

SYLLABUS

VISIONS OF THE UNIVERSE

ISP 205, SECTIONS 1 & 3, SPRING 2011

The Integrative Studies courses are intended to illustrate and explore the methods, results, and limitations of scientific inquiry. ISP 205 uses astronomy as the science example. It takes non-science majors through an outline of what we do (and don't) know about the universe on size scales from planets on up, and of what sorts of thinking has led us to these concepts. Major topics will include the scientific method, the laws of physics (and what happens when you break them), the solar system, a bit about how stars work, galaxies, and cosmology (the overall structure and evolution of the universe). Simple algebraic equations will be used.

Instructor: Professor Jack Baldwin, Room 3270 Biomedical Physical Sciences Bldg. (BPS),
Phone (517) 884-5611 (baldwin@pa.msu.edu)
Office hours: Monday 12:45–2:00; Tuesday 3:00–4:00; or by appointment.

Text: “*THE ESSENTIAL COSMIC PERSPECTIVE*” by Bennett, Donahue, Schneider & Voit. Either the 4th or 5th edition is fine.

Angel: Course announcements, a copy of this syllabus, your grades, and copies of the applets and movies shown in class can be accessed through the Angel page for this course, at www.angel.msu.edu. The Angel page will include a link to the course web site (www.pa.msu.edu/courses/isp205/sec-1) which will contain some of the information.

Midterms: 3 Midterms, each for the full class period, on Feb. 2 (20% of grade), Mar. 2 (24% of grade) and April 6 (24% of grade).

Final exam: The final exam will count for 32% of your grade. It will be held at the assigned place and time for this course: 10-12 AM Friday, May 6 (**WARNING:** the time for this exam is given in the **COMMON FINAL EXAM SCHEDULE**, which appears at the *bottom* of the MSU final-exams web page). The location will be announced later in the semester. About 2/3 of the questions will be from the material covered after the third midterm, but the other 1/3 will revisit the earlier parts of the course.

The following grade scale is guaranteed: 0.0 - 0.0% to 47.5%, 1.0 - 47.5% to 55.0%, 1.5 - 55.0% to 62.0%, 2.0 - 62.0% to 68.0%, 2.5 - 68.0% to 76.0%, 3.0 - 76.0% to 83.0%, 3.5 - 83.0% to 90.0%, 4.0 - 90.0% and above. The actual scale may be curved downwards from these values, but the score needed for a particular grade will not be raised. For example, you are guaranteed to get a 4.0 if your score is above 90%, no matter what.

In-class extra credit questions: I will occasionally ask multiple-choice questions during class, which will count as extra credit. To answer these, you will need an “i>Clicker” brand clicker. You should use only your own clicker, and nobody else should use your clicker for you. Each question answered will result in a small amount of extra credit so that the total amount of extra credit if all are completed is 3%. A correct answer will receive full credit for the question, and any response will count as 2/3. But to get any points, you must register your clicker ID number, *EITHER* by clicking on your name as it scrolls by on the screen at the front of the room at the start of each class during the first week; *OR:* go to the course Angel page, “Lessons” tab, click on “Register your clicker here”, follow the instructions given there to find and type in your clicker number.

Homework. There is no required homework. But to help you see how well you are following the material, short sets of questions will be posted each week with answer sheets posted a week later.

Academic Integrity: *Exams:* closed-book, closed-notes, no cell-phones, calculators or other electronic devices permitted, no talking, eyes on your own work only. Bring photo-ID to all exams. *In-class Extra-credit Questions:* You are encouraged to talk with your neighbors about the answers, but nobody else is permitted to click in an answer for you. Nor you for anybody else. *Failure to meet these standards:* Grade 0.0 for assignment/exam in question, or possibly for entire course depending on the severity of the case.

APPROXIMATE COURSE SCHEDULE

VISIONS OF THE UNIVERSE

ISP 205, SECTIONS 1 & 3, SPRING 2011

This schedule is subject to change. *THIS VERSION: REVISED Feb 5, 2011*

Chapter numbers from the text are indicated in square brackets.... [8] means the material is covered in chapter 8 of the textbook, [2.4] means it is covered in section 2.4, etc. The midterms and final will be on the material actually covered in the lectures. The references to the textbook are only suggestions for reading to supplement the lectures.

Jan 10,12,14. The size of the Universe. [1] The laws of motion: Epicycles [2.4]; Ptolemy, Copernicus, Kepler [3.1 → 3.3]. The scientific method, “laws” in physics [3.4].

Jan 17. Martin Luther King Day. No class.

Jan 19, 21. The laws of motion: Newton [4].

Jan 24, 26, 28. Radiation and spectra [5].

Jan 31. Telescopes [5]

Class cancelled Feb. 2, so MIDTERM 1 was on Feb 4 (20% of grade)

Feb 7, 9, 11. The solar system. The formation of the Solar System [6.1→6.4], Earth as a planet, The Moon [7]

Feb. 14, 16, 18 Mercury, Venus, Mars [7]. The giant planets (Jupiter, Saturn, Uranus, Neptune).[8]

Feb 21, 23, 25. Moons and rings [8] , Asteroids [9.1], Comets [9.2]

Feb 28. Pluto [9.3]

WEDNESDAY Mar 2. MIDTERM 2 (24% of grade)

Mar 4. Cosmic Collisions [9.4]

Mar 7–11. Spring Break

Mar 14, 16. Planets around other stars [6.5]. Search for life elsewhere [bits of 18].

Mar 18, 21. The Sun [10].

Mar 23, 25. Analyzing starlight, the types of stars [11]. The evolution of stars [12].

Mar 28, 30, Apr 1. The death of stars. General Relativity and Black Holes. [13]

Apr 4. Black holes [13]

WEDNESDAY Apr 6. MIDTERM 3 (24% of grade)

Apr 8, 11. Our Galaxy (the Milky Way) [14]. Other galaxies [15.1]

Apr 13, 15. The expanding universe. [15.2] Evolution of galaxies, quasars [15.3, 15.4].

Apr 18, 20, 22. Cosmic Structure, Dark Matter and Dark Energy [16]. The Big Bang [17.1].

Apr 25,27. The Cosmic Microwave Background. Inflation [17.2, 17.3]. The future of the Universe.

April 29. Review.

FRIDAY May 6, 10-12AM. FINAL EXAM (see “Common Final Exam Schedule”)
(32% of grade) Location TBA.