AST 105: Introductory Astronomy: The Solar System

Introductions - I'll go first

I am a theoretical astrophysicist, with special interests in stars and their deaths.

I have been a professor at Stony Brook for 2 years; prior to that I was a professor at U. of Colorado Boulder for 10 years.

Also a professional pianist; and lately running marathons.

Who are you...

Introduce yourself
- Name, major, interests, etc.
- Why are you taking this course?
- What topics do you most want to learn about in this class?

I'll try to get to know you throughout the semester but you can help by...
- Asking questions
- Answering questions
- Coming to see me in office hours
- Volunteering for demos
Outline of Today’s Class

• Course goals
• Course overview
• Course information
• Real astronomy

Course Goals

• Learn critical thinking skills
  • How to think, reason, and argue scientifically, using logic, observation, and evidence
• Learn why our solar system looks like it does
• Understand how we know what we know about the solar system
• Appreciate what we know about the solar system
  • and what we don’t yet know!

Course Overview:
What we will study

• Vast range of SIZES and SCALES:
  Understanding our place in the universe

How does our position here on Earth affect us and what we see?

• Celestial Motions
• Eclipses
• Seasons
• Moon Phases
What shaped the Terrestrial planets?

Why is there abundant life on Earth but no apparent life on Mars or Venus?

Why is Earth so different than Jupiter?

Why is there a debate about whether Pluto is a planet?
In What Ways Are Other Solar Systems Like Us... How Are They Different? How Do We Find Them?

Planet detections: year 1995

Planet detections: year 2016

- Radial Velocity
- Transit
- Microlensing
- Solar System

Discoveries also by Direct Imaging

Over 2000 planets discovered !!!

Energy,
Gravity,
Motion
LIGHT
Electromagnetic Radiation

- What is light?
- How do we use it to find out what and where things are?

Full electromagnetic spectrum much wider than the familiar optical

What is this course NOT?

Astronomy ≠ Astrology!!!

Who should take this course?

- No prerequisites, aimed at non-science majors
- Moderate amounts of quantitative work (algebra)
- Complementary material to AST 101 (Stars and Galaxies)

Memorizing Constellations
**Will this course have MATH?!?!?**

- **YES**
  - But not that kind!!
- Algebraic Manipulation
- Scientific Notation
- Significant Figures
- Areas
- Volumes
- Exponents

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**This class is not about memorization!!!**

- Knowledge (remembering facts and numbers) is really only the base of learning
- You need to understand the concepts of WHY and HOW.

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**Course Information**

**COURSE WEB PAGE:**
http://amalfi.astrosunysb.edu/rosalba/ast105/ast105.html

You can find announcements, reading assignments, syllabus, lecture notes and other useful things there
Required Textbook

*The Cosmic Perspective*
by Bennett et al.

Older Edition is fine, though reading assignments based on chapters from latest (7th) edition.

GRADING

**Clickers**: 10%

**Class Labs** (last 20-30min every 2-3 classes): 5%

**In-class Group Projects** (2 of them): 15%

**Midterms** (3 of them): 40%

**Final exam**: 30%

Class Labs

- Every 2-3 classes
- Consist of problems and questions on the material covered in the previous 2-3 classes
- Students work in groups of 3 and return a common write up - learn how to be a scientist, discuss opinions
- 1 class lab will be randomly selected at the end of the course and graded to count towards 5% of the total grade

In Class Group Projects

- Students work in group of 3 (similarly to the class lab) and return a single assignment with all their names.
- Groups can be chosen freely, with the only requirement that they be different between the 2 projects.

READ ALL THE INFO ON THE COURSE WEBPAGE
Clickers

- Required-- bring to each class!
- Register your clicker to your name in blackboard
- Used for reading quizzes, in-class discussion questions, feedback - favors peer learning
- Write your name on a piece of tape on the back of your clicker!

More on clickers

- Credit starts next week
- Graded 2 pts for correct answer, 1pt for wrong answer, 0 pts for no answer
- Discussion with neighbors is encouraged

Cell Phones and Laptops

- Please, no cell phone use in class (including text messaging)

- Laptops to be used for note-taking ONLY

Please take a note of the following slide, assembled with data gathered by Dr. S. Hornstein at U. of Colorado, and based on a sample of about 1,500 students in classes like AST 105.
If there was a switch you could flip that would improve your grade by half a letter, would you do it?

Welcome to a discovery of the Universe!

Come talk with us

- Prof. Rosalba Perna's office hours:
  TTh: 11:30am-1:00pm; in ESS 461
  rosalba.perna@stonybrook.edu

- TA Taeho Ryu's office hours:
  MF 10-11:20am in ESS 443B
  taeho.ryu@stonybrook.edu

- Or email (any of us) to make an appointment!

“Not everything that can be counted counts, and not everything that counts can be counted”

- Albert Einstein