

**FIRST YEAR SEMINAR 100**  
**SKEPTICISM, PSEUDOSCIENCE, AND THE SCIENTIFIC METHOD**  
**Tuesday and Thursday, 3:45-5:00, Wake Downtown 1505**

<b>Instructor:</b> Eric Carlson	<u>Office Hours</u>
<b>Office:</b> 306 Olin Physical Laboratory	2:00-3:15 Tuesday and Thursday,
<b>Cell Phone:</b> 336-407-6528	or by appointment
<b>e-mail:</b> ecarlson@wfu.edu	Office phone: 336-758-4994
<b>Texts:</b> <i>How to Lie With Statistics</i> by Darrell Huff	
<i>Why People Believe Weird Things</i> by Michael Shermer	
<i>Flim-Flam</i> , by James Randi	

**Description:** This course is a one-semester course designed to improve critical thinking skills. In particular, it is the goal of this course to encourage us to think of all the ways in which we can be fooled by others and fool ourselves. In particular, we want to understand the ways in which scientists attempt (not always successfully) to discern meaningful patterns from phenomena around us, and not be biased by our preconceptions. It is also the goal of this course to encourage you to work on your writing skills.

**Materials:** In addition to the texts, you are expected to buy a calculator with the four basic functions as well as a square root function. (Percentage functions and/or statistical functions may help, but are not necessary. I don't use them myself.) You must also use a word processing program on your computer. Microsoft Word is more than adequate. We will use our laptops for at least one homework assignment.

**Exams:** There will be a midterm, probably around Thursday, March 1, and a final on Saturday, May 5 at 2:00 PM. These tests will be generally short answer and essay tests, with some numerical problems.

**Homework:** There will be weekly homework assignments, usually with a rough draft due on Tuesday, and a final draft due on Thursday. Written homework is expected to be submitted via email in either Microsoft Word or pdf format, and must be submitted by midnight on the day due. Once per semester, a student may request a free homework extension until the next class day by emailing such a request before midnight on the day it is due. Late homework will be penalized 20% per day, unless there is written confirmation of illness or other emergency. If you plan to be out of town on the day homework is due, you must turn it in early. Although most homework will be submitted by groups, all homework must be authored entirely by the submitter themselves (though data tables may be cut and pasted from a friend's homework).

**Presentations:** Some homework will be presentations; some will include both written work and presentations. All students are required to be prepared for presentations on the first day they are given. The homework pass cannot be used to delay presentations (though illness and other delays may be allowed).

**Attendance:** You are expected to attend class regularly. You are allowed one unexcused absence per semester. For all other absences, you must have a written excuse for your absence.

**Class Participation:** You are expected to participate in class discussion, by contributing your own ideas, by asking questions, and by challenging the viewpoints of others in the course. If you never challenge the professor on anything he says, you will flunk the course. This course is partly about deception, both by others and ourselves, and you must learn to never accept any information as truth without careful analysis.

**Book Reports:** You will have to choose and then read a book about skepticism, science, or pseudoscience. The book must contain ideas that are controversial and, to some extent, accessible to all (global warming or astrology are acceptable topics; Newton's laws or string theory are not). Additional information will be given out later in the semester.

**Grading:** The two tables at the right are a not necessarily accurate guess as to what my grading scheme will be. In particular, I reserve the right to grade on a sliding scale.

<u>Grading Breakdown</u>		<u>Grading Scale</u>	
Mid-Term:	15%	94% A	73% C
Final:	25%	90% A-	70% C-
Homework:	30%	87% B+	67% D+
Book Report:	10%	83% B	63% D
<u>Class Participation:</u>	<u>20%</u>	80% B-	60% D-
<b>TOTAL:</b>	<b>100%</b>	77% C+	<60 F

**World-Wide-Web:** Some information for this class can be found on the home page for this course at

<http://users.wfu.edu/ecarlson/skeptic/>

It is probably a good idea for you to check out this page and add it to your bookmarks some time soon.

### TENTATIVE WEEKLY SCHEDULE

<u>Dates</u>	<u>Topics</u>
January 18	Introduction, The Scientific Method
January 23 25	Forming Multiple Hypotheses: Deception and Magicians
Jan/Feb 30 1	Designing an Experiment: Controls, Placebos, Blind, and Double-Blind Experiments
February 6 8	Gathering Data: Memory and Eyewitness Testimony
February 13 15	Case Study: Aliens and Alien Abductions
February 20 22	Case Study: Lights in the Sky
Feb/Mar 27 1	Review, Midterm (Spring Break)
March 13 15	Introduction to Statistics
March 20 22	Case Study: Horoscopes and Biorhythms
March 27 29	More about Statistics
April 3 5	Interpreting the Data: Systematic Errors
April 10 12	Case Study: Ghosts and Near-Death Experiences
April 17 19	Case Study: Homeopathic Remedies
April 24 26	The Media and Pseudoscience
May 1	Ethical Issues in Pseudoscience
May 5, 2:00–5:00	Final Exam