PHYSICS 1061 ``Stars and Galaxies'' Spring 2023

Class Home page: https://jpastro.net/AST1061/syll-ast1061.html (this page!)

Department: Physics and Astronomy Class time and place: MWF,9:00-9:50 am, Me 113 Section: 1 (CRN=30769) Instructor: **Dr. Jason Pinkney** Office hours: in 111 Science Annex on Tue at 10 am and 2-4 pm, on Thu at 9-11 am. E-mail j-pinkney@onu.edu or call 419-772-2740. Instructor's Home page: https://jpastro.net Credit hours: 3 Observatory Phone: 772-4028	

NEW STUFF (*Watch this spot for new links, outlines, solutions, etc.*)

Pumba, Timon, and Simba wondering about the universe
This is a link about solving word problems.
Astronomy Picture of the Day (APOD)
SkyMaps.pdf Color version of all 4 constellation sheets.
Interactive scale of the universe.
Week 1-2 outline (PDF) Powers of 10 and some Ch 1 material.
Powers of 10 (9 minute video shown in class)
Review questions for 1st quiz.

Text: Astronomy Today, 9/E (9th Edition) by Chaisson and McMillan. This 2017 edition has a "rent-only" ISBN-13 of 978-0134450278. This is what we have in the bookstore. Do NOT buy the Volume 1 or 2 versions ("The Solar System" and "Stars and Galaxies"). Cost of rental should be about $76. I don't require you to bring the text to class.

Course Description:
Stars and Galaxies is an introductory astronomy course. You will learn about the nature of stars, galaxies and the universe. The details of our solar system are left to PHYS 1051. We will begin with a survey of the naked-eye universe (mostly nearby objects) and end with cosmology (the distant universe). In-between we will discuss such topics as the electromagnetic spectrum, the sunspot cycle, how stars are born and die, and galaxies. A recurrent theme will be distances and the *distance ladder* , a battery of techniques that take us from the Earth all the way out to the most distant galaxies. A tentative calendar of topics is outlined below.

Physics 1061 fulfills a general education learning outcome called 'knowledge of the physical/natural world'.

Course Objectives:
By the end of this course, students will:

- Obtain knowledge of astronomy
- Recognize some of the laws of physics inherent in astronomy
- Develop scientific skills related to astronomy
- Expand their personal cosmology ("theory of everything")
- Understand the nature of science in general

Lab:
The lab for this class, PHYS 1091 (1 hr), is designed for astronomy minors and physics majors with an astronomy core It is not required of PHYS 1061 students. You'll need my approval to enroll in the lab. If you are enrolled, expect an e-mail from me this week about choosing the meeting time.

Astronomy Minor:
You might consider being an astronomy minor if a good familiarity with astronomy would complement your current major. Consider entering an exciting field like astrobiology, astrochemistry, archeoastronomy,

cosmochemistry, science education, science illustration, or science journalism.

Observatory:
Your visits to the ONU Observatory will weigh into the "Observing" portion of your grade (see below). You should try to visit at least 3 times for 100%. There is a legal pad in the control room that you must sign for credit. I plan to be at the observatory for 1 hour on Friday nights (if < 50% cloudcover) so that I can help you fulfill your observing duties. Another time to visit is during meetings of the ONU Astronomy Club every other Wednesday night at 9 pm. Still another time is during "Public Events" which are held on Friday nights for **two** hours.
When you visit, bring along your **Constellation Sheets** and **observing forms** (see below), and try to get some views through our telescopes and binoculars. It is best if you label your constellation sheets **before** going out to the observatory. I can able to help you with your sheets and forms, although my attention may be divided. You can bring a friend or two (not necessarily signed up in the class) for the long, dark walk to and from the Observatory.

Grading:

You will be graded on the following:

Observing	Observing Forms, 3+ visits to Observatory	5%
In-class	Homework, in-class activities, participation	20%
Quizzes	Quizzes (drop lowest grade)	25%
Exams	There will be two exams and a final.	50%
Total		**100%**

Score to letter grade conversion:

<55	**55-70**	**70-80**	**80-90**	**90-100**
F	D	C	B	A

I will not grade any "harder" than the above. However, if the class mean drops below 75, I will grade more leniently.

Schedule (approximate):

Week of	Topic	Chapter(s)	Tests
1/23,25,27	Syllabus. Powers of 10 Cosmology.	1	Pre-course Survey
1/30,2/1,3	Naked Eye Universe, Celestial Sphere	1	
2/6,8,10*	Celestial Sphere: coordinates, seasons	1	quiz 1
2/13,15,17	Time, precession, parallax. History	1,2	quiz 2
2/20,22,24	History: Geocentric vs Heliocentric solar system	2	quiz 3
2/27,3/1,3	History: Kepler, Newton, the A.U.	2	Exam I
3/6,8,10	Light & Spectroscopy	3, 4	
3/13-17	**Spring Break**		
3/20,22,24	The Sun - Observatory visit	16	quiz 4
3/27,29,31	Stellar Properties	17	
4/3,5	ISM,Star formation	18,19	quiz 5
4/7	**Good Friday**	**-**	**-**
4/10,12,14*	Stellar Evol. - low-mass stars like Sun	20	
4/17,19,21	Stellar Evol. - High mass, supernovae	20,21	Exam II
4/24,26,28	The Milky Way Galaxy	23	quiz 6
5/1,3,5	Galaxies / The Distance Ladder	24	quiz 7

5/8,10,12	Cosmology.	26	Turn in constel. shts.
5/19 Friday	Comprehensive Final Exam on Friday 5/19, 9:15-11:15 am.	_	Final exam.
*** Feb 10 is last drop, Apr 14 is last W, 4/18 (Tues) is Honor's Day**			

Other Course Policies

Moodle will be used minimally for this course. This web page is my LMS! I may use Moodle to post your grades by importing them from my spreadsheet. I may also give a quiz on Moodle if we need to do remote learning or classes get cancelled.

Attendance is important for doing well in this course. Being absent directly lowers your attendance score - I will record attendance on some days and factor this into your "In-class" grade (see above). Absenteeism indirectly lowers your grade when you miss lecture material or in-class activity. Note that in-class activities cannot be "made up". Tests can be made up but only if you let me know in advance (e-mail is good), providing a ***valid reason*** for your absence. This may be that your team or musical group is on the road. If you miss because of an emergency, let me know as soon as possible, and provide proof of the emergency. "Proof" can consist of a signed note, or a name and phone number of a parent or authority figure who knows your situation. Make up any missed tests **before** I go over them during the next class.

Graded Homework consists primarily of answering questions and problems from the textbook. Homework will be accepted late, but will only receive 50% credit if it has already been graded. Try to turn it in *before* an impending absence. Homework will be scored on completeness and correctness, but not every question will be checked. Look for keys posted after your homework is due. I encourage you to discuss homework with your classmates, but don't copy their work verbatim. You may be docked points for this.

Quizzes will be given on most non-exam weeks. They will consist of 5-15 multiple choice/short answer questions. They cover the assigned reading and especially the material discussed in class. The exact time and day of the quiz will be announced in class. (They will not always be given on the same day shown on the calendar.) You can only make up a quiz that was missed because of a valid conflict or emergency. Also, you can only make up the quiz before the answers are revealed, which is usually the next meeting of the class. For this reason, I will drop your lowest quiz score.

Exams will be given roughly every 4-5 weeks. These will weigh most heavily towards your class grade. The **final exam** will be comprehensive, but will emphasize the last 3-4 weeks of material. The final will occur on Friday of finals week. *Do not schedule anything to conflict with your final exam! Do not ask to get out of this time!* Drop NOW if this will be a problem. ***Review Questions*** will be provided to help you prepare for quizzes and exams. They will appear under "NEW STUFF". Many of these questions will appear on the quizzes and exams and so it is strongly recommended that you use them to prepare. More than half of the questions on a given test will be found in the review.

Observing consists of filling out **constellation sheets** , **Observing Forms** , and visiting the ONU Observatory. I'll provide you with one hardcopy of the constellation sheets (aka sky maps). If you loose them, you can print out more from SkyMaps.pdf, which is a PDF file containing 2 sky maps (North and South) for 2 dates during the spring (4 sheets total).
Your job is to 1) write the names of the constellations within all of the constellation boundaries, 2) label the 6 brightest stars on each sheet, and 3) fill out this Observing Form on two different occasions in which you actually viewed the sky. #1 and #2 can be done on your laptop using a planetarium program (e.g, Stellarium). #3 must be done under open skies, but not necessarily at the ONU Observatory. For full observing credit, you must visit the observatory at least 3 times. Additional visits give you extra credit in the "Observing" portion of your grade. You must sign the log near the entrance to the observatory in order to get credit for a visit. The Observing Forms and Constellation Sheets are due on the last day of class.

Tutoring is available. You are welcome to drop by during my office hours, or you can make an appointment. Physics tutoring sessions should occur on Thursday evenings, starting at 7:00 PM.

Disruptions: You should ask questions during class, and talk during group activities, but in general you shouldn't talk while the professor is talking. Anything that distracts your teacher or your neighbors is hindering the teaching/learning process. This includes playing with your phones, laptops or tablets, talking with neighbors, coming to class late, and leaving class early. **Do NOT use your phones and laptops during class.** If you want to make a case that you should take notes with your laptop/tablet rather then traditional paper, come and see me.

Academic Misconduct: In *PHYS 1061* (this class), the biggest temptation will be to look at another person's work during tests. Do not wear caps during quizzes or exams or store information on electronic devices. The penalty for cheating is a zero score for the quiz or exam. See the link to the university's "Academic Honesty" in the table below.

Common syllabus information.. Here is common course information which applies to all courses. This includes the covid Safety Plan, Grading Modes, Readmission, Repeat Policies, and more.

Other Mandatory Syllabus Information:

Disability services	Academic Honesty (Append. F, p. 97)	Title IX

Cool Astro Links	Pinkney's Homepage	The ONU Physics Homepage	Hyperphysics