Core Curriculum

CC105 Natural Sciences

The Evolution of the Physical Universe and of the Earth

Course Syllabus

Fall 2005

OVERVIEW

CC 105 is the first-semester natural science course of the Core Curriculum, concentrating on the physical sciences. (Note: You should also be enrolled in the concurrent Core humanities course CC 101.) The Core Curriculum is a general education program that provides an overview of human knowledge and achievements in the humanities, natural sciences, and social sciences. Through the study of these subjects, students develop academic skills that will be of great use in the remainder of their formal education as well as in their lives beyond academia. In CC 105, we will explore the physical sciences (astronomy, physics, chemistry, and geology). Our main theme is the evolution of physical matter within the universe, “the story of stuff.” Perhaps the greatest contribution that CC 105 will make to your life, however, will be less practical but no less important: You will gain a sense of how you personally, and humanity in general, fit into the universe.

The Core Curriculum explores fundamental intellectual issues from the points of view of the humanities, natural sciences, and social sciences. To promote this integration among disciplines, throughout CC 105 we will discuss the historical, philosophical, and theological implications of the scientific description of the universe.

There are three main components to the course: the lectures, the discussions, and the laboratory exercises. You must attend all three components throughout the semester. The lectures are held twice per week, Tuesdays and Thursdays 2:00-3:30 in the Tsai Performance Center, 685 Commonwealth Ave. The discussion sections meet for one hour each week in room CAS B6A, 725 Commonwealth Ave. The regularly scheduled labs meet biweekly according to the attached laboratory information sheet in SCI B03, Science Center, 590 - 596 Commonwealth Avenue.

In addition, there are two special events:

- A reenactment of Galileo's apocryphal experiment at the Leaning Tower of Pisa on Sunday, September 11, 2:00 pm, CAS parking lot (behind Tsai Auditorium). Attendance is mandatory and will be recorded.

- A planetarium show at the Boston Museum of Science on either Tuesday November 15 or Wednesday November 16, from 6:00 to 8:00 pm. Attendance is mandatory and will be recorded.

On Fridays there will be optional problem solving sessions for those who need extra help with math and the homework assignments. These will meet on the hour in MET B2B (MET Bldg, 755 Comm Ave) from 10:00 to 12:00, and FLR 122 (Fuller Building; 808 Commonwealth Ave) from 12:00 to 4:00. These tutorials are not required, but may be helpful for students who need to strengthen their problem solving skills. Schedule of tutorial hours

The CC 105 course coordinator is Professor James Jackson. He, Professors Bansil, Brainerd, Marscher, and Whitaker, and Drs. Gutlemer, Hudon, and Zimmer will lead the discussion sections. All the professors will give lectures (see attached lecture schedule). The lab instructors will be Drs. Gutlemer and Hudon.

In order to facilitate integration of the humanities with the natural sciences, the lecture series includes three "integrating forums" in which professors in philosophy, theology, and natural science will participate. Each forum will leave ample time for discussion among both the faculty and the students.
The Lecture + Examination Schedule and the Laboratory Schedule are posted separately on this website. These schedules are subject to change, in which case announcements will be made in class.

LOGISTICS

1. Professors (Lectures & Discussions)

James Jackson (Astronomy), CC 105 Course Coordinator; room CAS 605, 353-6499, e-mail (preferred): jackson@bu.edu; office hours: M 9-11 (To get to the 6th floor, go to the west side of the CAS building, take an elevator to the 5th floor, then take the stairs next to room 520 to the 6th floor)

Rama Bansil (Physics), room SCI 216, 353-2969, rb@bu.edu; office hours: M 1:30-2:30, T 12-1.

Tereasa Brainerd (Astronomy), room CAS 514, 353-6646, e-mail: brainerd@bu.edu; office hours: T 11:30-12:30, W 3-4.

Alan Marscher (Astronomy), room CAS 418, 353-5029, e-mail: marscher@bu.edu (e-mail preferred, read often but not always on weekends or at night); office hours: M 9:45-10:45, F 2-3.

Scott Whitaker (Physics, also Associate Dean), room CAS 115, 353-2690, e-mail: scott@bu.edu; office hours: Th 10-11, F 10-11.

2. Instructors (Labs and Discussions)

Johanna Gutlerner, Core Office (Room CAS 119), 358-2890, e-mail: jogut@bu.edu; office hours: M 10-12

Daniel Hudon, Core Office (Room CAS 119), 358-2890, e-mail: hudon@bu.edu; office hours: W 11-1

Mindy Zimmer, (Earth Sciences), room CAS B56, 353-4075, email: mzimmer@bu.edu; office hours: T 12:30-1:30, Th 12:30-1:30

3. Core Curriculum Office: Prof. David Eckel, Acting Director, (e-mail: mdeckel@bu.edu); Zachary Bos (e-mail: zakhos@bu.edu), Senior Secretary; room CAS 119, 353-5404

4. Where to get help: For help with the course material, you should go to office hours. You may see any of the instructors (not just your discussion leader) during their office hours. For administrative assistance, please see either Mr. Bos in the Core Office for routine matters or Professor Jackson or Eckel for stickier problems. If you need to see one of the professors or instructors at any time other than during their office hours, simply e-mail or call them to set up an appointment. For help with math or homework, you should go to one of the Friday tutorial sessions.

5. Books and Laboratory Manual: You need to purchase the CC 105 textbook Physical Science 6th Edition (by Tillery). It is available at the bookstore, Barnes & Noble @ Boston University (Kenmore Square). In addition, you might find helpful the optional book, A Brief History of Time by Stephen Hawking. It is a popular book that is available at most bookstores and Internet companies that sell books. The laboratory manual will be handed out in lecture and posted on-line.

6. Exams and Quizzes: There will be two in-class midterm exams (check the lecture schedule on the last page for the dates) plus a cumulative final exam, which will be given on Friday, December 16 from 9:00 to 11:00 A.M. in the lecture room (Tsai). This date is set by the University and cannot be changed for individual students. There will be quizzes in discussion sections (no quizzes on the first week, however), based on material that you were assigned to read (mostly from the textbook) as well as on material that was covered at your previous or current discussion meeting.

http://www.bu.edu/core/cc105/syllabus.html

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7. **Grading:** Your final numerical grade will give the following weight to each of these components of the course: midterm exams 30% (15% each), final exam 30%, discussion section 25% (1/2 for weekly quizzes, and 1/2 for homework assignments; outstanding class participation can raise your discussion grade, while absences or lack of class participation will lower it), laboratory exercises 15%. The labs are worth 15% of your grade and there are 5 labs, so each lab is worth 3% of your grade. **Since the course carries CAS laboratory science credit, missing (which includes handing in but showing very little effort leading to a grade of less than 50% of full credit) two or more lab exercises will result in an "F" grade for the entire course!** In other words, **if you fail the lab, you fail the course!** The course will be graded on a curve, with an average grade in the B-range. [In past years, this has caused the division between a B- and C+ to be at a final average grade of about 80 out of 100.] The lowest two quiz grades (including those missed because of absences) and the lowest single homework grade will be dropped before computing your average grade.

8. **Late Assignments:** Homework assignments are due at the beginning of the discussion section. Lab assignments are due on the dates posted in the lab section of this syllabus. Since awarding credit to late work would be unfair to the students who hand their work in on time, we do not accept late work. This policy can be overridden if you arrange the delayed submission in advance with Prof. Jackson for lab exercises, and your discussion instructor for other work.

9. **Absences:** You are expected to attend two lecture sections per week, one discussion section per week, one lab section every two weeks, the gravity demonstration on September 11, one planetarium show on either November 15 or 16, and the final exam. Attendance will be taken. Because we care about each of you, you will be missed if absent!! Also, since some of your grade will depend on your performance on quizzes and (if it is outstanding or poor) class participation in your discussion section, unexcused absences will affect your grade! In addition, for CAS students the Dean’s Office will be notified if you miss several classes without a valid excuse. Except in cases of personal illness or extraordinary personal problems (we require a note from Health Services or a doctor or other documentation if you miss coursework for these reasons), you are expected to attend all lectures, discussions, and labs. If you are or have been ill, etc., you should contact your discussion leader or Prof. Jackson as soon as possible — preferably before — you miss a class. **You must make up all work missed because of an excused absence.**

10. **The CC 105 Web Page,** URL http://www.bu.edu/core/cc105: On the web page, you will find a number of useful items, including the outlines and most of the graphics shown in the lectures, as well as some links to other informative sites of relevance to the course. The CAS PC Lab, in room CAS 330, has been reserved for CC 105 students at two time slots each week: MW 9-11 and 2-4. This should be useful if you do not have your own PC or if your Internet connection is slow.

11. **Academic Conduct:** You need to read the CAS *Academic Conduct Code*, which you can pick up in room CAS B3. Academic misconduct involves not only direct cheating on tests, but some more subtle acts as well. **All work handed in for credit must be your own,** with the exception that you may quote or paraphrase from other sources if you also cite the reference and page number. (It is not permissible, however, to use another student's work even if you cite that work.) For assigned homework and lab write-ups, take care not to work so closely with a classmate that some of your results or answers to questions are nearly identical. I.e., your consultations with classmates should be limited to general discussions, not specific items such as "Show me how you answered question 2." **A good general rule is never to look at another student's written work and never to allow another student to look at yours.** If you need help, consult with one of the professors or lab instructors; if they are unavailable, send your question via e-mail. If you do not receive a response in time to complete the assignment by the due date, state so in another e-mail to them (with a copy to Prof. Jackson). **We are required to report cases of suspected academic misconduct to the Dean's Office.** Penalties for violations of the Academic Conduct Code may include suspension or expulsion from the University.

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