NATS 1311-From the Cosmos to Earth
Fall 2006

This course is a multidisciplinary study of nature expressly designed for those who have chosen not to major in the natural sciences or engineering. Early models of the solar system and the transformation to current models are examined, as are order in the universe, the nature of matter and the planets, sun, and life cycle of stars. The course is be enhanced by frequent demonstrations of the principles underlying the origin and evolution of the universe.

The students will gain an understanding of the nature of the universe and many of the underlying principles that govern its existence. They will develop an understanding of the tools that astronomers use to study the cosmos and the results of many of those investigations. In particular, they will learn about the structure of the solar system, the physics governing its evolution and structure, and the birth, life, and death of stars.

INSTRUCTOR:

- **Dr. Phillip C. Anderson 972-883-2875 — Rooms FO2.708D**
  email: phillip.anderson1@utdallas.edu

TEACHING ASSISTANT:

- **Lecture: Delilah Whittington 972-883-2867 — Room FO1.432**
  email: delilah.whittington@student.utdallas.edu

OFFICE HOURS:

- **Dr. Anderson: Tuesday/Thursday 11:00 – 11:55 PM and by appointment**
- **Ms. Whittington: Tuesday/Thursday, 12:30 – 1:45 PM and by appointment.**

TEXT:

- **The Cosmic Perspective: Bennett, Donahue, Schneider, Voit, 4th Edition**
- **Slides will be available on the web at: www.utdallas.edu/~pca015000**

  Follow the links to each class's notes(at www.utdallas.edu/~pca015000)
  They will be available at least the day before the class.

  Any movies in the notes will be separated out and put in a separate directory. They can be played with Quicktime or may be html animations that can be run through your web browser.

GRADING:

- **Exams (3)**
  - **2 Exams (Sep 21, Oct 26) @ 25% each = 50%**
    Final Exam (Nov 30 @ 8am) = 30%
    40% of the final will be comprehensive
- **Quizzes = 10%**
  - **Short quizzes may be given during any class period**
- **Homework = 10%**

ATTENDANCE WILL BE MANDATORY.

- **A seating chart will be made on the second day of class and attendance will be taken from this chart. It will be used to decide whether to raise or lower grades on the cusp.**

There will be no extra credit work available. Your grade will depend on the above evaluations.

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SYLLABUS - Fall 2006

		Chapter
1.	**Introduction -** Overview of the mysteries of the Universe Exploration of Nature, Science – A Way of Knowing Fundamental quantities Measurement units Scales of distances	1
2.	**The Sky and the Calendar** Coordinate Systems – Celestial Sphere Motions of earth – Rotation, Revolution, Precession Eclipses Time – Day, Year, Calendar, Seasons	**2/3**
3.	**The Universe – A sense of time.** Early Models of the Universe Greek Astronomers - Ptolemaic Model Heliocentric Model - Copernicus, Tyco Brahe, The Origin of Modern Astronomy Galileo, Kepler Kepler's Laws of Planetary Motion	**3**
4.	**The Material World** Particles of Matter – Atoms, Atomic Structure Atomic Spectra – Hydrogen Atom What is Inside the Atom? The Nucleus – Geochronology, Stability, Radioactivity, Fission, Fusion	**4**
5.	**Order in the Universe – Newton** Motion - Velocity, Acceleration Force, Work, Energy, Power Newton's Laws of Motion Gravity, Tides	**5**
6.	**Exploring the Universe** Waves and wave motion Electromagnetic radiation, Spectrum Light Radiation – Black Body, Planck's Law Wien and Stefan-Boltzmann Law Telescopes and Observatories	**6,7**