



Physics and Engineering

**PSC 1004 – The Cosmos**

Number of Units: 4

*Spring 2024*

**Meeting days/times**

**Lecture: (MWF 1:30 pm – 2:35 pm)**

**Meeting location**

**Lecture: Bond Academic Center 103 (BAC 103)**

**Final Exam: (Mon, 4/29, 1:30 – 4:00 pm)**

<b>Instructor title and name:</b>	Dr. Anthony Cortez
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<b>Office location and hours:</b>	Office Hours: MF: 9:30-10:30am R: 8:45-9:45am By Appointment  Location: Rohr Science 282

## **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 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.

## **Department Mission**

The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

## **Foundational Explorations Mission**

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 culture.

## **Course Description**

PSC 1004 The Cosmos (FE) (4 Units)

An introduction to our place in the universe emphasizing religious, cultural and historic perspectives including modern developments in physics and astronomy.

Meets a Foundational Explorations requirement; does not count toward any Chemistry or Physics majors.

Prerequisite(s): MTH 0099 or equivalent.

## **Program and Course Learning Outcomes**

Course Learning Outcomes:

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, galaxy, and universe

4. Solve qualitative and quantitative problems relevant to introductory astronomy
5. Discuss how modern science relates to human culture and the origins of cosmology

### **Foundational Explorations Learning Outcomes**

This course is one of the components of the Foundational Experience program at Point Loma Nazarene University, through which students will acquire knowledge of human cultures and the physical and natural world while developing skills and habits that foster life-long learning. Specifically, this course supports this broader context in developing FELO 1e. Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature.

### **Required Texts and Recommended Study Resources**

*Understanding Our Universe - With Access By Palen 4<sup>TH</sup> Edition*

### **Course Credit Hour Information**

In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 4 unit class delivered over 15 weeks. It is anticipated that students will spend a minimum of 37.5 participation hours per credit hour on their coursework. For this course, students will spend an estimated 150 total hours meeting the course learning outcomes. The time estimations are provided in the Canvas modules.

### **Assessment and Grading**

Grades will be based on the following:

- **Preclass Assignments:** Each class day there will a few questions to answer electronically. These will be due one hour before class. Your responses to the preclass questions are graded on the following scale: 2=demonstrates reading/thinking, 1=significant room for improvement, 0=unsatisfactory.
- **Homework:** Homework will be assigned weekly and is due at the start of class the following week.
- **Activities:** Through the semester there will be small projects aligned with the textbook for you to complete.
- **Examinations and the Final Examination.** There will be 4 in semester exams and one final exam. Examinations and the Final Examination will include problems and questions over material assigned in the text, readings, and handouts, as well as material presented in class. No examination shall be missed without prior consent or a well-documented emergency beyond your control. A score of zero will be assigned for an examination that

is missed without prior consent or a well-documented emergency beyond your control. 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.

<b>Grading Distribution</b>	<b>Percent</b>
Preclass	5
Activities	20
Homework	25
4 In-Semester Exams	30
Final Exam	20
Total	100

<b>Standard Grade Scale Based on Percentages</b>					
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>F</b>
+		87- 89	77-79	67-69	
	91 -100	83-86	73-76	63-66	0-59
_	90-92	80-82	70-72	60-62	

### **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. If you find yourself scheduled for three (3) or more final examinations on the same day, you are authorized to contact each professor to arrange a

different time for one of those exams. However, unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

### **Incompletes and Late Assignments**

All assignments are to be submitted by the due dates. Assignments will be considered late if posted after the due date and time using Pacific Standard Time. Late assignments will receive a grade of 0.

### **Spiritual Care**

Please be aware PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith.

If students have questions, a desire to meet with the chaplain or have prayer requests you can contact your professor or the Office of Spiritual Life and Formation.

### **State Authorization**

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on State Authorization to view which states allow online (distance education) outside of California.

### **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.

### **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**

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center ([EAC@pointloma.edu](mailto:EAC@pointloma.edu) or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC.

### **Sexual Misconduct and Discrimination**

In support of a safe learning environment, if you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that accommodations and resources are available through the Title IX Office at [pointloma.edu/Title-IX](http://pointloma.edu/Title-IX). Please be aware that under Title IX of the Education Amendments of 1972, faculty and staff are required to disclose information about such misconduct to the Title IX Office.

If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact Counseling Services at [counselingservices@pointloma.edu](mailto:counselingservices@pointloma.edu) or find a list of campus pastors at [pointloma.edu/title-ix](http://pointloma.edu/title-ix).

### **PLNU Attendance and Participation Policy**

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions, the faculty member will issue a written warning of 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 an "F" grade.

**Tentative Schedule (Subject to Updates)**

<b>Date</b>	<b>Topic</b>	<b>Reading</b>
8-Jan (WEEK 1)	Introductions	
10-Jan	Our Place in the Universe	1.1-1.3
12-Jan	Patterns in the Sky: Vocab and Seasons	2.1-2.2
15-Jan (WEEK 2)	MLK Day NO CLASS	
17-Jan	Patterns in the Sky: Moon	2.3-2.4
19-Jan	Moon Phase Simulator - Activity	
22-Jan (WEEK 3)	Laws of Motion I	3.1-3.2
24-Jan	Laws of Motion II	3.3-3.4
26-Jan	Laws of Motion III	3.4-3.5
29-Jan (WEEK 4)	Light and Telescopes I	4.1-4.3
31-Jan	Exam 1	
2-Feb	Light and Telescopes II	4.3
5-Feb (WEEK 5)	The Formation of Stars and Planets I	5.1-5.3
7-Feb	The Formation of Stars and Planets II	5.4-5.6
9-Feb	Inner Solar System I	6.1-6.3
12-Feb (WEEK 6)	Inner Solar System II	6.4-6.5
14-Feb	Atmospheres I	7.1-7.3

16-Feb	Atmospheres II	7.3-7.5
19-Feb (WEEK 7)	Giant Planets I	8.1-8.3
21-Feb	Giant Planets II	8.3-8.5
23-Feb	Smaller Bodies I	9.1-9.3
26-Feb (WEEK 8)	Exam 2	
28-Feb	Smaller Bodies II	9.4-9.6
1-Mar	Measuring the Stars I	10.1-10.2
4-8 Mar	Spring Break NO CLASSES	
11-Mar (WEEK 9)	Measuring the Stars II	10.3-10.4
13-Mar	The Sun I	11.1-11.2
15-Mar	The Sun II	11.3-11.4
18-Mar (WEEK 10)	Low Mass Stars I	12.1-12.3
20-Mar	Low Mass Stars II	12.4-12.6
22-Mar	High Mass Stars I	13.1-13.3
25-Mar (WEEK 11)	Exam 3	
27-Mar	High Mass Stars and Black Holes	13.4-13.6
28-Mar – 1-Apr	Easter – NO CLASSES	
3-Apr (WEEK 12)	Measuring Galaxies I	14.1-14.2
5-Apr	Measuring Galaxies II	14.3-14.4

8-Apr (WEEK 13)	Dark Matter I	15.1-15.2
10-Apr	Dark Matter II	15.3-15.4
12-Apr	The Universe I	16.1-16.3
15-Apr (WEEK 14)	The Universe II	16.4-16.6
17-Apr	Structure I	17.1-17.3
19-Apr	Exam 4	
22-Apr (WEEK 15)	Structure II	17.4-17.5
24-Apr	Life in the Universe I	18.1-18.4
26-Apr	Life in the Universe II	18.1-18.4
29-Apr	Final Exam	