Astronomy 110L, Section 2: Survey of Astronomy Laboratory

Meeting Information:
Every Wednesday, 19:00 - 22:00
Physical Science Building, room 112
and other outdoor locations

Instructor:
Mike Lum,
lummi@hawaii.edu
Main office: Institute for Astronomy, B-227
2680 Woodlawn Dr.
Campus office: Watanabe Hall, 403
Hours: W: 12:30-14:30, or by appointment

Teaching Assistant:
Kelly Blumenthal
kblumy@ifa.hawaii.edu
Main office: Institute for Astronomy, C-233
2680 Woodlawn Dr.
Campus office: Watanabe Hall, 421
Hours: Thursday, 9:00-12:00

Other Course Communication:
myUH e-mail - Read it, love it, forward it to your main account.
Laulima for some course material and all grades

Important Dates:
Wednesday, August 26: First class (Mandatory!)
Monday, August 31: Last day to drop, without a “W”
Wednesday, September 2: Last day to add
Friday, October 23: Last day to drop, with a “W”
Wednesday, November 11: Veterans’ Day (No Class)
November 26-27: Thanksgiving Break
Wednesday, December 9: Last class (All work is due)

Course Description:
An introduction to observing the night sky, using naked-eye observations, binoculars, telescopes, and other tools. The student should expect to gain a basic familiarity with common, bright, night sky objects, and the ability to find fainter objects, using charts and astronomical coordinate systems.
Students should also expect to gain an understanding of scientific methods and how observations evolve into scientific discoveries. Students will also use a suite of astronomical instruments including telescopes, spectroscopes, astronomy software, digital cameras, and others as needed. Various other astronomy-related topics including, but not limited to, mythology of Hawaiian and other cultures, astrology, statistics, cosmology, among others may be discussed during class time.
Equipment:

  
  UHM Bookstore: $19.95 (new) / $15.20 (used)
  
  Amazon: ~$14.00 (new) / $5.00 (used) + shipping

**Other (required):**
  
  Writing implement
  
  Notebook (bound or looseleaf)
  
  Scientific calculator (Smartphone apps are O.K.; a real calculator is best.)

**Recommended:**

- Stellarium Planetarium software ([http://stellarium.org](http://stellarium.org)) It’s free!
- Warm clothing
- Closed-toe shoes
- Insect repellant
- Warm beverage
  
  - caffeinated, legal stimulants are o.k.
  
  - alcoholic, or otherwise prohibited - not o.k.
- Clipboard
- Head-mounted light with red bulb(s)
- Digital camera

**Provided:**

- Specialized observation equipment
  
  (ie: Telescopes, binoculars, etc.)

Grading:

75% Labs (12-14), 25% Lab Preparation & Quizzes

Course grades will be on a standard scale:

- A : 90%+
- B : 80-89%
- C : 70-79%
- D : 60-69%
- F: Below 60%

Plus/minus grades may be awarded at the instructor’s discretion.

Lab reports must be submitted, either electronically or in person, by the beginning of the following lab period, or by the date listed on the assignment sheet for full credit. Late labs will receive partial credit.

Lab Safety:

Astronomy labs do not require any additional safety equipment purchases or considerations. If used improperly, some equipment may cause blindness (don’t look at the Sun through binoculars or telescopes!), and we will visit outdoor locations, off of paved roads and sidewalks. Students will be alerted to other dangers and hazards by the teaching staff as they arise.

Lab Preparation and Quizzes:

A portion of your final grade will be on your preparation for lab each week. You will be expected to turn in a completed “Preparation Quiz” at the beginning of some lab periods, when assigned. I will elaborate more on these assignments during our first class. In addition, there will also be a number (<10) of “regular” quizzes meant to assess your mastery of topics we have covered in prior labs. These quizzes will be announced in advance.
**Attendance:**
Attendance at all lab sessions is mandatory, unless otherwise stated in class. On average, each lab period contains materials which contribute 7% of your final grade. Missing a lab can have a substantial effect on your final grade! Missed labs and quizzes may not be completed at a later date. However, a small number of make up labs are available.

**Carpooling:**
In Manoa, weather conditions and light pollution prevent us from offering satisfactory outdoor observational experiences. We will do most of our observations from a nearby, darker site. This means that we will need to travel to one of several locations. I prefer to use the soccer fields in Kapiolani Park, as it is relatively nearby, has parking, and is relatively safe. We can provide transportation for only a few students, and ask for students to volunteer to carpool to our outdoor locations.

**Independent Work:**
While students will gather data and make observations in a lab group, **all submitted work must be original**! You can work together with your lab partners, but your words must be your own. Furthermore, many observations will require a **subjective** measurement, which will often vary from student to student. When answers are shared between students, I will “share” the score between those same students. For instance: Three students have the same answers on a thirty point lab. I determine that the overall lab was pretty good, and worth 27 points. Each of the three students will receive $27 \div 3 = 9$ points out of 30 for the lab.

**Extra Credit and Make-Up Work:**
There are extra credit points available on most labs. Completing an extra credit problem or task will contribute a small number of points to that lab’s grade. Make-up labs are available for a **limited** number of missed labs (1-2 only). Make-up labs may cover new, or different material from the main labs, and are designed to take the student **twice** the amount of time as a regular lab. Furthermore, I use make-up labs to try out new material, so a student requesting a make-up lab is considered a volunteer “lab rat”.

**Students with Disabilities:**
The University of Hawaii offers a great deal of free assistance for students with various disabilities. The KOKUA Program offers services like: ASL interpreters, note taking, extended test periods, among many others to assist with student success. Any student who feels s/he may need an accommodation based on the impact of a disability is invited to contact me or the KOKUA Program, privately. I would be happy to work with you, and the KOKUA Program (Office for Students with Disabilities) to ensure reasonable accommodations in my course. KOKUA can be reached at (808) 956-7511 or (808) 956-7612 (voice/text) in room 013 of the Queen Lili‘uokalani Center for Student Services.

**Student Athletes:**
Student athletes who expect to miss classes due to travel are issued an official University form which needs to be submitted to the instructor **prior to the expected travel dates**.
Schedule:
Material to be covered each week will vary with the weather. We would like to go outside every week, and take the opportunity to practice our observation skills - Nothing beats the “real thing”.
However, we cannot control the weather and therefore, cannot predict what material will be covered at which date. Some sample topics are listed below.

Lab Topics:
(Note: Subject to change due to weather, equipment, site, and many other uncontrolled variables)
(I) = Indoor Activity, (O) = Outdoor Activity, (L) = Long-term (> 1 wk)

<table>
<thead>
<tr>
<th>Telescopes: Orientation (Week 1) (I)</th>
<th>Limiting Magnitudes (O)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telescopes: In-the field (O)</td>
<td>Sky Motions (I)</td>
</tr>
<tr>
<td>Naked-Eye Observing (O)</td>
<td>Open Clusters (O)</td>
</tr>
<tr>
<td>Desktop Observing (I)</td>
<td>Globeral Clusters and Galaxies (O)</td>
</tr>
<tr>
<td>Lunar Features and Appearance (O), (I)</td>
<td>Deep Sky Treasure Hunt (O)</td>
</tr>
<tr>
<td>Light and Spectra (I)</td>
<td>Solar Observing (L)</td>
</tr>
<tr>
<td>Motion of the Moon (L)</td>
<td>Kepler’s Law(s) (I)</td>
</tr>
<tr>
<td>Phases of the Planets (I)</td>
<td>Variable Stars (L)</td>
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<td>Parallax (I)</td>
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