SYLLABUS: ASTRONOMY 1010, SPRING 2005
ASTRONOMY OF THE SOLAR SYSTEM

Prof. Paul J. Wiita

Lecture Timings: Tuesdays & Thursdays: 9:30 AM — 10:45 AM

Room: 608 Classroom South

Office Hours: Mondays 10:00 – 11:00 AM, Tuesdays 1:30 – 2:30 PM, Wednesdays 10:00 – 11:00 AM; and by appointment if you cannot come at any of those times.

To contact Dr. Wiita: Rm. 715 One Park Place; Ph: 404 651-1367;
Preferred mode: e-mail: `wiita@chara.gsu.edu`;
URL: `www.chara.gsu.edu/~wiita` My home number in Atlanta is 609 273-7177 if you need to contact me urgently outside office hours. I will not normally be in the office on Fridays this semester, as I will be spending most weekends in New Jersey with my family. If you need to contact me over the weekend you can call me in my office at Princeton University on those Fridays at 609 258-1164 or at home at 609 683-3834; I will be reading my e-mail frequently on Fridays but only sporadically on Saturdays and Sundays. I will communicate with you via your student e-mail account at GSU, so you should either check it frequently or arrange to forward mail sent there to your preferred e-mail address.

Required Textbook: E. Chaisson & S. McMillan, **Astronomy Today**, Fifth Edition (2005), Pearson Prentice Hall. You should buy a new copy that contains the Lecture/Tutorial book, which will be needed for the lab. (This book can be purchased separately, but its cost plus that of a used text will exceed the cost of a new textbook.)

GENERAL INFORMATION:

Astronomy Today is an excellent text, but will not include all the material in my lectures (and I will not cover everything in the text). The CD-ROM and web-site (URL:`wps.prenhall.com/esm_chaisson_astronomytoday_5`) should be quite helpful to many students. Many of you might also benefit from looking at texts with different viewpoints; another excellent book is **The Cosmic**

Perspective by Bennett et al.

All students are expected to be familiar with the Policy on Academic Honesty, section 1380, p. 62, of the 2004–2005 **Undergraduate Catalog**; furthermore, you are expected to abide by it. Cheating will certainly earn you a zero on that quiz or exam, and the penalties can be substantially more severe.

You are expected to be considerate and respectful of other students; talking (other than to ask questions of me) or eating in class are some obvious forms of discourtesy. Obviously, cell phones and pagers must be turned off while in class. If you find yourself distracted by the behavior of other students, please bring that discourtesy to my attention, since there is an excellent chance I will not notice that disruption in such a large classroom.

COURSE GOALS:

This is the first of two introductory astronomy courses which include a weekly laboratory. You will begin your study of the nature of the entire universe, starting with the basic knowledge of the night sky that most civilizations here on earth managed to acquire. We will then discuss the revolutionary view that the Sun, not the Earth, is the center of the solar system. Fundamental physics, including the basics of gravity, will next be introduced, since this is the force that rules the structure and orbits of planets, stars and galaxies. We will then discuss the properties of light, since it is mainly through radiation that astronomers can gather information about planets, asteroids, stars, galaxies and the universe as a whole. The remaining topics are: properties of the solar system; nature of the terrestrial planets; nature of the giant planets and their moons and rings; smaller bodies within the solar system; how this system probably formed. Aside from learning a significant amount of exciting and important factual material, comprising a summary of our best current knowledge of solar system astronomy, students should come away from this course with an appreciation of the techniques and thinking styles employed by scientists when they attempt to understand what is going on in very distant places which they cannot visit to perform experiments. Quantitative reasoning will be used frequently; however, the only mathematics you are expected to know is basic algebra and very simple geometry.

COURSE REQUIREMENTS:

You are responsible for all the material in the assigned readings and in the lectures unless you are specifically told otherwise. While attendance at every lecture is not required, it is expected, and it will be extremely difficult for any student to get a grade of C or better if (s)he does not attend nearly every class. If you must miss a lecture, you should be certain to hand copy the notes of another student as soon as possible; this active copying is far more useful than making an electronic copy and just reading it. A summary of most class notes, as well as assignments and answers to assignments will be posted directly to my web-site, at `http://www.chara.gsu.edu/~wiita/a1010s05.html` These abbreviated notes will not substitute for the need to attend (and pay attention in) class, but they will allow you to check that you have not made significant errors in your personal notes. Although I hope to produce PowerPoint presentations for many of the classes, these will not be posted to my website.

You are **strongly encouraged to ask questions before, during or after class** if something is not clear. If it is not possible for yor to attend any of my office hours, please make an appointment to meet with me at another time. I hope that most of you will visit me during office hours at least once during the semester. I *strongly urge* you to read the assigned chapter *before* the corresponding lecture(s). As you do so, note the points with which you have difficulty, so that if they are not clarified during the class you can immediately raise questions. Soon after the lecture, you should carefully (re-)read the corresponding text sections to reinforce the material.

There will be four one-hour exams. All of the questions will be of a short answer (true/false, multiple choice, matching, fill-in-the-blank, etc.) variety. No more than 25% of any exam will comprise questions involving simple mathematics. The examination questions will stress the material covered in class, so punctual attendance and careful notetaking will be keys to doing well; however, there will typically be a few questions asked that are covered in the text but not the lectures, so don't neglect your reading.

The average student will do well in this course if (s)he devotes four to six hours a week (outside of lecture and lab) to reading the textbook and reviewing her or his notes. If you are not prepared to devote this much time to studying, you should not be taking a science course this semester. Although I will only assign a small number of questions to be graded, you

should be sure to answer many of the questions at the end of each chapter and on the textbook web-site to test your knowledge of the material well in advance of exams.

GRADING:

Each of the four hour exams will count as 16% of your grade. Two or three pop quizzes and four assignments will comprise a total of 11%, and your lab work will count for the remaining 25%. (Because Dr. Wiita will be out of the country during the final exam period there will be no cumulative final exam this semester.)

There will be no make-up exams; however, the lowest of the four hour exam grades will be dropped in computing your final grade, so if you miss one of the hour tests that will count as your lowest score and each of the other tests will count for 21.3333% of your grade. If you miss two of them, you'll receive a zero for one, and the remaining exams will still contribute a maximum of 42.6666 out of 100 points, so it will be impossible to get a grade above C (and it would be highly unlikely to get one above D). *Therefore, don't get sick on more than one exam date.* There can be no make-up for an unannounced quiz, so missing one yields a zero; this provides an incentive for attending every class. Note that all assignments will be posted to the web-site, so that if you miss class on a given day, be certain to check if an assignment was given so that you can do it and hand it in on time.

An average grade of 90% or better earns an A, an average grade of at least 80% yields a B, 70% or better produces a C, and an average of 60% or better is enough for a D. It is very difficult to fail this class, but typically one or two students do figure out how to do so.

If the mean class grade on an exam falls below 70% I will 'curve' the scores so as to bring the mean up to above 70%.

Most people do quite well on the lab portion of the course, and this tends to raise one's final average.

THE LABORATORY COMPONENT OF THIS COURSE:

When you registered for this course you automatically signed up for one of the associated lab sections, to be held in Room 528 Kell. Before attending the first lab (on Jan. 18–24) you must have purchased the lab manual by J. Wilson and have the Lecture/Tutorial Book, which should come with new copies of the textbook. You will also need to obtain some required supplies which are listed on the lab syllabus you will receive during your first lab. That first lab, on the Celestial Sphere, will require you to bring nothing but the lab manual.

Ms. Erika Grunstrum (Rm. 711 One Park Place, Ph: 404 651-1271, erika@chara.gsu.edu), is in overall-charge of the labs. Either Ms. Grundstrom or one of the Graduate Laboratory Assistants will be your lab instructor. If you have any questions about the labs, be sure to ask your instructor first, then Ms. Grunstrom, or one of the other lab coordinators, Mr. Kevin Marshall or Ms. Angela Osterman. Contact me about labs only after you have spoken or e-mailed one of them, and are not satisifed with the response you received.

CRN 10414 corresponds to a lab on Fridays from 11:00 AM to 12:50 PM;
CRN 10415 to a lab on Mondays from 9:00 AM to 10:50 AM;
CRN 10416 to Wednesdays from 9:00 AM to 10:50 AM;
CRN 10417 to Tuesdays from 11:00 AM to 12:50 PM;
CRN 10418 to Thursdays from 1:00 PM to 2:50 PM.

If you miss a lab during the course you will have an opportunity to make it up at the very last lab meeting. Any missed lab that is not made up (which includes any in excess of one per semester) counts as a zero, and will have a substantial negative impact on your lab grade, which in turn, you will recall, is worth 25% of your course grade. You are also required to attend an observing session, the schedule of which will be announced in the labs. Finally, note that while you are **expected** to complete every lab you **absolutely must** attend at least 7 labs and an observing session in order to get credit for this *laboratory science* course (i.e., if you miss half or more of the labs, you can't pass the course, even if you have a 100% average on the exams, assignments and quizzes).

Feel free to give me suggestions at any time (in person after class, or via phone or e-mail) on how we might work together to make this class better.

COURSE SCHEDULE

Date(s)	**Topic**	**Chapter**
Jan. 11	Introduction; What is Astronomy?	Preface
Jan. 13, 18	The Night Sky	1
Jan. 20	Ancient Astronomy: The Geocentric View	2
Jan. 25	Copernicus & Galileo: The Heliocentric View	2
Jan. 27, Feb. 1, 3	Kepler & Newton: Laws of the Solar System	2
Feb. 8	FIRST HOUR EXAMINATION	1 – 2
Feb. 10	Orbits and Light	2, 3
Feb. 15	Light and EM Radiation, concluded	3
Feb. 17	Fundamentals of Spectroscopy	4
Feb. 22, 24*	Telescopes & other Astronomical Instruments	5
Feb. Mar 1	SECOND HOUR EXAMINATION	2 – 5
Mar. 3†	Overview of the Solar System	6
Mar. 8, 10	SPRING BREAK	
Mar. 15	The Earth: Surface and Interior	7
Mar 17, 22	Earth's Atmosphere; Moon and Mercury	7, 8
Mar. 24, 29*	Venus & Mars	9, 10
Mar. 31	THIRD HOUR EXAMINATION	6 – 9
Apr. 5, 7	Jupiter and its Moons	11
Apr. 12, 14	Saturn and its System	12
Apr. 19	The Outermost Planets	13
Apr. 21	Asteroids, Comets & Meteoroids	14
Apr. 26*	Formation of the Solar System	15
Apr. 28	FOURTH HOUR EXAMINATION	10 – 15

*An assignment will be due this day; they will be handed out and posted at least five days earlier.

†Mar. 4th is the last day to withdraw with a grade of W possible; see Section 1332.10 of the Undergraduate General Catalog.

Of course, **modifications to the above schedule may be necessary**.