PSC 105 – Cosmos 4 Units Fall 2018

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: Trailers in Athletic Lot #2, closest to wall & ocean.
Phone: cell: (619) 840-4559; office: (619) 849-2219
E-mail: plnuPhysicsDoss@gmail.com or hdoss@pointloma.edu (response time faster for first email)
Office Hours: MWF 11:00 AM – 12:00 PM (office), Th 12:30 PM-2:30 PM (LA2) or by appointment. NOTE if you really need to see me I will also be around MF from about 10:00AM to 11:00AM but this is also around Chapel time – so you'll have to make up Chapel one evening.

Regular meeting times Aug 28, 2018 – December 7, 2018 (NOTE: T 8/28 is a M schedule**)**
Lecture: MWF 8:30 AM – 9:35 AM (LBRT 203)
Final Exam: Friday Dec 14th, 7:30 AM LBRT 203

Textbook: The Cosmic Perspective Fundamentals by Bennett, Donahue, Schneider, & Voit, 2nd edition, Pearson 2016

Access to Mastering Astronomy-Course ID: MADOSS29487, **Course Name:** PSC 105 Fall 2018

A scientific calculator (not a phone app) is also needed for the course.

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 099 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 105 – 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.

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. Homeworks consist 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 during class and class projects that might come up during the semester will also be included in the homework grade.

There will also be some short in class essays that will fall under this category. These were originally designed as homework problems, but will now be given during class at various points during the semester.

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: There will be various papers and projects assigned throughout the semester. These will be equally weighted and total 20% of your overall grade. The assignments and due dates will be discussed in class, and posted on canvas.

Exams: There will be four in-class exams 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.

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 Dec 14th, 7:30 AM LBRT 201**. 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 15 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 except the first day. HWs are due by 11:59 PM on the date listed.

Date	Topics	Assignments
8/28/18 T = Monday schedule	Science and Faith Math review 1.1 The Scale of the Universe 1.2 The History of the Universe	Preclass 1 due 8/29 Paper 1 due 9/8 HW ch 1 due 9/1 HW Mastering Astro due 9/1
8/29/18 W	1.3 Defining Planets 2.1 Understanding the seasons	PC 1 due by 11:59 PM 8/28 PC 2 due
8/31/18 F	2.2 Understanding the Moon 2.3 The Puzzle of Planetary Motion	PC 3 due by 11:59 PM 8/30 HW ch1due HW Mastering Astro due P0 due 10/17 (observations)
9/3/18 M	Labor Day - NO CLASSES	
9/5/18 W	3.1 From Earth-Centered to Sun-Centered 3.2 Hallmarks of Science	PC 4 due by 11:59 PM 9/4 HW ch 2 due
9/7/18 F	3.3 The Fact and Theory of Gravity 4.1 Characteristics of the Solar System	PC 5 due by 11:59 PM 9/6 HW ch 3 due
9/10/18 M	4.2 The Birth of the Solar System 4.3 The Age of the Solar System	PC 6 due by 11:59 PM 9/9 Paper 2 due
9/12/18 W	catch up/review/math practice	PC 7 due by 11:59 PM 9/11 HW ch 4 due
9/14/18 F	**EXAM 1 chapters 1-4**	P1 (our solar system) due 9/14 PC 8 due by 11:59 PM 9/13
9/17/18 M	5.1 Terrestrial Surfaces and Atmospheres 5.2 Histories of Terrestrial Worlds	PC 9 due by 11:59 PM 9/16
9/19/18 W	5.2 Histories of Terrestrial Worlds 5.3 Global Warming	PC 10 due by 11:59 PM 9/18
9/21/18 F	6.1 Jovian Planets, Rings, and Moons 6.2 Asteroids, Comets, and the Impact Threat	PC 11 due by 11:59 PM 9/20 HW ch 5 due
9/24/18 M	6.3 Extinction of the Dinosaurs 7.1 Detecting Planets Around Other Stars	PC 12 due by 11:59 PM 9/23
9/26/18 W	7.2 Characteristics of Extrasolar Planets 7.3 Extrasolar Planets and the Nebular Theory	PC 13 due by 11:59 PM 9/25 HW ch 6 due
9/28/18 F	catch up / math / presentations	PC 14 due by 11:59 PM 9/27 P2 (space missions) due 9/28
10/1/18 M	Presentations / Review / math practice	PC 15 due by 11:59 PM 9/30 HW ch 7 due
10/3/18 W	**Exam 2 chapters 5,6,7**	PC 16 due by 11:59 PM 10/2

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

Date	Topics	Assignments
10/5/18 F	8.1 Properties of the Sun 8.2 Properties of Other Stars	PC 17 due by 11:59 PM 10/4
10/8/18 M	8.2 Properties of Other Stars 8.3 Visualizing Patterns Among Other Stars	PC 18 due by 11:59 PM 10/7
10/10/18 W	9.1 Lives in the Balance 9.2 Star Death	PC 19 due by 11:59 PM 10/9 HW ch 8 due
10/12/18 F	9.3 Testing Stellar Models with Star Clusters 10.1 White Dwarfs and Neutron Stars	PC 20 due by 11:59 PM 10/11
10/15/18 M	10.1 White Dwarfs and Neutron Stars 10.2 Black Holes	PC 21 due by 11:59 PM 10/14
10/17/18 W	10.2 Black Holes 10.3 Searching for Black Holes	PC 22 due by 11:59 PM 10/16 HW ch 9 due P0 (observations) due 10/17
10/19/18 F	Oct 19 Fall Break no classes	
10/22/18 M	catch up / math review / presentations	PC 23 due by 11:59 PM 10/21 P3 (stars) due 10/22
10/24/18 W	math review / presentations	PC 24 due by 11:59 PM 10/23 HW ch 10 due
10/26/18 F	**Exam 3 Chapters 8, 9, 10**	PC 25 due by 11:59 PM 10/25
10/29/18 M	11.1 Our Galaxy: The Milky Way 11.2 Galaxies Beyond the Milky Way	PC 26 due by 11:59 PM 10/28
10/31/18 W	11.2 Galaxies Beyond the Milky Way 11.3 Seeking Supermassive Black Holes	PC 27 due by 11:59 PM 10/30
11/2/18 F	11.3 Seeking Supermassive Black Holes 12.1 Measuring Cosmic Distances	PC 28 due by 11:59 PM 11/1 HW ch 11 due
11/5/18 M	12.2 The Implications of Hubble's Law 12.3 Observing Galaxy Evolution	PC 29 due by 11:59 PM 11/4
11/7/18 W	12.3 Observing Galaxy Evolution 13.1 The Big Bang Theory	PC 30 due by 11:59 PM 11/6
11/9/18 F	13.1 The Big Bang Theory 13.2 Evidence for the Big Bang	PC 31 due by 11:59 PM 11/8 HW ch 12 due
11/12/18 M	13.3 Inflation Review	PC 32 due by 11:59 PM 11/11
11/14/18 W	Review / Presentations	PC 33 due by 11:59 PM 11/13 HW ch 13 due P4 (galaxies) due 11/14
11/16/18 F	**Exam 4 Chapters 11, 12, 13**	PC 34 due by 11:59 PM 11/15

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

Date	Topics	Assignments
11/19/18 M	Presentations	PC 35 due by 11:59 PM 11/18
11/21/18 W	**No Classes 11/22-24 Thanksgiving recess (Happy Thanksgiving!)**	
11/23/18 F	**No Classes 11/22-24 Thanksgiving recess (Happy Thanksgiving!)**	
11/26/18 M	14.1 Evidence for Dark Matter 14.2 Gravity versus Expansion	PC 36 due by 11:59 PM 11/25
11/28/18 W	14.2 Gravity versus Expansion 14.3 Evidence for Dark Energy	PC 37 due by 11:59 PM 11/27
11/30/18 F	15.1 The Search for Life in the Solar System 15.2 The Search for Life Among the Stars	PC 38 due by 11:59 PM 11/29 HW ch 14 due
12/3/18 M	15.2 The Search for Life Among the Stars 15.3 Evolution on Earth and Beyond	PC 39 due by 11:59 PM 12/2
12/5/18 W	Presentations / review	PC 40 due by 11:59 PM 12/4 HW ch 15 due P5 (where is everyone?) due December 5
12/7/18 F	Presentations / review	PC 41 due by 11:59 PM 12/6
12/10/18 M	**Friday Dec 14th, 7:30 AM LBRT 203**	
	Grades turned in by Dec 23	