronomy developed in the Greek Civilization?
04 How astronomy developed under the Arab World?
05 What is Copernicus's heliocentric theory?
06 What is Kepler's theory of planetary orbits?
07 What is unique about Galileo's observation?
08 What is gravity according to Newton and Einstein?

**Sample Unit/Topics:**

**light, em spectrum and telescopes ● 2 weeks (c: 6)**

01 How is energy, matter, and radiation one entity?
02 What is em radiation, photons, and waves?
03 What is a spectrum and its Doppler shift?
04 What is reflection and refraction of visible light?
05 How is an optical telescope useful?
06 What are the types of optical telescopes?
07 What are the limitations of the earth based telescopes?
08 What is Radio/MW/UV/IR/x-Ray/γ-Ray astronomy?

**Sample Units:**

- **earth's atmosphere and motion**
  **2 weeks (c: 1 & 2)**
- **the sun's family**
  **3 weeks (c: 7,8,9,10,11,12,13,14 & 15)**
- **stellar evolution and end products**
  **3 weeks (c: 16,17,18,19,20 & 21)**
- **milkyway, galaxies, and the big bang**
  **3 weeks (c: 22,23,24,25,26 & 27)**

**Respectfully submitted by:**

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