AST 301, Introduction to Astronomy

Course Syllabus — Fall 2009

Unique Number:	49445
Lecture Time	MWF 10 – 11 AM
Unique Number:	49450
Lecture Time	MWF 11 – Noon
Instructor:	Dr. Edward L. Robinson Office: RLM 17.318 Tel: 471-3401 Office Hours: Tuesday, 1:00 - 2:00 PM Other times by appointment
Lecture Location:	WEL 3.502
Required Textbook:	"21st Century Astronomy" (Second Edition) by Hester et al.
Course Email Address:	elr301@astro.as.utexas.edu
Course WEB Site:	http://pisces.as.utexas.edu/ast301
Student-Contact TA	Sehyun Hwang Tel: 471-3466 Office Hours: Wednesday 1:00 - 2:00 PM Other times by appointment Office Hours Location: RLM 15.202 (Peridier Library)

Course Description: AST 301 is an introductory course in astronomy for non-science majors. No previous course in astronomy is required. The main topics of the course are:

- The solar system – the planets and their moons, asteroids, comets; planet formation.
- Stars and stellar evolution – star birth and the formation of planets, and star death, including neutron stars, black holes, supernovae.
- Galaxies – normal and not-so-normal galaxies, quasars and supermassive black holes, dark matter.
- Cosmology – the expansion of the universe, its origin in the Big Bang, dark energy and the future of the universe.

The course emphasizes the physical processes at work in the universe and the methods we use to learn about the universe. There is little about sky lore. Homeworks might

include small observing projects but there are no true laboratory exercises in the course; this is a lecture course, not a lab course.

The course often requires mathematics at the level of first-year algebra. If you are uncomfortable with this level of mathematics, you should consider a different section of AST 301.

Course Organization: The primary source of information for the course is the textbook and you will be responsible for all material in the textbook unless specifically told otherwise. You must, therefore, buy or have access to the textbook.

The course lectures will generally be devoted to the most important, most difficult, and most interesting subjects from the text. Attendance at the lectures is not required but you should attend them regularly anyway because material not in the textbook will sometimes be discussed and you will be required to know that material.

In addition, we offer non-compulsory help sessions. These help sessions are smaller and have a much less formal environment than the lectures. They are unstructured but are usually devoted to:

- Help on the material covered in the lectures and textbook. It is impossible to give everyone as much personal attention during the regular lectures as they may need – the class is too large. The help sessions are the best place to get personal attention.
- Help on homework assignments. The best way to get good grades on homework assignments is to attend help sessions.
- Review sessions. The help sessions before exams will be used for reviews.

There is a web site for the course containing the following information:

- Organizational material for the course.
- The course syllabus and a course calendar.
- Outlines of the lectures and pdf versions of the powerpoint presentations.
- Study guides for the exams.
- Answers to homework and exam problems.
- An on-line course grade book.

Both Dr. Robinson and a TA hold regularly scheduled office hours. You may visit us during office hours for any reason without an appointment. They are available by appointment at other times.

Dr. Robinson may miss some classes during the term because of travel to McDonald Observatory or to scientific meetings. Other instructors will teach the class during his absence and will cover the material he would have covered, but if having the same instructor throughout the term is important to you, you should consider switching to a different section of AST 301.

Finally, students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259.

Course Grade: Your course grade will be based on examinations and homework.

Exams: There will be five examinations. The first four will be given during the term in regularly scheduled lecture hours and the fifth is a comprehensive final exam given during the final exam period. The likely dates of the four exams given during the term can be found in the course calendar on the course web site. The time and location of the final exam are set by the registrar. The preliminary time of the final can be found on the registrar's web site; the and will be announced near the end of the semester. The lowest of the five exam scores will be dropped without prejudice and will not count towards your final grade. There will be absolutely no make-up exams, no matter how good your reason for missing the exam; dropping the lowest score will cover the situation where an exam is missed for a legitimate reason. *Dropping your worst exam score is a crucial protection for you; do not waste this protection frivolously!* The remaining four exams, including the final exam, all have equal weight. Each will contribute 20% of your final grade.

Homework and observing projects: There will be about 10 homework assignments. Together they will contribute 20% of your final grade. The homework score may not be dropped and replaced by a fifth exam.

The letter grade will be assigned on the following absolute scale:

Numerical Grade (Percent)	Letter Grade	Numerical Grade (Percent)	Letter Grade
83.00 to 100.0	A	57.00 to 59.99	D+
80.00 to 82.99	A−	53.00 to 56.99	D
77.00 to 79.99	B+	50.00 to 52.99	D−
73.00 to 76.99	B	00.00 to 49.99	F
70.00 to 72.99	B−		
67.00 to 69.99	C+		
63.00 to 66.99	C		
60.00 to 62.99	C−		

In past years the average course grade has been mid- to low B.

Cheating, Plagiarizing, and Other Miss-Behavior: The penalty for cheating on an exam is a score of zero for the exam and the zero will be included as one of the four exam scores used to calculate your final grade.

Students are strongly encouraged to discuss homework and projects with each other, but all work you turn in for grades must be your own work in your own words. You may not copy from each other and must even avoid agreeing on specific wording for answers. The penalty for a first offense is a warning. The penalty for a second offense is a score of zero for all involved homeworks. Note that the copies and the homework from which they were copied will all receive zeros. This means you are responsible for preventing your homework from being copied.

Behavior that disrupts the learning experience of other students may, in principle, be penalized by lowering your final grade, but, in truth, this penalty has never had to be assessed.

Help Sessions

Time	Location	Instructor
Thursdays, 2:00 – 3:30 PM	RLM 7.114	Hwang
Thursdays, 5:00 – 6:30 PM	ECJ 1.204	Hwang
Thursdays, 7:30 – 9:00 PM	RLM 15.216B	Robinson

Course Calendar

Date	Lecture Number	Subject	Textbook Chapters
Aug 26	1	Course organization	1
Aug 28	2	Contents of the universe	1
Aug 31	3	Overview of the solar system	2
Sept 2	4	Kepler's laws of planetary motion	3
Sept 4	5	Newtonian gravity	3
Sept 7		No lecture. Labor day.	
Sept 9	6	The Earth	7 & 8
Sept 11	7	Mars	7 & 8
Sept 14	8	Jupiter	9 & 11
Sept 16	9	Comets, Meteorites, & Asteroids	12
Sept 18	EXAM 1		
Sept 21	10	The distances to the stars	4 & 13
Sept 23	11	The wave nature of light	4
Sept 25	12	Kirchhoff's first law; the temperatures of stars	4 & 5
Sept 28	13	The Hertzsprung-Russell diagram	13
Sept 30	14	Atoms and photons	4 & 13
Oct 2	15	Kirchhoff's Second and Third Laws; Stellar spectra	4 & 13
Oct 5	16	Stellar spectroscopy; the chemical composition of stars	4 & 13
Oct 7	17	The Doppler shift; the masses of stars	4 & 13
Oct 9	EXAM 2		
Oct 12	19	Nuclear energy	14
Oct 14	20	Stellar structure: Constructing models of stars	14
Oct 16	21	The structure of main-sequence stars: the sun	14
Oct 19	22	Interstellar matter and star formation	15
Oct 21	23	The origin of the solar system	6
Oct 23	24	Stellar Evolution: main sequence to horizontal branch	16
Oct 26	25	Stellar Evolution: horizontal branch to white dwarfs	16
Oct 28	26	Supernovae; origin of the elements	17
Oct 30	27	The theory of relativity; black holes	17
Nov 2	28	Black holes in binary stars	17
Nov 4	29	Our galaxy – the Milky Way	19
Nov 6	EXAM 3		

Course Calendar (continued)

Date	Lecture Number	Subject	Textbook Chapters
Nov 9	30	Elliptical galaxies	18
Nov 11	31	Spiral galaxies	18
Nov 13	32	Irregular and interacting galaxies; galaxy clusters	18 & 19
Nov 16	33	Expansion of the universe; large scale structure	20
Nov 18	34	Quasars	18
Nov 20	35	Supermassive black holes in galaxies	18
Nov 23	36	Introduction to cosmology; the age of the universe	20
Nov 25	37	The Big Bang	21
Nov 27		No lecture. Thanksgiving.	
Nov 30	38	Modern Cosmology: Inflation and structure formation	21
Dec 2	40	The future of the universe	21
Dec 4	EXAM 4		
Dec 9		FINAL EXAM for the 11 AM - Noon course	
Dec 15		FINAL EXAM for the 10 AM - 11 AM course	