PSC 1004 – Cosmos 4 Units Summer 2020

PLNU Mission Statement
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 is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Professor: Dr. Heide Doss
Office: Rohr Science 282
Phone: cell: (619) 840-4559; office: (619) 849-2219
E-mail: email me through Canvas or hdoss@pointloma.edu
Course Dates: May 11, 2020 – June 12, 2020
Office Hours via zoom: MTWR 10:00 AM – 11:00 AM Pacific Time, except for exam days, or by appointment
Exam Days & Times: M 5/18, T 5/26, M 6/1, M6/8 between 10:00 and 11:15 AM Pacific Time
Final Exam: Friday, June 12, 10:00-12:30 AM Pacific Time
Lectures on google drive: https://drive.google.com/drive/folders/0APDtNzDA1P6rUk9PVA)
Main course information site and gradebook on Canvas
Preclasses and HW chapter problems on Mastering Astronomy (www.masteringastronomy.com)

Textbook: The Cosmic Perspective Fundamentals by Bennett, Donahue, Schneider, & Voit, 3rd edition, Pearson 2020

Access to Mastering Astronomy:
Course ID: MADOSS2255000, Course Name: PSC1004 Su 2020
Link to mastering astronomy: www.masteringastronomy.com

A scientific calculator (not a phone app) is also needed for the course. It doesn't need to be fancy. For example a TI-30XIIS is good and only runs about $15.

Course Description: (4)
An introduction to our place in the universe emphasizing religious, cultural and historic perspectives including modern developments in physics and astronomy. (Meets a general education requirement; does not count toward any Chemistry or Physics majors.)

Prerequisite(s): MTH 0099 or equivalent.

PLNU provides a foundational course of study in the liberal arts informed by the life, death, and resurrection of Jesus Christ. In keeping with the Wesleyan tradition, the curriculum equips students with a broad range of knowledge and skills within and across disciplines to enrich major study, lifelong learning, and vocational service as Christ-like participants in the world's diverse societies and cultures.

This course is one of the components of the General Education Program at Point Loma Nazarene University, in support of the general education learning outcome: *Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature*. The purpose of general education is to provide a common educational experience, to develop essential skills, and to provide a broad cultural background for personal and professional growth. PSC 1004 – The

Cosmos is an introductory course appropriate for students with an adequate background in high school mathematics.

Student Learning Outcomes: In each section there are a number of smaller learning outcomes, which fit into broader course outcomes. Upon completion of this course you should be able to:

1. apply basic scientific principles to address topics in cosmology and astronomy;
2. explain observations of the cosmos in terms of scientific processes;
3. apply a scientific approach to ask and address questions about our planet, solar system, galaxy, and universe;
4. solve quantitative and qualitative problems relevant to introductory astronomy and interpret solutions.
5. discuss how modern science relates to human culture and the origins of cosmology;
6. discuss common views on the integration of science and faith.

Pre-class Assignments: Reading and pre-class questions are due by 11:59 PM the night before class, except for the first class. The pre-class questions are on our class site in Mastering Astronomy at www.masteringastronomy.com. These usually consist of questions and simple problems related to each section of the reading assignment. Pre-class assignments are 5% of the overall grade. Preclasses are also assigned for exam days and serve as a tiny review of the material.

Homework: Weekly homework assignments, besides the readings and pre-class questions, can be found on our class site in Mastering Astronomy at www.masteringastronomy.com. Homework consists of chapter problem sets in Mastering Astronomy at www.masteringastronomy.com. These chapter problem sets are worth 15% of your overall grade and are due by 11:59 PM as on the date noted in the syllabus and in mastering astronomy. Points earned for short class essays assigned that come up during the semester will also be included in the homework grade, and shown in the course gradebook on our class canvas site.

Late Work: Late work will not be accepted unless there is a documented emergency. Assignments are due as noted on the syllabus and on Mastering Astronomy. Incompletes are only assigned in extremely unusual circumstances.

You must take ALL the exams and the final in order to pass the class.

Papers, Projects, & Discussions: There will be various papers and projects assigned throughout the semester. The description of these assignments will be posted on Canvas. There will also be two discussions each week which require your response to the prompt and to two other students' repsonses. These will total 20% of your overall grade.

Exams: There will be four online exams during class scheduled time during the semester comprising 40% of your grade. There is also a final exam (worth 20% of your overall grade). Partial credit for non-multiple choice problems will be given for correct reasoning at any step of a problem, but only if it is communicated clearly enough for me to understand. For problems that call for providing your work or explanation, no credit will be given for an answer alone; the method or reasoning must also be shown. This will require you to solve the problems on paper and upload an image of your work. Exams will be on canvas and require that you also upload your work for problems that involve mathematical calculations or diagrams.

Missed Exam Policy: No make-up exams are allowed except for warranted circumstances. Arrangements must be made with me as soon as possible.

Final Exam: Date and Time: The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student. Successful completion of this class requires taking the final examination on its scheduled day, **FINAL EXAM: Friday, June 12, 10:00 AM - 12:30 PM.** The final examination schedule is posted on the Class Schedules site. No requests for early examinations or alternative days will be approved. The final exam is worth 20% of your grade.

Final Course Grade: The points you receive during the course are weighted accordingly:

Component	**Weight**
Pre-Class	5%
Homework	15%
Papers & Projects	20%
Tests (4)	40% (equally weighted)
Final Exam	20%

The grade you earn in this course is based on the following scale:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-
S≥ 91.5	91.5 >S≥ 89.5	89.5 >S≥ 86.5	86.5 >S≥ 82.5	82.5 >S≥ 79.5	79.5 >S≥ 76.5	76.5 >S≥ 72.5	72.5 >S≥ 69.5	69.5 >S≥ 66.5	66.5 >S≥ 62.5	62.5 >S≥ 59.5

Department Mission:
The Physics and Engineering Department at PLNU provides strong programs of study in the fields of Physics and Engineering. Our students are well prepared for graduate studies and careers in scientific and engineering fields. We emphasize a collaborative learning environment, which allows students to thrive academically, build personal confidence, and develop interpersonal skills. We provide a Christian environment for students to learn values and judgment, and pursue integration of modern scientific knowledge and Christian faith.

PLNU Attendance and Participation Policy:
Attendance is expected at each class session. In the event of an absence you are responsible for the material covered in class and the assignments given that day.

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 http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class_Attendance in the Undergraduate Academic Catalog.

Class Enrollment:
It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

Academic Accommodations:
While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. (DRC@pointloma.edu or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

Credit Hour:
In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for any 4 unit class delivered over 5 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

Copyright Protected Materials:
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.

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 http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Honesty for definitions of kinds of academic dishonesty and for further policy information.

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 distributing grades and papers individually. 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 academic catalog.

Tentative Course Schedule – subject to updates. Unless otherwise noted: Pre-class assignments are due by 11:59 PM the night before class, HWs are due by 11:59 PM on listed date.

Date	Topics	Assignments due
5/11 M	**Welcome** Science and Faith, Mini Math review 1.1 The Scale of the Universe 1.2 The History of the Universe 1.3 Defining Planets	Preclass 1 (PC1) due 5/11 11:59pm HW0 MastAstroHowTo 5/11 11:59pm HW1 due 5/12 due 11:59pm P0 due 6/10 (observations due each night from May 12 to June 1) Paper 1 (P1) due 5/22
5/12 T	2.1 Understanding the seasons 2.2 Understanding the Moon 2.3 The Puzzle of Planetary Motion	PC2 due 5/11 11:59pm HW1 due 5/12 Canvas discussion due (yours and responses to two others) Don't forget to begin observations tonight and each night for the next 21 nights!
5/13 W	3.1 From Earth-Centered to Sun-Centered 3.2 Hallmarks of Science 3.3 The Fact and Theory of Gravity	PC3 due 5/12 11:59 pm HW2 due
5/14 Th	4.1 Characteristics of the Solar System 4.2 The Birth of the Solar System 4.3 The Age of the Solar System	PC4 (remember due the night before) HW3 (always due night of unless noted) HW4 due Friday 5/15 11:59 pm Canvas discussion due (yours and responses to two others)
5/18 M	**EXAM 1 chapters 1-4** **10:00 to 11:15 AM Pacific Time** (Two parts- one part requires diagrams, explanations, and working out problems on paper and uploading your work on canvas, the other part is multiple choice on canvas – Each part is 35 minutes in length)	PC5 (review) P2 – Project 2 details and group assignments on canvas
5/19 T	5.1 Terrestrial Surfaces and Atmospheres 5.2 Histories of Terrestrial Worlds 5.3 Global Warming	PC6 HW5 Canvas discussion due (yours and responses to two others)
5/20 W	6.1 Jovian Planets, Rings, and Moons 6.2 Asteroids, Comets, and the Impact Threat 6.3 Extinction of the Dinosaurs	PC7 HW6
5/21 Th	7.1 Detecting Planets Around Other Stars 7.2 Characteristics of Extrasolar Planets 7.3 Extrasolar Planets and the Nebular Theory	PC8 HW7 P1 due Friday 5/22 11:59 pm Canvas discussion due (yours and responses to two others)
5/22 F		P1 due Friday 5/22 11:59 pm
5/25	**Memorial Day**	
5/26 T	**EXAM 2 chapters 5,6,7** **10:00 to 11:15 AM Pacific Time**	PC9 (tiny review – can be done 5/26 by 9:30 AM) Canvas discussion due (yours and responses to two others)

5/27 W	8.1 Properties of the Sun 8.2 Properties of Other Stars 8.3 Visualizing Patterns Among Other Stars	PC10 P3 – Project 3 details and group assignments on canvas (reminder P0 and see P3) HW 8
5/28 Th	9.1 Lives in the Balance 9.2 Star Death 9.3 Testing Stellar Models with Star Clusters	PC11 HW9 Canvas discussion due (yours and responses to two others)
5/29 F	10.1 White Dwarfs and Neutron Stars 10.2 Black Holes 10.3 Searching for Black Holes	PC12 HW10 Fri 5/29 P2 due5/29 11:59 pm
6/1 M	**Exam 3 Chapters 8, 9, 10** **10:00 to 11:15 AM Pacific Time**	PC13 (tiny review) LAST NIGHT OF OBSERVATIONS
6/2 T	11.1 Our Galaxy: The Milky Way 11.2 Galaxies Beyond the Milky Way 11.3 Seeking Supermassive Black Holes	PC14 HW11 Canvas discussion due (yours and responses to two others)
6/3 W	12.1 Measuring Cosmic Distances 12.2 The Implications of Hubble's Law 12.3 Observing Galaxy Evolution	PC15 HW12
6/4 Th	13.1 The Big Bang Theory 13.2 Evidence for the Big Bang 13.3 Inflation	PC16 HW13 Canvas discussion due (yours and responses to two others)
6/5 F		P3 due Fri 6/5 by 11:59 pm
6/8 M	**Exam 4 Chapters 11, 12, 13** **10:00 to 11:15 AM Pacific Time**	PC17 (tiny review)
6/9 T	14.1 Evidence for Dark Matter 14.2 Gravity versus Expansion 14.3 Evidence for Dark Energy	PC18 HW 14 Canvas discussion due (yours and responses to two others)
6/10 W	15.1 The Search for Life in the Solar System 15.2 The Search for Life Among the Stars 15.3 Evolution on Earth and Beyond	PC19 HW 15 Project 0 due by 6/10 11:59 pm
6/11 Th	REVIEW	Canvas discussion due (yours and responses to two others)
6/12 F	**Final Exam Friday, June 12,** **10:00 AM – 12:30 PM**	