Course Syllabus

ASTR 123: Galaxies and The Expanding Universe
Willamette 100
TTh 10-11:50 AM
Spring 2016
Instructor: Spencer Chang

Office: Willamette Hall 462
Office Hours: In office: W 5-6pm, F 10-11am, 3-4pm) or by appointment. Feel free to come chat about the course, my research, or anything that interests you.

E-mail: chang2@uoregon.edu

Teaching Assistants: Eryn Cook and Andrea Goering (office hours TBA)

Course Description
This Astronomy course is an introduction to galaxies and cosmology targeted towards non-science majors. Focusing on chapters 11-15 of the textbook, this course aims to introduce the amazing amount of science we have learned (and hope to learn in the future) by studying the properties of galaxies and the Universe. In fact, some of the biggest questions a human can ask will be tackled. What happened at the beginning of the Universe? How does the Universe evolve with time and what is its ultimate fate? How did the atoms that make up everything get formed? Throughout the course, not only will you learn what we know and how we know it, but also what remains unresolved and the prospects of unveiling these mysteries.

As a general science course, this course is also intended, through homework tutorials and group activities, to develop students ability to break down complicated problems and to reason/argue scientifically. Note that although this course is directed towards non-science majors, students will still be expected to analyze graphs/data and perform simple calculations. Many of these skills will be reviewed in class, but please contact me if you are concerned with these requirements.

Learning Outcomes
Through this course, students will learn:

- To understand the distance and time scales relevant to the Universe (e.g. size of galaxies, age of Universe)
- The methods of measuring distances and velocities of astronomical objects (e.g. using the Doppler effect)
- To use the force of gravity to explain galaxy/Universe dynamics and infer the amount of mass
- The status and components of the Big Bang Theory and defend/critique them using experimental observations
- The criteria for extraterrestrial life and prospects to discover them
- To analyze complex problems by applying techniques such as scaling, plot interpretation, and critically reading popular science articles

Text and other Course Requirements
The textbook for this course is "Cosmic Perspective Fundamentals" 2nd ed. by Bennett et.al. Access to MasteringAstronomy is required to complete the homeworks. Finally, a device to use Learning Catalytics (laptop, smartphone, or tablet) will be used by students to submit responses to in-class questions.

Workload
Homework assignments will be submitted online through Mastering Astronomy, the online counterpart to the textbook. Assignments will include tutorials (to hone material introduced in class), multiple choice, and more rarely numerical or short answer questions. Without a prior agreement, late homeworks will lose 5% credit each day after the deadline with a maximum penalty of 20%. (In general, please let me know as soon as possible about any issues with turning in a homework on time) Total work expected in a week will be 2-4 hours of reading, 2-5 hours on the homework, 3-4 hours of lecture/group work.

We will cover roughly 1 chapter every two weeks. Class will be a mix of lectures with slides, brainstorming/concept
test questions, and interactive group activities. On average there will be about 75 minutes on lecture-only days and the full hour and fifty minutes will be available for days with a lecture and group activity.

A major component of this course is group activities designed to teach real world applications of scientific techniques used in this course. In class, students will work in groups of 4-5 and each will turn in an assignment that teaches these concepts. There will be at least five of these assignments in this quarter and they will be graded on a 3 point scale: 3 = exceptional (100), 2 = good (95), 1 = adequate (80), 0 = poor/absent (60). As you can see, exceptional is a rarely awarded grade that is recognition of an outstanding effort.

Grading Plan

The grade will be based on the following percentages: nine homework assignments (with lowest grade dropped) (50%), the group activities (also lowest grade dropped) (40%), and quizzes/class participation (10%). I reserve the ability to adjust scores by 5% based on improved effort.

Depending on the performance of students, I reserve the right to curve the grades, which in almost all cases is done to increase the final grades for students.

Collaboration Policy

Discussion with classmates on homework is allowed and can be beneficial. However, students must submit their own work. The homework is essential to mastering the subject, thus it is more important to understand the methods than the final answers. Academic misconduct will not be tolerated. Please see the University Student Conduct Code (http://conduct.uoregon.edu) for more information.

Electronics Policy

Humans are terrible multi-taskers and thus, I encourage everybody to limit the use of technology in class to note taking, recording of lectures, and Learning Catalytics. Be aware of the distractions, technology can have on your attention and those around you.

Students with Disabilities

Please arrange a meeting with me to discuss any aspects of the course which are barriers to your inclusion. All shared information will be kept confidential.