

# Astronomy 100

## Principles of Astronomy

Palomar College

Course Syllabus

Spring Semester 2012

30080 (MW 9:30am/NS-136)

30081 (MW 11am/NS-136)

30819 (T 6:30pm/NS-135)

### Professor Lane

**Office:** NS-110A

**Phone:** 744-1150 x 2951

(voice mail is available 24 hours)

**email:** [mlane@palomar.edu](mailto:mlane@palomar.edu)

**Class Website:**

<http://daphne.palomar.edu/mlane>

NOTE: This course does not use the Blackboard system

**Office Hours:**

Mon 12:30p – 2:00p

Tues 5:30p – 6:30p

Wed 12:30p – 1:00p

Thurs 5:30p – 6:30p

(Additional consultation is available by appointment)

### Welcome to Astronomy!

The purpose of this class is to introduce you to the science of astronomy. My objective is to familiarize you with the nature of our Universe and how astronomers are able to turn theories and observations into an understanding of how our Universe works and our place within it. The class discussions will be a mixture of science, history and technology.

### Objectives For the Class

- ❑ Learn about what is seen in the sky.
- ❑ Learn about the nature of the stars.
- ❑ Learn about your place in the Universe.
- ❑ Understand the basic natural laws of our Universe.
- ❑ Break incorrect notions about nature and promote science literacy – i.e. Mythbusting!
- ❑ Understand how the science of astronomy is done and how astronomers learn about our Universe.

### Class Lectures

Please be aware that this course covers a large amount of material and can be difficult at times! The class lectures for this course are designed to be instructional, and will be supplemented by frequent use of illustrations, demonstrations, and short video clips. It is recommended that you take good clear class notes that will be important in studying for the exams. I will try my best to make the course as enjoyable as possible!

### Required Materials for Astronomy 100

#### 1. Textbook

The textbook required for this class is *Pathways to Astronomy – Volume 2: Stars & Galaxies 2<sup>nd</sup> Edition*, by Schneider & Arny. It is available at the **Palomar College Campus Bookstore**. A suggested reading assignment is also provided in this syllabus. The textbook will closely follow what we discuss in class and is required for a more well-rounded understanding of the course material.

#### 2. Class Lecture Notes

It has been shown that by providing the students with copies of the lecture notes used in class, students can devote much of their energy during lectures to listening and comprehension of the course content. Therefore, purchasing a packet of the lecture overheads is required and is available at the **Off-Campus Books** bookstore under the title of: *Lane, Astronomy 100 Class Lecture Notes – v10.1*.

**WARNING:** Possession of the textbook and class lecture notes is not a substitute for attending class! Much of what is necessary for comprehension of the material is discussed in class and is not provided in the notes.

## Mathematics

This course is designed to fulfill general education requirements for students who may have no special orientation toward math or science. However, mathematics is the scientist's most fundamental tool and cannot be omitted from this course. It will be assumed that all students have a familiarity with high school algebra and simple geometrical and graphical relationships. In most cases the emphasis will be placed on the mathematical concepts associated with astronomy rather than the actual number solving. Any mathematics used will be reviewed in class as needed.

## Attendance Policy

Prompt, regular class attendance is expected of you. However, I would prefer that only those students who show up to class are those who truly WANT to be here. Therefore attendance will NOT be recorded after the first two class meetings. **HOWEVER THE EXAM QUESTIONS WILL LARGELY DRAW FROM THE CLASS LECTURES AND DISCUSSIONS.**

Please be aware that the last day to drop any class without notation on your transcript is February 15<sup>th</sup>. The last day to drop a class with a "W" (withdrawal) appearing on your transcript is March 10<sup>th</sup>. After March 10<sup>th</sup>, any student that appears on my grade roster must be given an evaluative grade.

Only students who are officially registered may participate in this class. If you are given a permission code to add this class, you must officially add the class prior to the next class meeting. If you have difficulty using the College's computerized enrollment system to add, please notify the instructor immediately. The deadline for adding any class or using a permission code to add is January 29<sup>th</sup>. Under no circumstance will students be allowed to add this class after the add deadline.

**Official College Attendance Policies are listed in the current College Catalog**

## Classroom Conduct and Participation

Community College is an adult environment. I expect that you will behave as an adult. I expect your complete attention at all times. Be on time, be respectful to others, come prepared, and be prepared to participate.

- Please be sure to arrive on time. Late arrivals are disruptive to the flow of class and are disruptive to your fellow students, and will not be tolerated. Please abide by the 10-minute rule. If you cannot arrive on time, don't take this class.
- If you need to leave class early, please notify me before class begins and sit at the rear of the classroom and leave through the back door so that your departure is not disruptive.
- I will ask lots of questions during class. Your frequent participation helps me to get to know you.
- I will be offended if you sleep during class time. If you do, I reserve the right to ask you to leave the classroom.
- Cell-phones are not to be used in class and should be switched to silent mode. Please refrain from frequent text messaging – it's annoying and I will notice that you are doing it.
- Electronic music players (a.k.a. iPods or any other MP3 players) are not to be used during class time.
- The use of laptop computers is prohibited during class time. Sorry, there are no exceptions.
- Students will not be allowed to use any recording device (cell-phones, recorders, etc.) without permission.
- No photography (cell phone camera, etc.) is allowed during class time.

## **Examinations**

There will be three equally weighted exams. There are no cumulative exams – each exam will cover only the material since the previous exam. Each exam will be closed book, closed notes, and will consist of true/false, multiple choice, matching, and essay style questions. Exam dates will be announced in class at least one week prior to the exam date. All exams are one hour in length.

## **Quizzes**

There will be 2 or 3 quizzes (depending on how much time we have). Each quiz will occur between the dates of the exams. The quizzes will consist of true/false, multiple choice and matching style questions. At the end of the semester, each student will have the lowest quiz score dropped.

## **Make-Ups**

Each student is allowed ONE make-up opportunity for any one exam. Any student who finds it absolutely necessary to miss class on the day of the exam must notify me in advance (before the start of class). A make-up exam will be set up for a later date. The make-up exam must be taken before the beginning of the next class meeting. Failure to notify me in advance will cause forfeiture of any make up exams. No special projects, book reports, essays, research papers, etc. will be accepted as replacement for missed exams. ***There are no make-up opportunities for quizzes.*** If you must miss class on the day of a quiz, it will be considered your dropped quiz. There is no need to notify me of your absence for a missed quiz.

## **Pick Up Your Stuff!**

Graded exams, quizzes and homework will be brought to class. If you are absent on the day that something is returned, it is your responsibility to see me after class or during regular office hours to pick up your graded work. *It sends me a good message when you pick up your stuff!*

## **Students with Special Needs**

If you have a disability that requires special accommodation, please speak with the instructor and provide documentation within the first two weeks of class. Reasonable accommodation will be made.

## **Your Personal Responsibility**

I believe that each student determines his or her own path in my class. I hold each and every student personally accountable for the requirements of being a student in this class. Students are not “given grades”, rather – students earn the grade that they receive based upon their performance in class. The outcome of your final grade depends upon *YOU*. Your grade will be determined, in part, by your demonstration of what you have learned in this class, not by your attendance, or what you can memorize. I encourage you to work hard to achieve the grade that you desire, and to utilize me as the instructor to help you facilitate your learning – *this is your responsibility*. I expect each student to make the effort to be aware of deadlines and to abide by them – *this is your responsibility*. I expect each student to contact me immediately if there is an issue related to what is required of you in this class – *this is your responsibility*.

## **Classroom Announcements**

All classroom announcements (e.g. exam dates, assignments, extra credit opportunities, changes to the course structure, etc.) will be posted on the class website (see the web address on the first page). If you have missed a class meeting, visit the class website to find any announcements that you might have missed. Please do not call me or email me to find out if you “missed anything important” on the day of your absence. By the way... you did.

## **Academic Integrity**

I have a zero-tolerance policy for cheating and plagiarism. If you are caught cheating or if evidence clearly indicates that your work is not entirely your own, the work in question will be assigned a grade of “F” and you will be reported to the Director of Student Affairs for disciplinary action (this is the official Campus policy).

### **THIS BEHAVIOR INCLUDES BUT IS NOT LIMITED TO:**

1. Receiving/giving aid from/to a fellow student during an exam.
2. Using any unauthorized materials or devices to aid you during an exam.
3. Passing off any work as your own that is not yours.
4. Falsifying any data required for projects or outside-of-class assignments.

## **Course Student Learning Outcomes (SLOs)**

SLOs are a college-mandated obligation to measure student success. They have no impact on your grade in the course. Successful students should be able to meet the following Student Learning Outcomes:

1. Explain why the Earth experiences seasons.
2. Demonstrate knowledge of the concept of why the Moon shows phases and how its phase is related to where the Moon is in its orbit, where the observer is on Earth, and the time of day.
3. Interpret the measurable physical characteristics of a star (temperature, radius, luminosity, absolute magnitude, etc.) based on its position on the H-R diagram and determine where the Sun is located on the diagram.

*Students must also be able to describe and explain many, many other terms, concepts, and processes in order to successfully complete this class.*

## **Dropping the Class**

Dropping or withdrawing (with a “W”) from this course is *your responsibility*. If you decide to drop or withdraw from this course for any reason, you must follow the procedure outlined in the Palomar College Class Schedule. Palomar College policy states that any student whose name appears on the final class roster **MUST** be given an evaluative grade at the conclusion of the semester. **DO NOT ASSUME THAT YOUR INSTRUCTOR WILL AUTOMATICALLY DROP YOU FROM THE CLASS ROSTER.** Any petition for a late withdrawal must be handled by you through the Admissions and Records Office.

## Student Grades

Student grades will be available on the class website (the address is listed on the first page of the syllabus). The grades will be updated each time there is something graded and handed back to the students. You may access the webpage as often as you desire to keep yourself informed of your current grade status. Final grades will be posted in a similar fashion following the submission of final grades to the College Administration. ***Grades are not negotiable!***

It is your responsibility to protect yourself from errors by closely monitoring your returned work and comparing it to your grades that are posted on the website. Please notify me of any errors that you encounter. Save all computer files and returned work until you have received your final grade!

### **FINAL COURSE GRADE**

Your final course grade will be determined approximately as follows:

66%	Exams (100 points each)
9%	Quizzes (40 points each)
25%	Out of class assignments

---

100% Total  
(subject to change – with notice)

#### **CLASS CURVE:**

A's	86 – 100%
B's	76 – 85%
C's	66 – 75%
D's	56 – 65%
F's	0 – 55%

## **Tips on How to Succeed in this Class**

- Always come to class
- Take down detailed notes and diagrams
- Review the website often
- Ask questions during the lectures
- Focus on learning – not memorizing
- Use office hours if you have questions
- Stay current with the reading material
- Review your notes after every class
- Study with others
- Pay attention to the course schedule
- Do the extra credit!
- Don't be complacent about your grade

## EXTRA CREDIT OPPORTUNITIES

Extra credit points are available to be added to your overall course grade. The total amount of available extra credit is worth 3% of your overall possible grade points. The sources of extra credit are as follows:

### Attendance at the Reuben H. Fleet Science Center (in Balboa Park)

Viewing any astronomy related IMAX movie at the Fleet (or other IMAX theater). Attendance to any one movie is worth 1.5% of your extra credit. May be done more than once provided that the movie is different each time.

NOTE: Visiting the Science Exhibit Gallery at the Fleet is not acceptable for extra credit.

Call (619) 238-1233 for general information. Visit their website at <http://www.rhfleet.org> for ticket prices, show times, maps, and other information.

### Attendance at the Griffith Park Observatory and Science Center (in Los Angeles)

Planetarium Shows are offered every 30 – 60 minutes throughout each day.

Attendance to any one event is worth 1.5% of your extra credit. May be done more than once provided that the event is different (i.e. two different planetarium shows.) Visit their website at <http://www.griffithobservatory.org> for ticket prices, show times, maps, and other information.

### Tour the Palomar Observatory Hale Telescope

Public tours of the famous 200-inch Hale Telescope observatory are given every Saturday & Sunday – **April through October**. The tours are not free and often sell out. For information about price, times, and directions visit their website at <http://www.astro.caltech.edu/palomar/generaltours.html>

Attendance is worth 1.5% of your extra credit.

### **TO RECEIVE CREDIT FOR WHAT YOU DID:**

Credit will only be given upon presentation of your ticket stub (or some other proof of attendance) and a report (one FULL page typed, double spaced) describing your experience. **NO EXCEPTIONS!**

### News Articles

Bring in any article relevant to the subject matter covered in class or the textbook. Attach to the article one brief paragraph written in your own words that summarizes the article and explains how it is relevant to Astronomy 100.

- Articles must be turned in weekly.
- No more than 4 articles may be turned in at any one time.
- Each article is worth 0.2%, maximum 3%.
- Please type your paragraphs (if possible).

**Any combination of extra credit is allowed providing that it does not exceed your maximum total of 3%. All extra credit may be turned in at any time, but must be turned in no later than the last class meeting.**

**VISIT THE CLASS WEBSITE FOR MORE INFORMATION ABOUT EXTRA CREDIT**

# ASTRONOMY 100 COURSE SCHEDULE AND READING LIST SPRING 2012

<b>SECTION I: The Cosmic Landscape</b>		
Unit 5	"The Night Sky"	ALL
Unit 13	"Observing the Sky"	ALL
Unit 7	"The Time of Day"	ALL
Unit 9	"Calendars"	ALL
Unit 6	"The Year"	ALL
Unit 8	"Lunar Cycles"	ALL
<b>SECTION II: The Origins of Understanding</b>		
Unit 10	"Geometry of the Earth, Moon, Sun"	10.3
Unit 11	"Planets: The Wandering Stars"	ALL
Unit 12	"The Beginnings of Modern Astronomy"	ALL
<b>SECTION III: Celestial Mechanics</b>		
Unit 14	"Astronomical Motion: Inertia, Mass, and Force"	ALL
Unit 15	"Force, Acceleration, and Interaction"	ALL
Unit 16	"The Universal Law of Gravity"	ALL
Unit 18	"Orbital and Escape Velocities"	ALL

**EXAM 1**  
DATE: TBA

<b>SECTION IV: Remote Measurements</b>		
Unit 21	"Light, Matter, and Energy"	21.1
Unit 22	"The Electromagnetic Spectrum"	ALL
Unit 23	"Thermal Radiation"	ALL
Unit 55	"The Temperatures and Compositions of Stars"	55.2
Unit 24	"Atomic Spectra: Identifying Atoms by Their Light"	ALL
Unit 26	"Detecting Light"	ALL
Unit 27	"Collecting Light"	ALL
Unit 28	"Focusing Light"	ALL
Unit 29	"Telescope Resolution"	ALL
Unit 30	"Earth's Atmosphere and Space Observatories"	ALL

<b>SECTION V: Stellar Properties</b>		
Unit 54	"Light and Distance"	54.1, 54.2, 54.4
Unit 56	"The Masses of Orbiting Stars"	ALL
Unit 57	"The Sizes of Stars"	57.3
Unit 52	"Surveying the Stars"	52.2
Unit 54	"Light and Distance"	54.3
Unit 55	"The Temperatures and Compositions of Stars"	55.1, 55.3 – 55.5

**EXAM 2**  
DATE: TBA

Unit 58	"The H-R Diagram"	ALL
<b>SECTION VI: Stellar Evolution</b>		
Unit 59	"Overview of Stellar Evolution"	ALL
Unit 60	"Star Formation"	ALL
Unit 50	"The Sun's Source of Power"	50.1 – 50.2
Unit 61	"Main-Sequence Stars"	ALL
Unit 62	"Giant Stars"	ALL
Unit 64	"Mass Loss and Death of Low Mass Stars"	ALL
Unit 65	"Exploding White Dwarfs"	65.2
Unit 66	"Old Age and Death of Massive Stars"	ALL
Unit 67	"Neutron Stars"	ALL
Unit 68	"Black Holes"	68.1 – 68.3

<b>SECTION VII: Galaxies</b>		
Unit 70	"Discovering the Milky Way"	ALL
Unit 71	"Stars of the Milky Way"	71.1
Unit 74	"A Universe of Galaxies"	74.1
Unit 75	"Types of Galaxies"	ALL

<b>EXAM 3 (FINAL EXAM)</b>			
<u>Section</u>	<u>Normal Class Time</u>	<u>Exam Date</u>	<u>Exam Time</u>
30080	MW 9:30am	W 5/16	10am
30081	MW 11am	M 5/14	10am
30819	T 6:30pm	T 5/15	6pm

*Semester Holidays*  
**Washington's Birthday: Mon. 2/20**  
**Spring Break: 3/19 – 3/23**

# Official Syllabus Agreement

**Astronomy 100**

**Professor Lane**

**Palomar College**

(print your name) \_\_\_\_\_ Spring Semester 2012

I have received, read and understand the syllabus and course description provided by Professor Lane for the above listed class. Specifically, I have read and understand the procedures for class attendance, participation, exams, missed exams, and accessing the Astronomy 100 webpage. I realize that this syllabus is an agreement between me and the professor, a contract that exists to protect both of our rights as student and teacher. I understand that the course schedule is tentative and that the only way to determine schedule changes and/or specific course requirements is to attend class. In the event that I miss class, I am fully aware that I risk missing important information, homework assignments, and updates that may directly impact on my final course grade. I am aware of my personal responsibilities as a student and what is required of me to be successful in this course and I will comply with all of the procedures declared in the syllabus.

(your signature) \_\_\_\_\_ Date \_\_\_\_\_

**Complete and return to the instructor AFTER the first day of class and AFTER you have fully read the syllabus. Failure to complete and turn in this form will result in being automatically dropped from the course.**