Astronomy 100 Sections 5 – 9
Professor Menningen

September 6, 2017

• Syllabus overview
  – books & supplies
  – course goals
  – assignments & grading
  – clickers
  – Desire2Learn

• About the professor
The Purpose of College

TRADE/TECH
SCHOOL

COLLEGE

THINK BETTER

SPECIFIC SKILLS

GET A JOB

GENERAL EDUCATION

- Communicate
- Problem solve
- Cross cultural barriers
- Know history

Bloom’s taxonomy

1. KNOWLEDGE
2. UNDERSTANDING
3. APPLICATION
4. ANALYSIS
5. SYNTHESIS
6. EVALUATION
How to Learn Astronomy

• Stay curious
• Interact with the same material several times
• Work together with someone
• Try extra homework questions
• Attend class and especially labs
How to Fail in College

- Hold beliefs that make you stupid
- Adopt shallow thinking strategies
- Never stop to ask questions
- Maintain poor study and note-taking habits
- Give up after any setback

Videos by Dr. Stephen Chew, cognitive psychologist, Samford University
How to Succeed in College

• Set a GPA goal
• Treat college like an 8 to 5 job
• Attend class
• Keep up
• Relate to your professors
• Be a "well-rounded square"
About those mobile devices

• They distract you
• They distract your neighbor
• They distract me
• They affect your professional reputation
• Self control, not external control
The Essential Cosmic Perspective

Lecture 1
Introduction &
The Night Sky
September 6, 2017
What is Astronomy?

- Study of all things outside of the atmosphere of the Earth.
  - Planets
  - Stars
  - Galaxies
  - Structure and Evolution of the Universe (Cosmology)
The Scientific Method

- Make observations
- Create an hypothesis
- Create and perform experiments to test your hypothesis
- Formulate a theory
The Constellations

- Groupings of prominent stars which appear nearby in the sky
- Includes the whole area in the sky, not just the stars
- 88 constellations
Constellation of Orion
Stars are at different distances
The Celestial Sphere

• Need a coordinate system in the sky (like latitude and longitude).

• Locations of the stars, sun and planets can be specified on the celestial sphere.

• Stars appear fixed with respect to each other.

• Sun and planets move on the sphere throughout the year.
The Celestial Sphere

- North Celestial Pole
- South Celestial Pole
- North Pole
- South Pole
- Equator
- Celestial Equator
- Polaris, the North Star
Daily Motions

• The Earth spins on its axis one time every day.
  – Causes day and night.
  – The Sun, Moon, and stars all move from east to west across the sky during the course of a day.
  – The North Star, Polaris, does not move. Its angle above the northern horizon is equal to the observer’s latitude on the Earth’s surface.
  – The stars that we can see depend on our latitude on Earth.
Observers can only see stars that are North of the Celestial Equator.

The North Star is directly overhead.

Stars will never rise or set (the stars are *circumpolar*). They appear to circle the North Star.
Observers can see all of the stars during the course of a year.

The North and South Celestial Poles are on the horizon.

All stars appear to rise and set straight up from the horizon.

None are circumpolar.
View from Northern Hemisphere

We cannot see the most southern stars on the Celestial Sphere.

Some stars will rise and set. The most northern stars will never set (they are circumpolar).
Star trails in the Northern Hemisphere

Motions of stars for part of a night. Center star is Polaris, the North Star.  

Computer Animation
Where must you stand in order to see the south celestial pole on your horizon?

A. At the south pole
B. At the north pole
C. On the equator
D. At 66.5 degrees south latitude