8/25/04 Introduction
Today's lecture was primarily an introduction to the class. The online lecture on land-grant universities was useful in explaining the original purpose of Virginia Tech. I had never considered why many state universities have such a heavy focus on agriculture. Higher education is often taken for granted today, and the role of the university in society is changing; it was very useful to read the purpose and history of land-grant universities. My only suggestion here is to include more recent articles.

9/1/04 IT and Science
I don't have a very good grasp of computers, so I was pleased with this lecture. It's good to get a bit of history behind the Internet, and it was explained well. The online information was useful, but it may have been more valuable if the links were more recent - information technology changes very rapidly, after all. I also wish this lecture had been able to go into more detail.

9/8/04 The Scientific Method
Today we learned about the development of science and the scientific method. I've read a lot about the structuring of scientific knowledge a few years ago. I was living in Kansas in 2000 right after the state board of education decided to delete evolution from public school curricula. The professor I was working for was a very enthusiastic defender of evolution, so I was drawn into seeing how the public thinks of "science". One of the more popular misconceptions centers on the definition of the scientific method:

I thought today's lecture defined the scientific method well, but it may have been helpful to mention how public perceptions can affect how science is received. The most interesting tidbit of the lecture was how statistics has refined scientific methods in recent years. It's very easy to take statistical knowledge for granted! I also thought the first two links about the scientific method had good information. The third link, [http://www.selu.edu/Academics/Education/EDF600/Mod3/](http://www.selu.edu/Academics/Education/EDF600/Mod3/), wasn't useful to me - it's difficult to make sense of a Powerpoint presentation without a presenter.

9/15/04 Good Laboratory Practice
I worked previously as a technician in a cell biology lab. Although we didn't have to work under good laboratory practices, we had to carefully maintain an area for human cell culture. We also worked with adenovirus, which is mostly harmless but can infect
human cells (our strain couldn't replicate, though, except in special cell cultures).

Keeping up with the required paperwork to maintain the lab was a major chore. It would be a severe strain to attempt to run a lab under good laboratory practices, judging from today's lecture (given by Jean Cobb). I enjoyed hearing about the corruption and misleading data some companies tried to pass off as real research. It's terrible that such things happen, but at least it helps to know that people who fabricate scientific information are caught and punished. I think the lab tour would have been more useful if we had known more about what type of research the lab had been conducting under GLP.

9/22/04 Scientific Writing I
I took a class in scientific writing as an undergraduate, so the material in this lecture was pretty familiar to me. Not that I'm good at it - it's easy enough to recognize bad writing, but horribly difficult to improve it. I think that a shorter lecture, followed by some examples of bad writing, might be more useful. Or just hand out examples of well-written papers and poorly-written papers. Maybe we'll focus more on that when we read next week's paper.

Dr. Brewster mentioned at the end of lecture that Master's students are expected to produce three papers' work of data by the time they graduate. Is that in the whole university, or just for specific majors? I know that all my work will contribute to maybe two papers, but molecular biology requires a lot of work for a publication.

9/29/04 Scientific Writing II
Today we discussed the Gopen and Swan article in class. The article brought up a number of organizational concepts important for scientific writing; however, I had a hard time understanding them. I can't help but find it ironic that this paper, which urges writers to clarify their thoughts, is bogged down by needlessly complex English. Jargon is jargon, whether it's a scientific term or a fancy word. I don't think it was worth spending an entire class period talking about this paper when ten or fifteen minutes would have sufficed. I liked the entomology article much better, especially because the author had a good sense of humor.

10/6/04 Biological compliance
Today's lecture was by Dr. Tolin on the subject of biological compliance. This class was useful as a reminder of the safety considerations necessary when working with many plant pathogens. My lab works with downy mildew, which does not spread easily (when we propagate the pathogen, the spores will die within ~20 minutes unless they make contact with a plant leaf), so I don't usually worry about safety issues. More virulent pathogens or pests, however, require more careful consideration, and it's good to be reminded of these safety and environmental issues. It was especially useful to know where to find more information on pest and pathogen regulations and permits. It's a pity that red tape seriously hampers research, but I know some of these restrictions are necessary for safety. Overall, I thought this was a good lecture.

10/13/04 Designing research projects
This lecture examined the design of a research project. I really didn’t get a lot out of this lecture, especially since I took statistics for research over the summer. It seems like there’s a lot of emphasis on terms during this lecture, rather than on understanding of the underlying statistics. The example on pig back fat was a little odd, especially since the phrase “pig back fat” loses any meaning after you’ve heard it twice! A different experimental example might have made things clearer. I think it would be a much better lecture if you cut out a lot of the jargon and focus more on why organization is required for efficient research.

10/20/04 Exploratory data analysis
Today, we were told about exploratory data analysis. EDA is a method to examine data beyond regular statistical methods, which allows you to look for previously unseen and unanticipated trends in the data. This lecture mentioned several ways that statistics are used to deceive the reader, which is an unfortunately common flaw in the media and even some scientific papers. We also looked at ways to display multiple forms of data on a 2D or 3D chart. The idea of EDA is useful, but I think this lecture could have been combined with the discussion of research project design.

11/3/04 Teaching and the art of lecturing
Today’s lecture was about teaching effectively, and was presented by Dr. Fell. I think this class is really important, since teaching is a huge component of academics and grad school, but very few people talk about how to teach effectively. I especially liked the recommendation to write out your talk rather than make an outline, which helped me effectively organize my own research proposal seminar. After that, I didn’t worry about what to say – just how to say it! Next time this class is held, it might be good to assign a brief, five-minute talk on a subject of interest, to practice these skills in front of a class.

11/8/04 Scientific and professional presentations
Today’s lecture was on the art of formal presentations, given by Dr. Salom. This lecture is also very valuable for young grad students, although again we should have followed it up with practice talks in class. The advice was really good; I’ve heard much of the same information before at other seminars on how to give good presentations. One lecture I attended, given by a voice instructor at Harvard, emphasized good body language as well – standing up straight, projecting your voice, etc. This class was really good, especially coming right after Dr. Fell’s lecture.

11/10/04 Distance Education
I wasn’t able to attend this lecture due to extremely heavy coursework that day. This lecture discussed distance education, which has not been something I have had experience with in my education. Distance education can be a very useful system of expanding education on limited resources; however, most classes I’ve heard about suffer from poor organization. It’s highly valuable to have online resources (such as Blackboard) to augment regular classes. For a class that’s entirely online, however, I think it’s difficult to motivate students. Without face time with instructors, I think it’s important to get a lot of feedback, which means that a good online class should take as much time and organization as a regular class. The main advantage is that once a class is
set up, the class can be reused with only small modifications, allowing the instructor to focus on the students. It’s an interesting subject of increasing importance, but I still think this topic is a little removed from the subject of this course.

11/17/04 Grant writing

Today’s lecture was on grants, and was given by Dr. Tolin. This lecture was really useful, and discussed how to find money at the university research level. The same day we had this class, I had a mock grant panel in another class, so these subjects dovetailed nicely. Grants need to be able to describe your work in a clear, concise way, and get its broad interests across to have a chance in the highly competitive world of funding. I now know it’s very easy to misunderstand grants, especially if each one has a different format! This is a good lecture, but it should have come right before or after the lectures on scientific writing.

12/1/04 Ethics

The lecture today was on ethics, as presented by Dr. Pfeiffer. The lecture was followed by a further discussion that evening on lies and ethical dilemmas. One example, of copyright infringement using an illustration, was really interesting to me. Artists are constantly reusing clever ideas, recopying and adapting existing works for their own use. However, modification of an existing picture is a really touchy issue for some people – especially on the Internet, where it is extremely easy for someone to steal and claim an artwork. Sometimes people will steal by taking a picture and redrawing it with a few slight modifications to make it “theirs”. I didn’t know that this is actually considered acceptable evasion of a copyright. I’m a bit concerned by that, especially when people are making money off the modified image. For the example in class, the original ownership of the image is vague, so the students had a legitimate right to contest the publisher. However, that’s more of an exception rather than a rule.

The evening discussion was also interesting, particularly the lecture on lying given by Dr. Jubb. It’s hard to draw a line between minor lies and major lies sometimes, especially since I’ve seen people (at a different university!) run all over that line. The videos are a bit dated, but they brought up some good ethical issues as well – like “deleting” data that don’t agree. It was good to have a discussion with other professors to hear their thoughts on the matter.

These lectures were good, and it’s important to have a discussion of these issues in this class.

12/3/04 Intellectual properties

Our final lecture, given by Dr. Nessler, was on intellectual properties. This lecture was useful, as it’s difficult to understand the differences between patents, trademarks, and copyrights. I didn’t know how universities handled patents from faculty or graduate students, but it’s clearly a very important issue for researchers! This lecture is very relevant, and it’s a good class to end on.