ASTR 100L

Introductory Astronomy Laboratory

Tuesday, 8:00 am - 10:45 am, HSCI 278

Katy Wimberly
Email: katy.r.wimberly@gmail.com
Office: HSCI 251
Office Hours: Wednesdays & Fridays 12:45 - 1:45 pm -or- by appointment

Schedule & syllabus are subject to change. In the event of a change, you'll be notified in advance.

Course Description: This lab course will provide an understanding of astronomical coordinates, star maps, magnitude, spectral classification, ages of stars, distance to star clusters and more!
Prerequisite(s): One course from Category B.2 of GE requirements; ASTR 100.
Note: Knowledge in high school level algebra is assumed.
Units: 1

Required Text: *Astronomy Online Laboratory*, 4th Edition, **Author:** Gordon
Recommed Text(s): *21st Century Astronomy*, 4th Edition, **Author(s):** Kay *et al*, **-Or-** Other freshman level astronomy textbook

Course Objectives:
While Astronomy 100 lecture & lab courses are independent classes, some topics and ideas will overlap. At the completion of this course, students will be able to :

1. Understand how we observe the universe;
2. Distinguish between Earth & Astronomical coordinate systems;
3. Understand basic dynamics of our solar system and the Earth-Moon system;
4. Use & read star maps;
5. Understand and describe the historical importance & uniqueness of major constellations;
6. Perform calculations and analysis on astronomical data;
7. Understand the motion's of the Earth affect the appearance of the sky on a daily & yearly basis;
8. Understand the consequences of observing the sky from a rotating reference frame & calculate the length of time it takes Earth to rotate once on its axis;
9. Understand properties of star clusters and to determine their distance;
10. Understand & describe properties of stars: size, mass, distance, age, spectral class, luminosity, & magnitude;
11. Measure the mass of planetary bodies & explain how this skill relates to the search for extrasolar planets;
12. Understand the basic nature of light & the principles of spectroscopy;
13. Understand the Big Bang Theory & how to estimate the age of the universe.

Grade Distribution:

Participation	15%
Homework	30%
Labs	15%
Project	15%
Final Exam	25%

Letter Grade Distribution:

>= 90.0%	A
89.9% - 80.0%	B
79.9% - 65.0%	C
64.9% - 50.0%	D
<= 49.9%	F

Course Policies:

- **General**
  - Please bring to each class meeting:
    - A scientific calculator (containing trig functions & logs);
    - A flash drive;
    - A laptop or tablet (if you have one);
    - Paper or a notebook for recording data & doing calculations;
    - Lab manual.
  - UNDER NO CIRCUMSTANCES IS FOOD OR DRINK ALLOWED IN THE LAB (classroom). THERE ARE NO EXCEPTIONS TO THIS SAFETY RULE.
  - **No makeup labs or exams will be given.**
    **Some extra credit opportunities may be available.*
  - Withdraw and add policies for this course as part of the College of Natural Science and Mathematics are the same as the University Withdraw Policies.
  - It is your responsibility to add, drop or change your classes. *Reminder:* This can be done through MyCSULB.

Course Policies (con't):

- **Labs and Assignments**
  - Experiments, lab work and the project will be conducted in groups of 3 or 4. Instructing each other is strongly encouraged and equal participation from each group member is required. Submitting group homework and one lab report per group is highly encouraged, too.
  - If you miss **two** activities you automatically fail this course.
  - Each assignment **must** have the name of each group member (4 max) on the first page.
  - Assignments are due at the beginning of class the week it is due.
  - **No late assignments will be accepted** except due to University approved absences.
  - Cheating on assignments or the final exam and plagiarism on homework, lab reports and project are serious offenses. This course and any assigned work follow the Academic Integrity rules laid out in the 2015-2016 University Catalog.
    - Remember referenced work must be clearly cited.
  - The final exam is **not** collaborative.
  - Accommodation of a Disability: If you have a disability, it is your responsibility to notify your instructor in advance of your need for accommodation of that disability that has been verified by the University.
- **Attendance and Absences**
  - Since participation is a large part of your final grade, attendance is just as important.
  - Students arriving more than 15 minutes late will be marked Tardy and lose partial participation points.
  - Turning in an assignment without physically participating in the original activity will result in a score of 0.
  - The Department of Physics and Astronomy expects attendance at all labs without exception.
  - If you are unable to attend the lab due to a legitimate concern (University approved absence), it is your responsibility to e-mail your instructor about it.

Lab Schedule:

Week	Content	Assignment	Due
1 01.19 - 01.23	• **First day of class** - Syllabus, Safety, Math Review	Homework 1 Math Review	Week 2
2 01.24 - 01.30	• Coordinates • Astronomical Coordinates Activity	Homework 2 Coordinates	Week 3
3 01.31 - 02.06	• Sidereal Time, Solar Days & Lunar Phases • Sidereal Time Activity	Homework 3 Sidereal, Solar & Lunar	Week 4
4 02.07 - 02.13	• Inverse Square Law Hands-On Lab & Lab Reports Overview	Lab Report 1 Inverse Square Law	Week 5
5 02.14 - 02.20	• Sidereal Time, Star Charts, Constellations & Star Trail • Star Charts Activity	Homework 4 Star Charts & Project Proposal	Week 6
6 02.21 - 02.27	• Arcturas, Earth's Revolution & Seasons • Arcturas & Earth's Revolution Activity	Homework 5 Earth's Revolution & Seasons	Week 7
7 02.28 - 03.05	• Online Spectroscopy & Habitable Zones • Spectroscopy Activity	Homework 6 Spectroscopy & Habitable Zones	Week 8
8 03.06 - 03.12	• Hands-On Spectroscopy Lab	Lab Report 2 Spectroscopy	Week 9
9 03.13 - 03.19	• Distance to Pleiades, HR Diagram & Mass-Luminosity Relation • Distance to Pleiades Activity	Homework 7 Distance to Pleiades & HR Diagram	Week 10
10 03.20 - 03.26	• Projects Presentations!	None!	n/a
11 03.27 - 04.02	• Enjoy Spring Break!	None!	n/a
12 04.03 - 04.09	• Kepler's Laws & Extrasolar Planets • Kepler's Laws Activity	Homework 8 Kepler Activity & Unanswered Question Report	Week 13
13 04.10 - 04.16	• Distance & Age, Cosmic Distance Ladder • Distance & Age Activity	Homework 9 Age & Cosmic Distance	Week 14
14 04.17 - 04.23	• Hubble's Laws, Lookback Time & Redshift • Hubble's Laws Activity	Homework 10 Hubble, Redshift & Study Guide	Week 15
15 04.24 - 04.30	• Quasar 3C273 & Variable Stars • Quasar Activity	Homework 11 - Quasars Final Exam Review EC	Week 16
16 05.01 - 05.07	• Review for Final	Study hard!	n/a
17 05.08 - 05.14	• Final Exam 05.12 from 8 - 10 am	Enjoy Your Summer!	n/a