Physics 107: Astronomy Fall 2019

Instructor: Paul Voytas, Science 309, 327-7823, pvoytas@wittenberg.edu
Instructor Home Web Page: http://userpages.wittenberg.edu/pvoytas
Office hours: To be announced
Class Web Site: http://userpages.wittenberg.edu/pvoytas/courses/p107_f19/p107_f19index.htm
Class meets: 1:00-2:05 pm MWF, Science 319; Observing Sessions to be announced

Course Materials:
Textbook:

Astronomy
Textbook URL: https://openstax.org/details/books/astronomy
Online HW URL: https://edfinity.com/

Supplemental material will be photocopied and distributed, or be available on the Web, or at the library.
Other materials: you will need a scientific calculator (i.e. one with trigonometric and exponential functions and scientific notation—there are many free apps that will do fine-ask me if you need suggestions).

Course Description: This course surveys fundamental concepts and recent developments in astronomy and astrophysics. We will not only look at what kind of things astronomy is concerned with, we will look hard at **how** we know what we know about those things, whether they are solar systems, comets, black holes, or the universe itself. This course is accompanied by periodic observing sessions. This course assumes a basic facility with algebra and trigonometry.

Course Goals: By the end of this course you should have:

- A working familiarity with the night sky and an understanding of the locations and motions of objects in it**.**
- An understanding of the basic tools of observational astronomy and how to use them.
- An understanding of how the science of astronomy is done. That is, understanding how we take astronomical observations and what we know of physics to build a model of things we observe.
- A basic understanding of the kinds of objects that makeup universe and how they fit together.
- Some understanding of how the solar system, stars, galaxies and universe are thought to have developed.

Activities: In order to achieve these goals, we wanted a variety of activities during the semester. These will include, but are not limited to:

- Textbook reading and reading questions.
- Homework assignments consisting of questions and problems from the textbook or ones that I provide.
- In class exercises.
- Exams.
- Observations. Observing sessions will be scheduled throughout the semester. These will include naked-eye observing of constellations, planets, etc., as well as binocular/telescope sessions.
- A Sky Knowledge test. A basic sky-knowledge assessment will be scheduled near the middle of the semester.

Details of these activities will be provided in separate handouts.

Accommodations: "Wittenberg University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, learning, chronic health, physical, hearing, vision and neurological, or temporary medical conditions, etc.) Please, let me know immediately so that we can privately discuss options. To establish reasonable accommodations, you must register with Accessibility Services by contacting Jamie Rippey, the Director of Accessibility Services at 937-327-7870 or by email at rippeyj@wittenberg.edu . Please note that services are confidential and may take time to put into place, and are not retroactive. The Accessibility Services Office is located in the Office of Academic Services COMPASS Sweet Success Center, Thomas Library on the first floor. Walk-in appointments are welcome 8 AM to 5 PM, Monday through Friday."

Exams: Exams will cover material from the readings, assignments, and in-class work. The exams will include quantitative questions that require calculations as well as qualitative (conceptual) questions. Let me know ahead of time if you have a legitimate conflict with a scheduled exam so a makeup exam can be arranged. ("Legitimate conflict" means a University-sanctioned event or other unavoidable and documented event.) If you miss an exam, you must contact me as soon as possible (leave a message or send email, if I'm not in), and then bring in documentation of the reason for missing the exam when you return to class. Tentative exam schedule is in the schedule below. Firm dates will be announced at least 1 week ahead of time.

Assignments: Assignments will consist of 1) In class activities 2) Questions and problems from the text or me 3) questions on readings. No late homework will be accepted. You are encouraged to work with each other (to discuss problems, talk about how you might approach a problem, etc.), but the work you turn in must be your own (except for any group assignments). There will be no make-up opportunities for in-class activities, but the two lowest scores on assignments of all types will be dropped.

Grading policy:

4 exams .....40 %
final exam ..... 20 %
sky knowledge..... 20 %
assignments .....…20%
TOTAL 100%

Letter grades will be assigned according to the percentage of possible points you have accumulated at the end of the semester. You are guaranteed that the divisions between grades will be no higher than the following: 90%≤A≤100%, 80%≤B<90%, 70%≤C<80%, 60%≤D<70%, F<60%. Plus/minus grade boundaries are 1/3 of the way to the next letter grade on each side (e.g. B/B+ border is 86.666). In borderline cases, attendance, class participation, and trend in exam scores will be used to decide whether to award the higher grade.

Academic Integrity: All work submitted for grading is subject to the Wittenberg Honor Statement: "I affirm that my work upholds the highest standards of honesty and academic integrity at Wittenberg, and that I have neither given nor received any unauthorized assistance." In particular, unless otherwise instructed, any work submitted must be your own. Please feel free to ask me if you have any questions concerning academic integrity.

Resources:

- Me (feel free to drop by or call during the day, or email any time you have a question).
- Textbook
- Oher online resources (see e.g. our class website)
- Each Other: **I strongly encourage you to form study groups** to get together to go over your notes from class and from reading the text to make sure things are clear, to discuss questions about material, and to talk about homework strategies and ideas.

Friendly advice:

- Astronomy and the physics underlying it aren't things you learn primarily by reading and memorizing; the way to learn them is to do them! Before coming to class, read the text with pencil in hand to jot down notes and questions, review the Learning Objectives at the beginning of the chapter, the Key Terms, Summary, and For Further Exploration sections at the end of each chapter. These should be helpful in organizing your approach and checking your understanding. Bring any remaining questions you have to class!
- Ask questions in class-any course related question, any time.
- Work practice problems and any example calculations in the text.
- You should expect to spend about 2-3 hours working outside of class for every hour you spend in class.

Exam dates:

Exam	Date	Time
Exam 1	9/13/2019	In Class
Exam 2	10/04/2019	In Class
Exam 3	10/25/2019	In Class
Exam 4	11/22/2019	In Class
Final Exam	**12/10/2019**	**3:30-6:30 pm**

Detailed Topics: TBD

Tentative topic schedule:

Week (date)	Topic	Chapters/Sections
1 (08/19)	The Sky	2,4.1
2 (08/26)	Earth, Moon, Sky	4
3 (09/02)	Orbits and Gravity	3
4 (09/09)	Electromagnetic Radiaion/Light/Spectra	5
5 (09/16)	Optical instruments/Telescopes	6
6 (09/23)	Solar System	7
7 (09/30)	Earth/Moon/Mercury	8,9
8 (10/07)	Venus/Mars	10
9 (10/14)	Giant Planets	11
10 (10/21)	Minor Members	12,13
11 (10/28)	Sun: Origin/Structure	14,15,16
12 (11/04)	Other Stars	17,18
13 (11/11)	Distances/structure around our Sun	19
14 (11/18)	Option1	
15 (11/25)	Option2	
16 (12/02)	Option3	