SYLLABUS

A. OVERVIEW

CC 104 is the second semester science course of the integrated Core Curriculum, concentrating on the physical sciences and mathematics. The Core Curriculum is a general education program intended to provide an overview of human knowledge and achievements in the humanities, natural sciences and mathematics, and social sciences. Through the study of these subject areas, 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 104, the logic and methods of science will be presented within the overall context of the historical development of the universe as well as of the path by which humans arrived at the present scientific description of that universe.

Probably the greatest contribution of CC 104 to your life, however, will be less practical: you will gain a sense of how you personally, and humanity in general, fit into the universe. The current view on the origin of the universe and how it eventually created humans will be presented, along with the evidence that supports it. The nature of reality and the interaction between the observer and nature will be discussed in the course, as will the steps that led to our current understanding as well as confusion. Profound revolutions in our thoughts on what nature is like have occurred this century, led by Einstein, Bohr, Heisenberg, de Broglie, and Schrödinger. You will see that science is not merely a set of facts to be discovered, digested, and then memorized by succeeding generations of students. Rather, science is very much a human enterprise, our way of understanding nature. No scientific theory is really “correct,” but merely provides a description of nature in a way that humans can comprehend.

Perhaps the most disturbing thing that you will discover is that study of the sub-microscopic world reveals that it is very different in behavior from the macroscopic world. Time does not seem to have the same meaning, and nothing is “real” until it is observed. How this relates to the macroscopic world that we live in, in which humans have a sense of self — a consciousness — and can contemplate what the universe is all about, is rather unclear at the present, and has been argued about by philosophers for many centuries.

One of the main features of the Integrated Core Curriculum is the emphasis on the commonalities between the humanities, natural sciences/mathematics, and social sciences. The historical advancements of science have been directly related to the development of other modes of human thought. The evolution of civilization from ancient to modern times has been affected greatly by scientific and technological discoveries. Throughout CC 104, we will discuss the history behind many of the scientific discoveries. We will also discuss the philosophical and cultural influences that have molded the ways humans have viewed nature through the centuries.

The CC 104 course coordinator will be Professor Alan Marscher of the Department of Astronomy. He will teach 11 of the 26 lectures and one of the discussion sections. Professor Jackson, also of the Department of Astronomy, will teach six of the lectures and two of the discussion sections. Professor Scott Mohr of the Department of Chemistry will give five lectures and lead three discussion sections. In addition, we will be joined by some of the Core humanities professors in three special integrating forums (with ample class participation) that will relate the scientific view with philosophy and religion. Finally, Professor Bania of the Department of Astronomy will deliver a lecture in which he speculates on the possible destiny of our technological civilization.

There are three main components to the course: the lectures, the laboratories, and the discussions. The lectures will be held twice per week, TR 3:30-5:00 in room CLA 522 (725
forums. The final purchase you need to make is a special issue of the magazine *Scientific American* on “Life in the Universe” (October 1994 issue). This contains readings that will supplement the lectures and will be reviewed in the discussion sections.

Running copies of the instructors’ lecture notes plus viewgraphs will be kept in the Core Curriculum Office (CLA 109). Professors Marscher and Mohr will also each have a set. These may be borrowed for photocopying.

6. *Tests and Grading:* There will be two midterm exams plus a final exam. The final exam, to be given on Thursday May 11, 9-11 A.M. in the lecture room (CLA 522), is cumulative, i.e., it will cover the entire course. This date is firm and cannot be changed for individual students. Each laboratory exercise must be completed and handed in. There will also be readings and weekly assigned work in the discussion sections. Your final numerical grade will give the following weight to each of these components of the course: Midterm exams: 25%, Final Exam: 25%, Discussion (assignments and class participation): 30%, Laboratory exercises: 20%.

7. *Absences:* Because we care about each of you, *you will be missed if absent!!!* Except in cases of personal illness (we require a note from Health Services or a doctor if you miss an exam and may require one if you fail to hand in assignments on the due dates), you are expected to attend all lectures, labs, and discussions when scheduled. Professor Marscher will learn to recognize you through a videotape he will make at the discussion sections, and you will have assigned seats in the lectures. Attendance will therefore be taken by sight. If you are or have been ill or even if you have no excuse, you should contact (in order of preference) your discussion leader, Prof. Marscher, Prof. Mohr, or Ms. Peterson as soon as possible if you miss a class. You must make up all work missed. Also, since some of your grade will depend on class participation in discussion sections, unexcused absences will affect your grade! In addition, the Assistant Dean of CLA will be notified if you miss more than three classes without a valid excuse. The positive side of this is that the professors are committed to recognizing you, so you will not merely be a lost face in the crowd.

8. *The Lectures on Videotape:* We will be videotaping all lectures. Hence, in case of illness or a lapse in note-taking, you may review any of the lectures of the course. The tapes will be filed by the Geddes Language Lab, on the fifth floor in the middle section of the CLA/SMG/Stone building. **Important: the fifth floors of the different sections do not connect!** For example, to reach the Language Lab from CLA room 522, you must walk down to the 4th floor, over to the middle of the building, and back up to the 5th floor. The Language Lab has facilities for viewing the videotapes. A copy of the notes and viewgraphs from each lecture will accompany the videotapes. Except in cases of illness, these video tapes should not be used as a substitute for attending the lectures! The Lab strongly suggests that you make reservations to use the tape players; these reservations must be made in person.

9. *Academic Conduct:* You should read the sections of the Student Handbook on academic conduct. Misconduct involves not only direct cheating on tests, but some more subtle acts. 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. For assigned homework and lab write-ups, take care not to work so closely with a classmate that your results or answers to questions are nearly identical. If you need help, consult with one of the professors or a TF. We are required to report suspected cases of academic misconduct to the Dean’s Office. If found guilty of academic misconduct, penalties include suspension or expulsion from the university.

10. *Comments Are Welcome:* We welcome any and all comments on what we are doing right and suggested improvements. Address comments to Professor Marscher, Professor Mohr, your discussion leader, the TFs, or Dean Jorgensen.