

ISP205L
Visions of the Universe Laboratory
Spring 2006 Syllabus

www.pa.msu.edu/courses/ISP205L

Course Goals.

Our major goal is to improve your understanding of how science actually works. This is an important topic because our modern society is based on technology that grew out of scientific understanding, and decisions made by non-scientists about how to apply scientific results have a huge effect on all of us. Many of the important early steps in the development of science emerged from the study of the night sky. We want to help you see how that occurred by retracing some of those steps. The general flow of events has been to notice patterns in nature, to carefully observe those patterns, and to continuously use that information to develop progressively more accurate descriptions of nature which allow us to make ever more useful predictions. We hope that this course will help you to improve your ability to recognize a correct and useful scientific explanation when you see it, and will then encourage you to critically apply that understanding to future problems.

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)	Lead TA, Section 3 (Wednesday)
Charles Kuehn (kuehncha@msu.edu)	Lead TA, Section 4 (Thursday)
Thang Hun Le (lethang@msu.edu)	Help Desk
Aparajita Sengupta (sengupta@pa.msu.edu)	Lead TA, Section 5 (Friday)
Matt Steele (steele24@msu.edu)	Lead TA, Section 1 (Monday)
Angelo Varlotta (varlotta@pa.msu.edu)	Lead TA, Section 2 (Tuesday)

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 go to only 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. You need a *NEW* copy, so that it will have unused “Results Sheets” at the end of each SkyGazer Activity. You will do your homework on these Results Sheets.

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 taking the lecture course, be aware that only about half of the students who are in the lecture course are also taking the lab, so you might be able to borrow or cheaply buy the SkyGazer CD from somebody who is NOT taking the lab (they will have no other use for the CD). Another route that some students have used to get the CD cheaply is to look on the web for a used textbook that is stated to have the CD still with it. Either version 3.4 or 3.6 of SkyGazer (and probably also even earlier versions) will let you do the homework, but only version 3.6 supports the MAC OS-X operating system. You also can buy the software directly from its manufacturer: Carina Software, www.carinasoft.com, phone (925) 838-0695 or (800) 493-8555. Their website talks only about a MAC version, but the same CD carries a Windows version. The price stated on the web is \$79.95 + shipping and handling, but you can get it for \$50 + \$8 shipping by phoning the company (they are on Pacific Standard Time) and telling them that you are taking this course at MSU.
- As a last-ditch possibility, we have a small number of CDs that we loan out for 24 hours at a time. But we cannot guarantee to have enough to cover everybody, so you should try hard to come up with your own copy.

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 13 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.

Angel Site and Course Web Site

Your grades, and some assignments, will appear on Angel, at www.angel.msu.edu, as the course SS06-ISP-205L Visions of the Universe Lab. The general course website is at www.pa.msu.edu/courses/ISP205L, or you can get to this same page by clicking the “COURSE WEB SITE” tab on Angel. The syllabus, course schedules, office hour information, etc. will be found on this web site.

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 will be back in the Planetarium. It is anticipated that the full time period will be needed for almost all sessions.

Attend the section in which you are enrolled.

You should only go to a different section in cases where you have obtained advance permission from your lead TA or from Professor Baldwin.

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.
- Most clicker questions carry partial credit for a wrong answer, so you get points just for participating.
- If you do not have your clicker, you may submit answers on paper. However, except for weeks 1 and 2 of the class, such submissions will only get an amount of credit as if all questions had been answered *incorrectly*. This is the penalty for not having a working clicker.

Computer Lab Sessions.

Three of the lab sections will be held in some of the general micro-labs that are spotted around campus. On those days you should go directly to Bessey Hall, Room 216. In each case, your section will be split between Bessey 216 and another nearby room, each under the guidance of its own TA. 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, of which 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). The course web site contains a 3-page document "Supplementary Instructions for SkyGazer Homework Assignments". When doing the homework, read these supplementary instructions along with the instructions in the astronomy Media Workbook... otherwise you will not get the correct answers.

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.

For the first several weeks, homework assignments will be filled out on the "Answer Sheets" that are found after each SkyGazer activity in the Astronomy Media Workbook. These will be due at the *beginning* of class. On some occasions later in the semester you will need to submit homework using Angel (www.angel.msu.edu). Complete instructions will be given at that time.

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 in the TA's office on which you can do the homework if you wish.

Grading.

There will be Sky Quizzes during weeks 5 and 10, 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.

In weeks 5, 10 and 15 there will also be Clicker Quizzes, answered using your clicker, which will cover the course material that is not on the Sky Quiz.

Each lab session except for the first one and the ones in which the 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 assignments will then be returned to you in about two weeks. 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), the three clicker quizzes, 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 or more weeks for us to grade the assignments after you have turned them in, so be patient. We will post provisional curves for each section at the same time that we post the results of Quizzes 1 and 2, so that you can see how you are doing relative to the rest of the class.

Missed Assignments/Labs.

Attend the section in which you are enrolled. You should only go to a different section in special cases where you have obtained advance permission from your lead TA or from Professor Baldwin. If you wish to observe a religious holiday that occurs on the day of your regular lab section, you must give at least one week of advance notice to either your Lead TA or to Professor Baldwin, so that we can arrange for you to attend a different section.

We know that emergencies arise during the semester, and that some of you may occasionally need to miss a lab meeting due to unforeseen circumstances. 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 and the three clicker quizzes. If you absolutely have to miss a quiz, you should contact your section's Lead TA and see if it is possible to arrange for a makeup. Do this *before* the 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.