PHIL 4400/6400: *History of Natural Science*

3:30-4:45 PM, TTH, Peabody Hall 205S
O. Bradley Bassler, Department of Philosophy
Office: Peabody Hall 1B, 542-2825

In this course, we will study the problem of revolutions in the historical development of science, focusing on the account given by the prominent historian of science, Thomas Kuhn. We will take the transition from late 19th century science, and in particular electromagnetism, to early 20th century science, and in particular quantum theory, as a focal case to study.

This course will involve both philosophy and science: to think about the history of science, you need some science to work on. This course will be challenging: at at some point everyone in the class should be really challenged. If you have concerns about your mathematics or physics or philosophy background, let's talk. Overall, the course should be quite demanding and you need to make sure you're really committed to the work before you sign on. However, I want the course to be available to anyone who is willing to work hard on it, so all tools will be developed "from scratch."

The requirements for the course are:

(1) Regular attendance and class participation. Students missing more than four classes for any reason will be withdrawn at the discretion of the instructor. Chronic lateness will be counted as absence from class. All decisions of the instructor in this regard will be final and binding.

(2) Evaluated assignments. There will be 3 evaluated assignments for this class: a paper on Kuhn's *Structure of Scientific Revolutions* (30%, 4400 4-6 pages, 6400 6-8 pages), a paper on Simpson's treatment of Maxwell's electromagnetic theory (30%, 4400 4-6 pages, 6400 6-8 pages), and a final paper on Kuhn's book on quantum theory (40% 4400 6-8 pages, 6400 8-10 pages). Attendance and class participation will be used to resolve borderline grades.

This syllabus is a guide and subject to revision.

Texts:

Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago, 1996).
Thomas K. Simpson, *Maxwell on the Electromagnetic Field: A Guided Study* (Rutgers, 1997).
Thomas Kuhn, *Black-Body Theory and the Quantum Discontinuity, 1894-1912* (Chicago, 1987).

August

18 Introduction
20 SSR, Preface and Chapters 1-4

25 SSR, Chapters 5-6

27 SSR, Chapter 7-8

1 SSR, Chapters 9-10
3 SSR, Chapters 11-12
FIRST PAPER ASSIGNMENT

8 SSR, Chapter 13 and Postscript
10 MEF, Chapter 1

15 MEF, Chapter 2
FIRST PAPER DUE
17 MEF, Chapter 2 (cont.)

22 MEF, Chapter 2 (cont.)
24 MEF, Chapter 2 (concl.)

29 MEF, Chapter 3

October

1 MEF, Chapter 3 (cont.)

6 MEF, Chapter 3 (cont.)
8 MEF, Chapter 3 (concl.)

13 MEF, Chapter 4
15 MEF, Chapter 4 (cont.)
SECOND PAPER ASSIGNMENT

20 MEF, Chapter 4 (cont.)
22 MEF, Chapter 4 (concl.)

27 BBT, Chapter 1
SECOND PAPER DUE
29 BBT, Chapter 2

November

3 BBT, Chapter 3
5 BBT, Chapter 4

10 BBT, Chapter 5
12 BBT, Chapter 6

17 BBT, Chapter 7
19 BBT, Chapter 8

FINAL PAPER SUGGESTED TOPICS

THANKSGIVING HOLIDAY

December

1 BBT, Chapter 9
3 BBT, Chapter 10

Final paper due on December 10 by noon in Philosophy Department office.