

## Introduction to Stellar Astronomy, PCS 112/ Lab Course 113

**Instructor: Mr. Bobby Timms, A.S., B.S., and M.A.**

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Office Hours: By appointment (I am on campus on Tuesday and Thursday mornings).

The Astronomy course meets on Tuesday and Thursday from 8:00 a.m. until 9:15 a.m. Attendance is taken at each class meeting. The lab course is on Tuesday from 9:30 a.m. until 12:15 p.m.

**Required Textbook:** OpenStax Astronomy found in Starry Night software.

You will need to purchase the Starry Night eBook which is the software that contains the Open Stax Astronomy textbook. The link for purchasing the software directly is [orders@simcur.com](mailto:orders@simcur.com) or can be purchased through the bookstore. The Starry Night eBook will be used in lab sessions and for reading exercises.

**Required Resources:** In addition to the Starry Night software, we will be using Expert TA, a homework assignment and management system for Astronomy. Expert TA is integrated with the Canvas course management system. You can purchase access to Expert TA with a credit card the first time you access an assignment through the course management system Canvas, for \$35. Do not copy and post Expert TA problems to the internet searching for solutions.

**Note:** Access to a computer or tablet with internet access is required to complete assignments in class as well as outside of class.

**Expert TA terms of Service:** Expert TA problems are copyrighted. It is expressly forbidden in Expert TA's Terms of Service (TOS) for a student to post this copyrighted material. Violating the TOS can result in discontinuation of the student's Expert TA account.

### Overview

Each section will include some or all the following: PowerPoint lecture notes, reading assignments, vocabulary quizzes for each chapter, homework assignments and quizzes through Expert TA. All assignments will be made through the course website on Canvas. Expert TA assignments and eBook Starry Night exercises will be automatically graded. Labs will be assigned, and detailed instructions provided. Missed work should be completed and is subject to the given deadlines for credit. All missing or late work is not accepted after the deadlines for making up work during the Semester.

There will be three exams as shown below and a final astronomy vocabulary exam given at the end of the semester. The three in class exams and Semester exam will be administered

**through Expert TA. Vocabulary quizzes will be given at the beginning of every chapter during the lecture.** Once you start the three exams you will have a fixed amount of time to complete. There will be time pressure, so you need to know and understand the material before taking the exam. Everyone will have a different exam with randomized variables and randomized problems.

Attendance will be taken at the beginning of each class lecture and lab class period. You will receive one point per attendance to each class and lab class. Attendance/participation will be graded out of the points received for the total number of points possible for this category. On test days, students do not come to lecture class but complete the tests in expert TA.

***No final changes to grades will be made after the exam (adding points to raise the grade).***

**Exam Dates** - exact dates will be given one week before the test is scheduled. Tests are completed in expert TA.

February 8, 2023

March 14, 2023

April 18, 2023

**Grading:**

|  |     |
|--|-----|
| Homework, Labs, Quizzes,<br>Starry Night Exercises, etc. | 20% |
| Vocabulary Quizzes                                       | 10% |
| Attendance/Participation                                 | 10% |
| Exam (4)   | 40% |
| Final Exam   | 20% |

**Grading Scale:**

90+ A

80 – 89 B

60 - 79 C

60 – 70 D

0 – 60 F

**Content**

Astronomy is the study of the Universe through observation and experimentation. We will start by developing a model of the solar system, use that model to understand why there are phases of the moon and why we experience seasons. We will explore the methods of specifying locations (coordinate systems) on the surface of the Earth and in the sky. We will study the

electromagnetic spectrum of light as the source of the information we have about the cosmos. We will study the Sun and other stars and how they behave, live, and die. We will; explore collections of stars; binary stars, clusters, and galaxies. Using Hubble's Law, we will calculate the recession speed of distance galaxies and ultimately calculate the expansion rate of the Universe, Hubble's Constant, and the age of the Universe. Using Universal expansion as a start we will develop the basis for the "Big Bang Theory." Finally, we look at the composition of the Universe introducing the concepts of Dark Matter and Dark Energy.

**Purpose:**

**The purpose of this course is to provide non-science majors with an overview of astronomy as an example of the methods of a hard science.**

**Student Learning Objectives (SLO)**

**To Understand.**

1. the process and methods of science and science's impact on our lives
2. the phases of the moon
3. the cause of the seasons
4. the motions of objects in the sky, Moon, planets, stars, galaxies.
5. the electromagnetic spectra, its sources, and significance in astronomy
6. the formation, birth and death of stars and their remnants
7. the formation and types of galaxies and other collections of stars
8. the large-scale structure of the Universe
9. the Standard Model Big Bang Theory and the evidence that supports it
10. The energy-matter composition of the Universe, including dark matter and energy

Understanding will be demonstrated by successful completion of assignments, lab exercises, and exams.

**Academic Integrity**

All students are expected to adhere to the highest standards of academic integrity, and to abide by the Reinhardt Honor Code. Also, all students are expected to be familiar with the Reinhardt policy on academic dishonesty stated in the University Catalog and in the Student Handbook. Plagiarism (using the ideas and phrases of others without crediting them, therefore claiming

those ideas and phrases as your own) will not be tolerated in this course or on this campus. To avoid such academic dishonesty, you must use a citation (footnote or in text) for all ideas drawn from your reading and research, including research in encyclopedias and online, even when you have restated those ideas in your own words.

General: The homework, quizzes, and exams administered through Expert TA are ACADEMIC SUPPORT OFFICE Disability Statement.

**The Americans with Disabilities Act (ADA)** is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. This legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. Reinhardt University is committed to providing reasonable accommodations for all persons with disabilities. Therefore, if you are seeking classroom accommodations under the Americans with Disabilities Act, you are required to register with the **Academic Support Office (ASO)**. ASO is in the basement of Lawson Building. To receive academic accommodations for this class, please obtain the proper ASO letters.

### **Roles and Responsibilities:**

In this course it is my responsibility to find ways to help you learn and understand the fundamentals of astronomy. Your responsibility is to actively engage in learning by investing the time and energy required to master the material. To learn is an active verb. So, learning is something you do. It is my objective to rekindle in you an awe for the majesty of our physical world (that feeling you had as a child when you lay in the grass in your backyard and stared up at the sky) and how astronomers try to understand and explain its beauty and complexity.

My overall goals for you in this course: I want you to understand the nature of science through the eyes of astronomy and the big ideas and methods of astronomy. You will demonstrate your mastery of the material by successfully completing; assignments, quizzes, labs and exams based on the material presented, resources outside of the class, and the textbook.

**This syllabus is subject to change without notice.**

Covid 19 statement for syllabus:

Reinhardt University's COVID-19 Policy applies to all students, faculty, staff, administration, and guests. The policy is subject to changes based on conditions and guidance from CDC, state, and local health experts. Current policies and procedures can be found at: <https://www.reinhardt.edu/back-to-campus>. If you have any questions, please refer to the website or contact Reinhardt University at the numbers below.

### **Campus Nurse within the Student Health Center**

[studenthealthcenter@reinhardt.edu](mailto:studenthealthcenter@reinhardt.edu), 770-720-5542 or [www.reinhardt.edu/nurse](http://www.reinhardt.edu/nurse).

### **Public Safety**

**Non-Emergency Phone:** 770.720.5789 **Emergency Phone:**  
770.720.5911 [publicsafety@reinhardt.edu](mailto:publicsafety@reinhardt.edu)

**Dean of Students** [deanofstudents@reinhardt.edu](mailto:deanofstudents@reinhardt.edu), 770-720-5540

**Office of the Vice President for Academic Affairs** [VPAA@reinhardt.edu](mailto:VPAA@reinhardt.edu), 770-720-9102