University Studies 210: The Logic of Science
Tennessee Governor's School for the Sciences
The University of Tennessee, Knoxville
Summer 2007
MWF 8:30 – 9:30 a.m., BU 555

Contact Information:

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Teaching Assistants:
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Dr. Walter Riker:
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Texts: *Choice & Chance*, (4th edition) by Brian Skyrms
The Elements of Style, by Strunk and White.

Course Description and Course Objectives: The course provides the foundation for scientific reasoning by establishing the core logical tools for scientific logic. These tools involve an introduction to formal logic proper and the difference between formal logic and scientific induction. The tools of scientific induction will include an analysis of the traditional problem of induction, the inductive justification of induction, the probability calculus, Bayes's theorem, the kinds of probability, and the application of scientific inductive logic to the core sciences. Some specific goals include, but are not limited to:

- Learn the difference between deduction and induction;
- Learn statistical, probability, and causal models of scientific reasoning;
- Acquiring the ability to ***reconstruct*** and ***evaluate*** scientific reasoning;
- Learn how to make political and personal decisions give certain scientific claims; and
- Learn how, in writing, to communicate more effectively the results of such critical analysis.

Assignments: Reading and homework assignments will be issued during each class meeting according to the syllabus. Students are ***strongly*** encouraged to do the readings and homework before the following lecture. This practice will reinforce basic material while providing students the opportunity to formulate pertinent questions about difficult material for the next lecture. All assignments must be typed if they are to be turned in for a grade unless otherwise stated.

Grading: Assignments will count toward the final grade in the following manner:

Writing Assignments (there will be at least 2):	25%
Group Web Project:	25%
Final Exam:	30%
Participation and Problem sets:	20%

Final grades will be assessed on the following percentage scale:

A = 91-100%	B+ = 86-90%	C+ = 76-80%	D = 60-69%	F = 0-59%
	B = 81-85%	C = 70-75%		

Writing and Computer Skills: You will be involved in writing and computer skills classes. The writing and computer labs are for your benefit, so use them. Your final group project will encompass both writing and web components. So, make sure you attend these labs. Plus, the final exam will have writing and computer questions included. So make sure to read *The Elements of Style*.

Discussion Sections and Papers: On Wednesdays you will have papers due, and you will have discussion sections with either Leigh Shoemaker or Kevin Bond. You should go to the same discussion section every time. Part of your participation grade will reflect how you did in the discussion groups.

Attendance: Attendance is mandatory, and you should be on time. I know that this is (i) an early class, and (ii) you have to walk from Hume's Hall to get here, but you can all do it. Sleep will be your best friend at GSS, so don't neglect it.

Late Policy: Stuff cannot be turned in late unless there is a relevant explanation for the allowance (sickness or religious holiday, etc.) It is best if you let me know before the assignment is due if you have a reason to turn it in late.

E-mail & Blackboard: There will be a blackboard component to this class. I will place announcements, homework assignments, and quizzes on blackboard on a weekly basis and you may have to use the digital drop box feature. I will place course related material on blackboard in PDF format. Thus, you will have to know how to open Adobe PDF files. You can get Adobe Reader for free at the Adobe website. All e-mail correspondences will be done through your UT e-mail account. So, if you have another e-mail account you would like to use, forward your UT e-mail to that account. If you need help doing this, go to: http://online.utk.edu.

Honor Statement: Students must uphold the Academic Honor Statement they signed when they arrived at The University of Tennessee. If you do not remember the Honor Statement, it can be found on page 36 of the *Undergraduate Catalog*. I reserve the right to use plagiarism detection software like 'Turnitin.com' to enforce academic honesty.

Students with Disabilities: Reasonable accommodations will be made for students with disability. Such students must (1) register with, and provide documentation to, the Office of Disability Services (ODS), and (2) submit a letter from ODS stating that such academic accommodations are needed. All relevant documentation should be submitted within the first few days of classes or as soon as a disability is identified. See me if you have questions.

Odds & Ends: Please turn off your cellular phone, pager, PDA, or any other item that may beep or cause a disturbance in class. If you are having trouble with your electronic devices, then leave them at home or ask for help. If your device beeps or rings during class, you will have to ask the class for help. You do not want to have to ask the class for help!

Class Schedule

Monday, 11 June 2006: **Syllabus & Intro to Class**

Wednesday, 13 June 2006: **Simple Statement and Deductive Validity**

Friday, 15 June 2006: **Conditionals (The Workhorse of Logic)**

Monday, 18 June 2006: **More On Conditionals**

*Wednesday, 20 June 2006: **Probability and Inductive Logic (C&C II)**

Friday, 22 June 2006: **Traditional Problem of Induction (C&C III)**

Monday, 25 June 2006: **More on the Problem of Induction**

*Wednesday, 27 June 2006: **Goodman Paradox (C&C IV)**

Friday, 29 June 2006: **Causation and Mill's Method (C&C V)**

*Monday, 3 July 2006: **Probabilities (C&C VI)**

Wednesday, 4 July 2006: **Independence Day**

Friday, 5 July 2006: **The Probability Calculus – Bayes' Theorem**

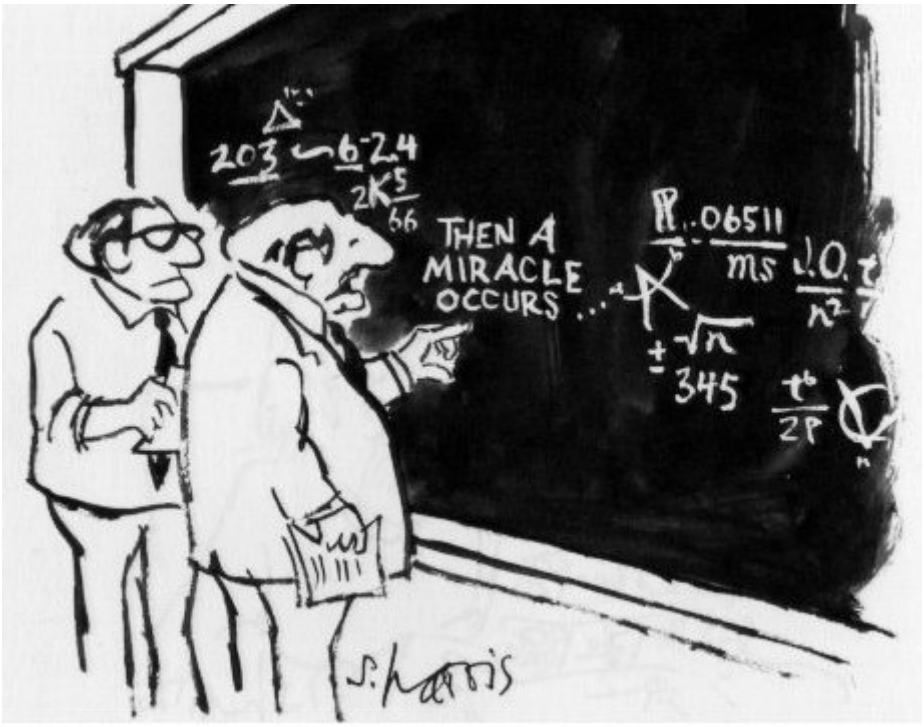
Monday, 9 July 2006: **Kinds of Probabilities (C&C VII)**

*Wednesday, 11 July 2006: **Probabilities and Scientific Inductive Logic**

Friday, 13 July 2006: FINAL EXAM @ 10:30 a.m.

* Indicates a day you have discussion sections.

The above schedule and procedures in this course are subject to change in the event of extenuating circumstances.



"I think you should be more explicit here in step two."

from *What's so Funny about Science?* by Sidney Harris (1977)

"You both have something in common. Dr. Davis has discovered a particle which nobody has seen, and Prof. Higbe has discovered a galaxy which nobody has seen."