

# PHY 105: “Structure of the Universe”

## Spring 2013

**Course description:** - This is an introductory course in astronomy. We survey phenomena and objects in the Universe, from the very smallest distance scales to the largest objects in the cosmos. To gain a thorough understanding astronomical objects including as planets, stars, galaxies, we will need study the theories of motion, light, and matter (i.e., physics). The course also includes a historical consideration of the developments of modern theories of the physical world.

**Instructor: Dr. Robert Thornton**

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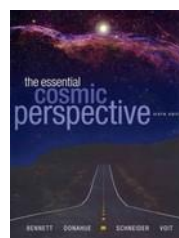
**E-mail:** [rthornton@wcupa.edu](mailto:rthornton@wcupa.edu)

**Office hours:** MW 1:00-2:30 p.m.; TuTh 1:00 – 2:00 p.m.; also by appointment

**Course Requirements:** This course has no prerequisites. However, we will be using some basic algebra at the high school math level. I will assume that you have done this sort of math before, though it may be a few years since you've seen it, so you may need to brush up on it. I will be happy to help you if you put forth the effort.

### Required Course Materials

- *The Essential Cosmic Perspective*, 6<sup>th</sup> ed., Bennett et al.
- a scientific calculator that is not part of any device with wireless capability.
- A-B-C-D cards



**Course Web page: Syllabus and related material will be on D2L**

### Grading:

Exam 1: 15%; Exam 2: 15%; Exam 3: 15%; Exam 4: 15% (60% total)

Homework: 15%

Cumulative final exam: 25%

**Total: 100%.**

**Attendance:** Attendance is an important part of the class, and will be taken on random days. Three unexcused absences are allowed. After you miss more than 3 classes, your final grade in the course will drop from 1/3 of a letter grade (for example from A to A-) with each additional class missed. Excused absences are limited to those due to participation in University sanctioned events (see policy in the WCU undergraduate catalog) or those accompanied by written confirmation from a doctor, the Dean of Students, etc. If you are sick, you MUST obtain a doctor's note. Finally, whether your absence is excused or unexcused (or if you are late to class), you will be responsible for any material covered and any announcements that were made in class that day.

**Homework:** There will approximately 8-10 homework assignments throughout the semester. Points will be deducted from assignments handed in late. Homework assignments and due dates are listed tentatively below, but changes may be announced in class. Homework will be accepted only during the first 10 minutes of class on the due date. There will be a penalty for late homeworks. Once assignment solutions are posted, absolutely no assignments will be accepted. If you miss class, you are responsible for finding out what homework was assigned and when it is due.

**Reading:** Students are expected to keep up with the reading in the book as (and preferably *before*) the associated material is covered in class. If you take the time to do this, things will make more sense in class and it will improve your performance on homework and exams. Pop-quizzes may be given if it becomes obvious to the instructor that people are not keeping up with the reading.

### **West Chester University General Education Goals:**

This course strives to have students meet the following general education goals:

1. Ability to communicate effectively
2. Ability to employ quantitative concepts and mathematical methods
3. Ability to think critically and analytically

### **Mid-Semester exam dates and policy:**

There will be four tests over the course of the semester. An unexcused absence on the day of a test will result of a grade of zero for that test. Excused absences are limited to those due to participation in University sanction events (see policy in the WCU undergraduate catalog) or those accompanied by written confirmation from a doctor, the Dean of Students, etc. If you are sick, you **MUST** obtain a doctor's note **BEFORE** the day of the test. I do not give make up tests. If you have an excused absence on the day of one of the tests, additional problems on the test material will be put on your final exam. You may only miss one exam due to an excused absence. You are encouraged to bring a calculator to the exams, but the calculator cannot be a part of a cell phone, iPod, etc. (i.e., it must be **ONLY** a calculator). I also reserve the right to check student ID during the exams, so make sure to bring your WCU ID to all exams!

### **Final Exam (Cumulative):**

The final exam is mandatory. Missing the final exam will result in a zero for the exam unless **EXTREME** circumstances apply. Even in that case, extra questions will be added to the make-up final.

**Public Safety:** All students are encouraged to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information and to sign up, visit [www.wcupa.edu/wcualert](http://www.wcupa.edu/wcualert). To report an emergency, call the Department of Public Safety at 610-436-3311.

### **Intellectual Property Statement:**

The instructor for this course utilizes copyrighted materials under the "Freedom and Innovation Revitalizing United States Entrepreneurship Act of 2007" (Fair Use Act). Apart from such copyrighted materials, all other intellectual property associated with this course is owned and copyright protected by the instructor, including, but not limited to, lectures, course discussions, course notes and supplementary materials posted or provided to students authored by the instructor, assessment instruments such as quizzes and exams, and Power Point presentations. No recording, copying, storage in a retrieval system, or dissemination in any form, whether electronic or other format, by any means of the intellectual property of the instructor, either in whole or in part, is permitted without the prior written permission of the instructor. When such permission is granted, it must specify the utilization of the intellectual property and all such permissions and waivers shall terminate on the last day of finals in the semester in which this course is held.

Links and references to on-line resources provided by the instructor may lead to other sites. The instructor does not sponsor, endorse or otherwise approve of any information appearing in those sites, nor is responsible for the availability of, or the content located on or through, external sites. Apart from materials used in accordance with the Fair Use Act, the instructor takes no responsibility for material that is otherwise offered at web sites and makes no warranty that such material does not infringe any third party rights. However, should any of this type of material be present and this fact is brought to the attention of the instructor, they will remove references to it from course materials.

## Course Schedule (Tentative!!)

Week	Date	Chapter	Topic	HW
1	Jan 29	1	Intro., Scales, Units, Math	HW #1 OUT
	Jan 31	1	Intro., Scales, Units, Math	
2	Feb 5	2	Motions, Moon, Seasons	HW #1 DUE; HW #2 OUT
	Feb 7	2	Motions, Moon, Seasons	
3	Feb 12	3	History and Kepler's Laws	HW #2 DUE
	Feb 14	4	Newton's Laws of Motion	HW #3 OUT
4	<b>Feb 19</b>		<b>TEST #1 (Ch 1-3)</b>	
	Feb 21	4	Conservation Laws & Gravity	
5	Feb 26	5	Light & Matter	HW #3 DUE; HW #4 OUT
	Feb 28	5	Light gets excited + Telescopes	
6	Mar 5	6	Formation of the Solar System	HW #4 Due; HW #5 out
	Mar 7	7	Earth & the terrestrial planets	
7	<b>Mar 12</b>		<b>TEST #2 (Ch 4 &amp; 5)</b>	
	Mar 14	8	Gas Giant Planets	HW 5 DUE; HW #6 OUT
8	Mar 19		Spring Break	
	Mar 21		Spring Break	
9	Mar 26	9	Asteroids, Comets, and Dwarf Planets	
	Mar 28	10	Our Star; the Sun	HW #6 DUE; HW #7 OUT
10	Apr 2	10	Fusion	
	Apr 4	11	Star Properties (Luminosity, Distance, Temperature, etc.)	HW #7 DUE; HW#8 OUT
11	Apr 9	11	Star Properties (Luminosity, Distance, Temperature, etc.)	
	<b>Apr 11</b>		<b>TEST #3 (Ch 6-10)</b>	
12	Apr 16	11 & 12	HR Diagram & Stellar Evolution	
	Apr 18	12	Stellar Evolution	HW #8 DUE: HW #9 OUT
13	Apr 23	13	Stellar Corpses: WD, NS, BH ... WTH?	
	Apr 25	14	The Milky Way	HW #9 DUE; HW#10 OUT
14	Apr 30	15	The Milky Way & Other Galaxies	
	<b>May 2</b>		<b>TEST #4 (Ch 11-13)</b>	
15	May 7	16	Dark Matter and Dark Energy: What we don't know	HW #10 Due; HW #11 out
	May 9	17	A brief history of the universe + the Big Bang	HW #11 due Dec 7 <sup>th</sup> 5 PM
xx	<b>May 16</b>		<b>FINAL EXAM 10:30 am – 12:30 pm</b>	<b>All done!</b>

**Disability:** West Chester University is committed to making accommodations for persons with disabilities. Please make your needs known by contacting your instructor and the Office of Students with Disabilities. Sufficient notice is needed in order to make the accommodations possible. The University desires to comply with the ADA of 1990.

**Other Policy:** For questions regarding Academic Dishonesty, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to their major department's handbook, the Undergraduate Course Catalogue, the Rams Eye View, or the University Web Site. Please understand that improper conduct in any of these areas will not be tolerated and may result in immediate ejection from the class.

