

ISP205L
Visions of the Universe Laboratory
Fall 2005 Syllabus

www.pa.msu.edu/courses/ISP205L

Course Goals.

Our major goal is to improve your understanding of how science actually works. The physical sciences are based on measuring what happens in nature, and then continually refining our description of the underlying rules that govern those phenomena so as to better match the observations and to allow improved predictions of how things will behave in the future. For example, over the past 2+ thousand years our understanding of the laws of motion has progressed from the vague ideas of the ancient Greeks through a series of ever-better quantitative descriptions by Kepler, Newton, and then Einstein. These results and similar progress in other areas of the physical sciences furnish the underpinnings of our technology-based civilization. But Mother Nature has been doing whatever it is she does in exactly the same way for many billions of years, irregardless of whether or not humans were there to measure it or claim to understand it. This lab will try to clarify the relationship between what actually happens, measurements, and understanding.

A secondary goal of the course will be to introduce you to the Night Sky, by using the Planetarium to teach you how to recognize the major constellations and the brightest stars. This is a bit of cultural background that many students enjoy learning and then knowing for the rest of their lives.

Instructors.

Supervising Professor: Jack Baldwin, baldwin@pa.msu.edu, Office: 3270 Biomedical Physical Sciences Building, phone 355-9200 x2411. Office hour: Tu 10-11.

Teaching Assistants: (office hours TBD).

Kim Dupczak (dupczakk@msu.edu)

Aparajita Sengupta (sengupta@pa.msu.edu)

Angelo Varlotta (varlotta@pa.msu.edu)

Matt Steele

David Ventimiglia

Each section will have a permanently-assigned "Lead TA", who will be the person in charge of the section (including determining your grade). There will also be a second, and as needed a third, TA during each section meeting. In addition, Professional planetarium lecturers will lead the parts of the sessions in which you look at the "sky".

Planetarium Personnel:

David Batch, Director

John French

Shane Horvatin

Office Hours, and e-mail Help Desk.

Each TA has a desk in room 3265 Biomedical Physical Sciences, phone 355-9200 x2445. Office hours will be announced on the course web site (www.pa.msu.edu/courses/ISP205L) and in class during the first week of classes. We also run an e-mail help desk at isp205lab@pa.msu.edu. Its hours of operation will also be announced during the first week. You can go to the help desk or to any TA if you have questions about how to do assignments, etc. But you should only go to your Lead TA if you want to talk about your grades.

Required materials.

Book: Astronomy Media Workbook (Fourth Edition) for the Cosmic Perspective, by Michael LoPresto.

Software: Voyager Sky Gazer, College Edition (from Carina Software). Included with *The Cosmic Perspective* textbook used in the ISP205 lecture course. Look for the CD envelope inside the front cover. If you buy this textbook used, be sure to find one that still has the CD in it. If you are not currently taking the ISP205 lecture course, talk with your lead TA about how to best obtain a copy of this software, which is needed to do the homework.

HiTT Infrared Clicker: Rebate coupons are bundled both with the Astronomy Media Workbook and with the textbook for the ISP205 lecture course. The same clicker may be used in more than one course. Either the 6 or 12 button varieties will work.

Clipboard or stiff notebook, so that you can fill out papers and reports in your lap. Also, always bring blank sheets of paper (lined is best), and a pen.

Section Angel Sites and Course Web Site

Each section has its own Angel site, reached from www.angel.msu.edu. Items specific to you or to just your section will appear here. These include: (under the “LESSONS” tab) the forms for registering your clicker and the answer sheets that you will use to electronically submit your homework; and (under the “TOOLS” tab) your grades. You will also see occasional “Announcements” after you log into the Angel page for your section.

In addition, there is a general course website that will be updated throughout the semester with information that applies to all of the sections. It is at www.pa.msu.edu/courses/ISP205L, or you can get to this same page by clicking on the Angel “COURSE WEB SITE” tab.

Meeting place.

The course will meet from 3:00-4:50PM in the Planetarium for the first 11 weeks. Then it will meet in various computer microlabs on campus for three weeks. The final session for sections 1, 2 and 3 (M, TU and W) will be back in the Planetarium, but Section 4 (TH) will meet in computer labs that last week to make up for having lost a week due to the Thanksgiving holiday. It is anticipated that the full time period will be needed for almost all sessions.

Typical Planetarium Session.

- Review of previous week’s homework assignment, including clicker questions: 10 min.
- Learning constellations/brightest stars: 20 min
- Use Planetarium to demonstrate observed phenomena: 30 min.
- Explanation in terms of modern physics (including clicker questions): 30 min.
- Report write-up: 20 min.

Special Rules for the Planetarium.

- Arrive on time (we must lock the doors when the Planetarium is in darkness).
- If necessary for emergency reasons, you can leave during a dark session. But you can’t come back in.
- Absolutely no food or drinks. We will ask you to leave if you have them.
- Cell phones and pager shut *off!* (offenders will be beamed to α Centauri after suitably withering glares from the rest of the class).
- No lights when it is supposed to be dark.
- Don’t talk while the TA or lecturer is talking. Sound bounces around in funny ways.

Rules for Clickers.

- It's up to you to have a working clicker. They sell out fast, so get one right away. Carry a spare battery.
- You can *not* click in answers for anyone else by, for example, using two clickers. That would be grounds for dismissal from the course.
- Submit your clicker number using the form we will provide on Angel. We must know your clicker number in order to associate it with your name. It is beneath the battery.
- If you lose your clicker, get a replacement right away and send an email to isp205lab@pa.msu.edu telling us the new number.

Computer Lab Sessions.

Three of the lab sections will be held in some of the general micro-labs that are spotted around campus. In each case, your section will be split between two rooms, each under the guidance of its own TA. The room assignment schedule is complicated (due to room availability constraints), and will be announced on a section-by-section basis a week or more ahead of time. During these labs, you will team up (typically two students per computer) and carry out simulated astronomical observations of various exciting stars and galaxies.

Homework.

Although they are 2 credit courses, all of the Integrative Studies science labs require 3 hours per week, two hours in the lab and one hour of organized study in another form. In ISP205L the third hour is a 1 hour homework assignment each week. The homework during the first 2/3 of the course consists of "Skygazer Activities" from the *second half* of the Astronomy Media Workbook (see its table of contents). These activities require you to use the *Voyager Skygazer* software (see required materials, above).

For the last few weeks, the homework will consist of preparing for the exercise in the computer lab the following week. There will be questions to answer and turn in.

All homework assignments will be filled out on the web using Angel, and will be due no later than 1 hour before the lab meeting *of your section* in the following week. Angel does not accept late submissions. To log into the ISP205L pages on Angel, go to www.angel.msu.edu. Further instructions will be given in class.

If you have difficulty with the homework, go to or phone any TA during their office hour, or contact our email help desk during its hours of operation. We have a computer set up in the TA's office on which you can do the homework if you wish.

Grading.

There will be two Sky Quizzes during the semester, each lasting about 30-40 minutes. The lecturer will turn down the lights in the Planetarium and point out bright stars or constellations then will briefly turn up the lights so that you can write down their names on your answer sheet. You will have been taught this material during the weekly sessions in the Planetarium.

Each lab session except for the ones in which the Sky Quizzes occur will end with you writing up a brief summary of what the main points were and what you have learned. These will be due before you leave the lab session, and will count as 25% of your grade.

Due to a shortage of TA-power, we will only grade about 1/3 of the questions on your homework assignments, randomly chosen from the full set of questions. However, if the other 2/3 of your answers are all blank, we will knock off some extra points. So answer all of the questions. The graded answer sheets will then be made available to you on Angel, about a week after you turn them in. In addition, most of the Planetarium sessions will start with a short review of some of the more

interesting or difficult concepts from the homework, with you providing answers using your clicker. Be prepared.

The relative weighting of different parts of the course will be as follows:

- Homework: 25%
- Discussion during lab (using clickers) and accuracy of results when you report on measurements: 25%
- Write-ups done during lab: 25%
- Sky Quizzes: 25%

There is no final exam.

Our aims are to be fair, and to let you know during the semester how you are doing so that you will have fair warning if you need to put on a late-semester sprint to get a decent grade. Each section will be graded on a curve, and the average grade will be set to approximately 3.2, which is a typical average for the other ISP lab courses. Your weekly scores will be posted on Angel as soon as we have completed the grading, so you can follow them there. But it will usually take at least one week after you have turned them in for us to grade the assignments, so be patient. We will post provisional curves for each section at the same time that we post the results of each of the Sky Quizzes, so that you can see how you are doing relative to the rest of the class.

Missed Assignments/Labs.

We know that emergencies arise during the semester, and that some of you may occasionally need to miss a lab meeting. For this reason we will automatically drop the lowest two lab grades. This will cover you for anything from hospital stays to family deaths to just goofing off, but we will *only* drop the lowest two, so don't waste them by goofing off.

However, this policy *excludes* the two "Sky Quizzes". If you absolutely have to miss a Sky Quiz, you should contact your section's lead TA and see if it is possible to arrange for a makeup. Do this *before* the Sky Quiz if you know you will have to miss it for some valid reason. Goofing off is *not* a valid reason.

We will also drop the lowest two homework assignments, because we are really cool.