

# Lab Guidelines

## Fall 2018 specific notes

- Let me know by approx 9/21 which days you'd like to have an ATA, and if you prefer 2 or 3 visits. Visits will be October and early-mid November.
- Mars and Saturn are up; Saturn departs night sky after ~1-2 months.
- Total lunar eclipse Jan 21, 2019 (thanks to Tomer for noting)
  - MLK day / before start of classes, but maybe tell your students

## Lab Content

### Requirements

- 11 three-hour labs each semester
- "Fall" Lab = Lab 1 = Earth, Moon, & Planets / Life in the Universe
- "Spring" Lab = Lab 2 = Beyond the Solar System / Stars, Galaxies, & Cosmology

We expect students to:

- Ask questions about the natural world that can be tested by experiments or observations.
- Analyze and synthesize sources of scientific information to assess what is known, or what can be known, about the natural world through the scientific process.
- Practice methods of scientific observation, experimentation, data collection, quantitative reasoning, critical thinking, interpretation, and analysis.
- Develop an understanding of the role of skepticism and uncertainty in science.
- Communicate scientific results and analyses in appropriate visual, quantitative, or written forms.

From Barnard's "Foundations" (pre Fall 2016) requirements for laboratory classes.

### Designing Labs

- See the [wiki](#) for a list of standard labs and resources to write your own labs
- Be aware that your students are in different lecture classes. For spring labs, students taking Stars/Atoms will not cover galaxies, so try not to have >~3 labs on galaxies/cosmology. When you do teach galaxies, try to frame within the broader physics so Stars/Atoms students are not lost; e.g. when discussing Hubble's Law emphasize Doppler shifts.
- You can choose the order in which you do labs. It's helpful to the students if they are organized in some logical way or if you try to link them together.
- Students appreciate it when the lab material reinforces the lecture material. You can use [lecture syllabi](#) to coordinate your labs.

- Surveys of students suggest that their enjoyment of each lab depends on the lab's topic rather than the activity/method used. Instructors should try to present the topic as interesting and make sure that the students understand the science behind the lab in addition to the method used.
- Please post new or substantially revised labs to the wiki so that everyone can use them.

### Students

- Wide range of levels / interest in science. Be sensitive to this.
- Find out what lectures they are in.
- Many lab instructors hand out a questionnaire to ask year, major, math/science background.
- Barnard and Columbia each have disability service offices. Encourage students to register early if needed to ensure access to resources (screen readers, dictation, time on tests/quizzes, ...). Registration is confidential.

### Observing

- Observing TAs will contact all lab sections every Sunday to discuss the possibility of doing an observing lab that week (and which lab(s) can be done)
- Lab TAs conduct the indoor part of lab and grade the entire lab.
- Observing TAs run the outdoor part of the labs, but lab TAs should be ready to assist.
- Remind students to dress warmly.
- Telescope training: talk to observing TA, roof manager, or outreach coordinator

## Lab Logistics

### Start of Semester

- First week of classes: email students telling them
  - what to bring to lab
    - writing implements, lab notebook, calculator (we don't have enough for two full labs each night), maybe a ruler
  - when/where lab starts
  - first lab attendance is required to enroll unless they tell you in advance
    - will drop registered students that are absent first day without excuse
  - to register for sections that minimize religious holiday conflicts, if possible
- First lab attendance is handled by the head TA.
- Check the Courseworks roster for the first 3 weeks to make sure (1) everyone registered is attending, and (2) everyone attending is registered. This is harder to fix later in the semester. Alert the head TA if there is a discrepancy.
- If students have trouble adding or swapping lab sections, refer to head TA and/or Laura
- Courseworks' photo roster is helpful for memorizing names.

## Scheduling

- If you cannot teach a section, please have someone cover or move your section with students' assent. We must provide some minimum number of class hours per course credit.
- Be cognizant of holidays, in particular Jewish High Holy Days ~ September.
  - Fall: Rosh Hashanah, Yom Kippur, Sukkot, ??
  - List of religious holidays: <https://barnard.edu/node/2067>

## Assistant TA (ATA) Visits

- Each lab gets 2 or 3 ATA visits in Oct & early Nov (Fall) and late Feb & March (Spring).
- Let the head TA know which days you would like to have an ATA.
- Assignments are posted on the wiki.

## Grading Basics

- Lab grades are separate from lecture grades. The lab is 1 credit, so the grade has minimal impact on GPA.
- Each lab section should have an average grade of A- / B+.
- No more than 75% of the class should have an A or A-. 25% should have below an A-.
  - Laura Kay said she would double check.
- You should drop each student's lowest lab grade. Students who attended every week drop their lowest grade; a student that misses one lab gets a zero which is dropped.
- Students generally appreciate being given their lab average at mid-term.

## Grading Options

- Lab notebooks usually count for the majority of the grade.
- Tell your students how you will grade their notebooks and what specifically you are looking for.
- In your syllabus, give a detailed description of how you will grade your students, and stick to it all semester.
- Some instructors include a participation grade based on some combination of preparation, timeliness, oral participation, and attitude.
- Some instructors give brief quizzes in the beginning of class.
- Some instructors have students present topics of their choice in the last lab. If you do this, you must give your students one week off from lab to prepare the presentation, so that the total time spent on lab is no greater than 33 hours per semester.

## Attendance

- Since lowest grades are dropped, students may miss one lab without consequence.
- It is university policy that we must fail any student who is absent three times. Remind students of this if they have missed two labs. Alert the head TA if a student is in danger of failing.
- Official policy is to *not* allow makeups if students are absent. Instructors may use their discretion.

- If a student misses lab for a religious holiday, you must let them make up the lab.
- If a student misses lab and you are notified by the dean of extenuating circumstances (family emergency, health issues), you must let them make up the lab.
- Makeup options:
  - Attend another lab section (usually difficult because of scheduling issues)
  - AMNH visit
  - Watch and write a report on a NOVA episode or news story
  - Do a lab at home that doesn't require any special equipment

### **Suggestions for Running Labs**

- Students generally work in pairs. Sometimes it's nice to make them work with a new lab partner each week so they get to know different people in the class.
- It is often helpful to start each class with an introduction to the material so everyone is on the same page. Remember that students are not in the same lecture classes and do not have the same background.
- It is helpful to bring the class together throughout the lab to discuss any problems together.
- It could be nice to end with a discussion of the results, but this is hard to do when students work at different paces.

### **Supplies**

- Supplies are in the lab cabinets (Pupin 1402) and listed on the [wiki](#) (needs an update).
  - Old laptops (~2010) and dongles??? are in file cabinet in Pupin 1410.
  - Roof keys, eyepieces, and cameras are also in Pupin 1410.
- [Seven lab laptops are in the undergrad office, in a rolling cart.](#)
  - [Cart lock code: 1987](#)
  - [Username: astrolib, password: pupin1402](#)
- Tell the head TA if there are materials you think would be useful to buy.
- Labs in the classroom can switch to library on nights when they want to use laptops
- [Overlapping lab sections: touch base with the other TA before you commit to doing labs that require specific equipment.](#)

### **Version history**

- Sep 2018 updated
- Sep 2012 written by Jenna