

FYS 175—Science or Pseudoscience?
MWF 11:00 a.m.
Course Description, Fall 2013

Instructor: Andrew Dougherty
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Library Liaison: Terese Heidenwolf heidenwt@lafayette.edu
Writing Associate: Matthew Warrenner warrenem@lafayette.edu

Office Hours:

See attached schedule. Outside of those scheduled times, I will usually be either in my office or lab during the free times indicated on my schedule. Please feel free to call, e-mail, or stop by at any time and ask a question or set up an appointment.

Classes on Snow Days and Other Emergencies:

If I am unable to make it to class, I will send email notification via Moodle and leave a message on my voice mail (610-330-5212).

Description:

Many of today's important issues have a scientific component. From global warming to personal nutrition and health, and everywhere in between, scientific-sounding claims are made to bolster arguments and persuade readers. How can the educated layperson sensibly distinguish genuine science from pseudoscience?

In this course, we will examine what distinguishes science from pseudoscience, and why it matters. We will start with simple examples of science and pseudoscience, and proceed to develop an understanding of the nature of scientific inquiry. You will observe claims, in advertising and the news, investigate them, and report on your findings.

Goals and Student Learning Outcomes:

As a result of this course, I hope that you gain insight and experience in how a scientific approach contributes to a broader understanding of complex topics. We cannot all be experts in every topic, but we can develop an appreciation of what makes good science and what makes bad science, and how we might begin to distinguish them. Specifically, after completing this course, you ought to be able to:

- recognize what distinguishes science from pseudoscience,
- investigate scientific-sounding claims,
- make reasonable judgments about the credibility of various sources, and
- communicate your conclusions in a clear and scholarly manner.

As part of Lafayette's First-Year-Seminar program, this course also strives to meet a number of broader learning objectives. You will learn to:

- Develop strategies for interpretation and evaluation.

- Examine personal assumptions and biases, thereby building informed perspectives.
- Engage in writing as an act of intellectual and critical inquiry.
- Acquire an introductory understanding of research skills necessary for academic writing.
- Begin to develop strategies for participating in discourse communities beyond the classroom.

Library: This course is also designed to help introduce you to library research. This includes not only finding sources, but also evaluating their credibility. We will have two library orientation sessions with our library liaison to help you get started, but those should not be your only visits to the library for this course. It is very easy to get lost in a sea of confusing and contradictory information. The library liaison can help you find the right tools and strategies to sort through that information more efficiently and effectively.

The specific learning outcomes for information literacy for First-Year Seminars include being able to:

- Identify and articulate the need for information relevant to a specific purpose or goal.
- Select the most appropriate investigative methods for different information needs and develop and employ effective search strategies to locate useful information.
- Evaluate information and its sources critically and incorporate selected information into personal knowledge bases and value systems.
- Understand the economic, legal, and social issues surrounding the use of information and access, and use information ethically, wisely, and legally.

Texts:

Voodoo Science: The Road from Foolishness to Fraud, by Robert L Park.

Nonsense on Stilts: How to Tell Science from Bunk, by Massimo Pigliucci.

Snake Oil Science: The Truth About Complementary and Alternative Medicine, by R. Barker Bausell.

The St. Martin's Handbook, by Andrea A. Lunsford. This text may also be required for other writing courses at Lafayette.

Extracurricular Activities:

One of the goals of the First Year Seminar is to introduce you to the broader intellectual life of the College. Accordingly, you will be required to attend at least one extracurricular lecture, brown bag, or Williams Center event, and write a very brief (1-2 pages) paper about it. I will notify you of opportunities as I become aware of them, but you should also be alert to other opportunities that may interest you.

Writing Assignments:

Writing plays an important role in every discipline at Lafayette. You will find that writing is a helpful tool for *learning* about a topic, as well as an essential tool for communicating your findings.

In this course, you will have four main written assignments as indicated on the syllabus. Further details will be provided on the individual assignments. There will also be postings on specific topics and occasional very short papers.

All First Year Seminars are associated with the College Writing Program. This program provides individualized instruction to help you identify potential writing problems before your professor grades a paper. You will meet with a Writing Associate (WA) four times this semester. The WA assigned to this course is Matthew Warrener. In these conferences (which typically last about 30 minutes), you will discuss drafts of your writing assignments. The conferences will give you an excellent opportunity to ask questions and to discuss your writing in detail. All students, regardless of their writing abilities, should benefit from working with the WA, and therefore you are required to participate.

You will submit two copies of drafts of most of your papers a little over a week before the final copy is due. (See syllabus for specific dates.) One copy of the draft will be reviewed by me, and returned to you with suggestions primarily focused on the content and organization. A second copy will be given to the Writing Associate for use during your writing conference. It is your responsibility to make and keep your WA appointment. The WA will inform me of any late or missed appointments.

After your conference with the WA, and after you review my comments about your draft, you will prepare a final copy of the paper for submission at the start of class on the due date. Only the final copy will be graded. Normally, no final copy will be accepted before a conference with the WA, and subsequent revision, has occurred. It is important that you realize that editing and revision are important parts of the normal process of writing about sophisticated topics. There will be a penalty for late submission, unless there are significant extenuating circumstances.

The four main writing assignments for this course are as follows:

- Paper 1: A post (equivalent to about 2 pages) documenting an example of a scientific-sounding claim in the news, media, advertising, or elsewhere in everyday life, and looking for obvious signs of science and pseudoscience. This will be posted on our course WordPress site. Commenting on other posts and incorporating feedback into your own post will be an important part of this assignment.
- Paper 2: A 5-page paper focusing on one aspect of the controversy surrounding teaching evolution in schools.
- Paper 3: A short opinion piece (about 5 pages) about an issue related to alternative medicine.
- Paper 4: An 8-page paper exploring in detail one particular scientific-sounding issue that interests you, with the goal of determining if it is science or pseudoscience.

Specific details and deadlines will be given with each assignment.

Additional Writing Assignments: There will be several other small writing assignments throughout the semester. Specifically, these include at least the following:

- One short (1–2 pages) paper about an extracurricular event or lecture you attended.
- Regular posting of questions or comments about the readings on the WordPress site (more details are below).

- Other very brief papers about topics that may arise during the semester.

Reading Questions and Comments:

We will read a number of different sources throughout this course. The main class time will be used to discuss those readings. It is important that you read the assigned material ahead of time and come to class prepared.

In order to encourage reading ahead and to promote useful discussion, I will post a brief set of questions on the course web site for most classes where we have a reading assignment. For each class, you should post a question or brief comment you had about the readings. These questions and comments will help start and direct our classroom discussions.

Oral Discussions and Presentations:

Throughout this course, you will be expected to be an active and informed participant in daily discussions. In addition, towards the end of the semester, you will be required to give a slightly more formal oral "Progress Report" on the topic of your final long paper. This will not be a full-scale formal presentation, but, instead, will be an opportunity for you to share with the class what you have discovered so far, and to get feedback from your classmates. You will likely find the process of organizing your report and incorporating feedback to be very helpful in revising your written paper.

Grading:

Your grade will be based on papers 1, 2, and 3 (15% each), paper 4 (25%), oral presentation and other brief papers (15%), and class contribution (15%).

Your Responsibilities:

The student work in this course is in full compliance with the federal definition of a four credit hour course. I anticipate you should spend approximately 12 hours per week (including class time) for this course.

Read the assigned readings before coming to class. I do not intend to spend class time simply repeating the readings. Instead, class time will be used primarily to *discuss* those readings, answer your questions, and explore the application of the ideas in the readings to the world at large.

Attend and Participate in class. This course relies on you being involved. Your perspective is important and will enrich the experience for everyone. I expect you to attend and participate in every class, unless there is a good reason (such as illness or an away competition). Fifteen percent of your grade is based on your active involvement in the class. Class time will also be used to announce changes to the syllabus. It is *your* responsibility to keep up.

Keep up with all the assigned work. I have spaced the assignments throughout the semester so that you should have ample time, if you plan ahead. Don't let yourself fall behind. Plan ahead. I am here to help. If you start on your papers ahead of time, I will be available to help you if you get stuck. Don't wait until the night before an assignment is due before starting it.

Academic Honesty:

The fabric of science, and indeed any intellectual endeavor, is built on the integrity of all involved. Accordingly, I take academic honesty very seriously. You should work with

others and learn from others, but work you turn in *as* your own should *be* your own. I expect that you will abide by the “Principles of Intellectual Honesty” appearing in the Lafayette College Student Handbook.

Disabilities

In compliance with Lafayette College policy and equal access laws, I am available to discuss appropriate academic accommodations that you may require as a student with a disability. Requests for academic accommodations need to be made during the first two weeks of the semester, except for unusual circumstances, so arrangements can be made. Students must register with the Office of the Dean of the College for disability verification and for determination of reasonable academic accommodations.

| Andrew Dougherty Fall 2013 Office: Hugel Science Center 030 Lab: Hugel Science Center 025 610-330-5212 doughera@lafayette.edu | | | | | |
|--|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|
| Time | Mon. | Tues. | Wed. | Thurs. | Fri. |
| 8:00 8:30 | | | | | |
| 9:00 9:30 | | | | | |
| 10:00 10:30 | <i>prep</i> | <i>prep</i> | <i>prep</i> | <i>prep</i> | <i>prep</i> |
| 11:00 11:30 | FYS 175 HSC 017 | Phys 111 HSC 100 | FYS 175 HSC 017 | Phys 111 HSC 100 | FYS 175 HSC 017 |
| 12:00 12:30 | | (12:15) | | (12:15) | Physics Club |
| 1:00 1:30 | <i>Office Hours</i> | | | <i>Office Hours</i> | |
| 2:00 2:30 | | | | | |
| 3:00 3:30 | | | | | |
| 4:00 4:30 | Department Meeting | Faculty Meetings | Physics Club | | |

| Syllabus | FYS 175 | Fall 2013 | |
|--------------|--|--|---------------------------------|
| Aug. | 26 | Welcome & Introduction | |
| | 28 | Park Ch. 1: It's Not News | |
| | 30 | Library Orientation—Skillman 004 | |
| Sept. | 2 | Park Ch. 2: Belief Gene | |
| | 4 | Pigliucci Intro.: Demarcation | <i>Draft Paper 1 Due</i> |
| | 6 | Pigliucci Ch. 1: Hard and Soft Science | |
| | 9 | Pigliucci Ch. 3: Pseudoscience | |
| | 11 | Teaching Evolution | |
| | 13 | Library Research—Skillman 004 | Paper 1 Due |
| | 16 | <i>Judgment Day</i> | |
| | 18 | <i>continued</i> | |
| | 20 | <i>Judgment Day</i> Discussion | |
| | 23 | Pigliucci Ch. 7: Intelligent Design | |
| 25 | Park Ch. 3: Placebos | <i>Draft Paper 2 Due</i> | |
| 27 | Bausell Intro. & Ch. 1: Alternative Medicine | | |
| Oct. | 30 | Bausell Ch. 2 & 3: Placebos | |
| | 2 | Bausell Ch. 4 & 5: Clinical Trials | |
| | 4 | <i>Writing Workshop</i> | |
| | 7 | Bausell Ch. 6 & 7: Control Groups; Credibility | |
| | 9 | <i>Frontline: Alternative Medicine</i> | Paper 2 Due |
| | 11 | <i>continued</i> | |
| | 14 | <i>Fall Break</i> | |
| | 16 | Bausell Ch. 8: Acupuncture | |
| | 18 | Bausell Ch. 9 & 10: The Placebo Effect | |
| | 21 | Bausell Ch. 11 & 12: CAM Results | |
| | 23 | Bausell Ch. 14: Wrap-up | |
| | 25 | Park Ch. 7: Electromagnetic Fields | <i>Draft Paper 3 Due</i> |
| | 28 | Park Ch. 8: Courts | |
| 30 | <i>Cell Phones</i> | | |
| Nov. | 1 | <i>continued</i> | <i>Paper 4 Proposal Due</i> |
| | 4 | <i>continued</i> | |
| | 6 | <i>continued</i> | Paper 3 Due |
| | 8 | Pigliucci Ch. 6: Global Warming | |
| | 11 | <i>continued</i> | |
| | 13 | <i>continued</i> | <i>First Draft Paper 4 Due</i> |
| | 15 | Oral Progress Reports | |
| | 18 | Oral Progress Reports | |
| | 20 | Oral Progress Reports | |
| | 22 | Oral Progress Reports | <i>Second Draft Paper 4 Due</i> |
| 25 | Oral Progress Reports | | |
| 27–29 | <i>Thanksgiving</i> | | |
| Dec. | 2 | Pigliucci Ch. 10 & 11: Science Wars I and II | |
| | 4 | Pigliucci Ch. 12: Experts? | |
| | 6 | <i>continued</i> | Paper 4 Due |