**PSC 105-01: The Cosmos** **Course Syllabus, Summer 2016**


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Class Meeting Time and Place: (FSB 102) 10:00-12:30 MTWR

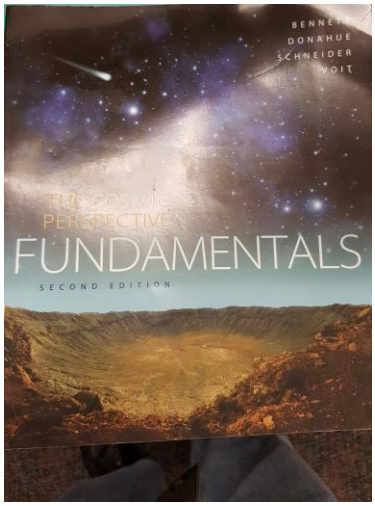
PLNU forward

**PLNU Mission**

**To Teach ~ To Shape ~ To Send**

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

**Materials -** The Cosmic Perspective Fundamentals, 2e. Bennett, Donahue, Schneider, Voit (2015) San Francisco: Pearson & Co. The text book is aimed to help you prepare for the class and answer reading questions posted on Canvas every week.

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**CANVAS and COURSEWORK:**

The online resource Canvas is integral for this course, and you are expected to login regularly. You need a reliable internet connection to be able to use this resource.

Online resources:

If you textbook is late use http: //www.astronomynotes.com/ to get ready for the class. Chapter 1 (Astronomy as a Science and a Sense of Scale) and Chapter 3 (Astronomy without a Telescope) will be covered in the first two weeks of class.

University of Nebraska-Lincoln also has free astronomy resources.
ClassAction, NAAP Labs, Interactives and Videos
http://www.astro.unl.edu/classaction/
Astronomy Picture of the Day: This online reference is worth looking at regularly.
http://www.apod.nasa.gov

**COURSE DESCRIPTION**

PSC 105 – The Cosmos is an introductory course appropriate for students with an adequate background in high school mathematics. The course is very detailed and teaches the entire Universe in 16 weeks.

It is a field that covers our own Moon and Earth, the Sun and our Solar System, to the Milky Way and outer galaxies and to the structure and origin of the universe. It is an indirect science, since the laboratory of astronomical objects is outside of our reach. This course will expose you to some ingenious indirect methods to discover truths about our universe. We will start with the most familiar elements of astronomy: scientific measurement, methods of measuring distance, the sky, the solar system, stars, constellations, and planets. As the semester progresses we will delve into motion and orbits, the properties of light (an astronomical phenomena which can be measured from Earth) and nebulae, galaxies, and cosmology and the expansion of the universe. This course will reveal the beauty, design, structure and behavior of the created universe and show the imaginative mind of the Creator Himself.

**COURSE LEARNING OUTCOMES**

– An emphasis is placed on both conceptual understanding and the ability to solve problems dealing with the concepts studied. As part of the General Education at Point Loma this particular course places a particular emphasis on quantitative reasoning, particularly through the lens of the physical sciences.
The main objective of this course is to fulfill the physical science requirement of a general college education while using the discipline of astronomy as a tool. That is, this course aims to teach you how to think critically and scientifically, and to give you a cosmic perspective of our universe.

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Specifically you be able to:

1. Developing basic scientific literacy and insight into the integrated scientific description of our whole cosmos.

2. Understanding how modern science relates to human culture and the origins of modern cosmology.

3. Observe the science of the physical universe as a dynamic changing system, and which of these processes are evolutionary processes.

4. The integration of modern science and personal faith.

**General Education Learning Outcomes:** GELO 1e will be assessed directly using problems on the final exam that are quantitative in nature.

**Class Meetings** – Learning astronomy requires active learning and participation during class. In preparation for each class meeting there is a reading assignment. To maximize your learning and participation during our meetings it is very important that you have read this material before class.

## ASSESSMENT AND GRADING

**Homework/In Class problems –** Homework is worth 20% of your final grade.

*Submission:* Written homework solutions should be worked neatly in clear logical steps. (Solutions and explanations should be clear enough that one of your peers could easily follow what you did if they had not worked the problem before.)

*Collaboration*: We expect and encourage collaboration between you and your peers while working on your homework, but your work should be your own original solutions. Allow adequate time to work and think about problems by yourself first before you work together with your peers or ask questions of me. When you sit down to write up a problem, you should not use notes copied from someone else. The guideline is that you should have no trouble explaining or repeating work that you turn in.

*Late Submission:* Up to one late assignment per quad will be accepted late with a 10% reduction in grade for every day it is late. This begins with a 10% reduction for an assignment turned in later in the day after this homework has been collected at the beginning of class.

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**Exams –** Examinations will be given in class, which count toward 40% of your final grade, consisting of three midterms. The final exam is comprehensive and counts for 25% of your grade. Exams will be closed book. Partial credit will be given for correct reasoning at any step of the problem, but only if it is communicated clearly enough for me to understand. For problems that call for a solution or explanation, no credit will be given for an answer alone; the method or reasoning must also be shown.

**Final Grades –** The grade you earn in this course is roughly based on the following scale: 100%-90% A, 90%-88.0% A-, 88%-85% B+, 85%-81% B, 81%-78% B-, 78%-75% C+, 75%-70% C, 70%-68% C-, 68%-65% D+, 65%-61% D, 61%-57% D-. The points you receive during the course are weighted accordingly: in-class quizzes: 15%, homework: 20%, exams (4): 40%, final exam: 25%.

***The Final Exam will be on the Last Day of Class: June 9, 2016, Thursday, 10:00 a.m.***

## PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See Academic Policies for definitions of kinds of academic dishonesty and for further policy information.

## PLNU ACADEMIC ACCOMMODATIONS POLICY

If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See Disability Resource Center for additional information.

## PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See Academic Policies in the Undergraduate Academic Catalog.

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## FINAL EXAMINATION POLICY

Successful completion of this class requires taking the final examination **on its scheduled day**. The final examination schedule is posted on the Class Schedules site. No requests for early examinations or alternative days will be approved.

## PLNU COPYRIGHT POLICY

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

## FERPA POLICY

In compliance with federal law, neither PLNU student ID nor social security number should be used in publicly posted grades or returned sets of assignments without student written permission. This class will meet the federal requirements by (Note: each faculty member should choose one strategy to use: distributing all grades and papers individually; requesting and filing written student permission; or assigning each student a unique class ID number not identifiable on the alphabetic roster.). Also in compliance with FERPA, you will be the only person given information about your progress in this class unless you have designated others to receive it in the "Information Release" section of the student portal. See Policy Statements in the (undergrad/ graduate as appropriate) academic catalog.

**Questions are always welcome and encouraged**. The best way to learn is to ask questions and challenge what you are being taught. Feel free to talk to me after class or via email if you have any questions. I hope you enjoy my course!

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**PSC 105 Class Schedule (Tentative Summer Schedule) – Under Construction** 

| Week | Date | Topics covered | Chapters, sections |
|---|---|---|---|
| Week 1 | 05/09 | Introduction: Why Cosmos<br>Chapter 1: Modern View of the Universe | Introductions |
| | 05/10 | Local Neighborhood, Scale for the Universe, History | |
| | 05/10 | Chapter 2: Discovering the Universe | |
| | 05/11 | Constellations, Motions in the Sky<br>Seasons | |
| | 05/11 | Chapter 2: Moon phases | |
| | 05/12 | Chapter 2: Eclipses, Planetary Motion | |
| | 05/12 | Science and History of Astronomy | |
| Week 2 | 05/16 | Copernicus, Kepler<br>Galileo | |
| | 05/16 | Making Sense of the Universe, Newton's Laws | |
| | 05/17 | Energy & Conservation, Gravity | |
| | 05/17 | Review | |
| | 05/18 | EXAM #1 | |
| | 05/18 | Light and Information and Information, EM Spectrum | |
| | 05/19 | Doppler | |
| | 05/19 | Telescopes | |
| | 05/19 | Doppler Shift | |
| Week 3 | 05/23 | Solar System Planets<br>Formation and Nebular theory | |
| | 05/23 | Ordering the System, Timeline and ages | |
| | 05/24 | Earth and the Terrestrial Planets, Moon, Mercury | |
| | 05/24 | Mars, Venus, and Earth | |
| | 05/25 | Tritan, Enceladus, Our Sun | |
| 3 | 05/25 | Our Sun | |
| | 05/25 | Asteroids, Comets | |

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| | 05/26 | *EXAM Review* |
| | 05/26 | EXAM #2 |
| Week | | |
| | 05/30 | Dwarf planets, planets and moons |
| | | Exam Review |
| 4 | 05/30 | EXAM #2 |
| | 05/31 | Surveying the Stars |
| | 05/31 | Star Stuff (Evolution) |
| | 06/01 | Chapter 12: Surveying the Stars |
| | 06/01 | Chapter 13: Star Stuff (Evolution) |
| | 06/01 | H-R Diagram |
| | 06/02 | Hi Mass Stars, Binary Stars |
| | 06/02 | Stellar Remnants |

(To Be Continued . . . . . )