Topic 1 • Science Literacy Book Report  (100,000 points)
PHYS-1130 (5) / PHYS-1150 (6) • Fall 2007

Purpose

Science Classes

As a student, you have received science and science related information from your teachers. Whether you believe it or not is up to you. But a professional has taken the time to determine what sorts of things are important to know and with how much detail, both for the purposes of the courses you are taking and for the more general purpose of “Science Literacy”, to help make you a better citizen and better able to function in our science & technology driven 21st Century.

How Will I Get Science Information in the Future?

For some of you, your courses at Western Michigan University may be the last time you will have the benefit of someone directing what science you are exposed to. So, what happens when you get to the “real world”? Well, you may be bombarded with information from all sorts of sources: your job, newspapers, magazines, books, television, radio, movies, the Internet, friends, conversations overheard while standing in line somewhere—you name it. What these methods may lack, though, is the control and expertise of your teachers. You can find all sorts of amazing information on the Internet, but you would have to be very naive to believe 100% of everything you read there. Much of our news is dominated by politics, but how much science do our politicians know? At the moment, we have exactly one professional engineer and one physicist in the House of Representatives (both of these men are from Michigan—you should know who they are, but probably don’t), none in the Senate. Most of Congress is made up of lawyers. While there is nothing wrong with studying the Law per se, legal arguments do not follow the same rules and purposes of scientific arguments. Therefore there is nothing that requires an environmental cleanup bill, for example, to have anything to do with either the environment or cleaning it up. Likewise, the talking heads we get our news from on TV are not trained in science and technology for the most part. I don’t know what Dan Rather or Connie Chung majored in at college, but I can probably bet it wasn’t Physics. They may have, unlike you, been able to graduate from college without ever having had a Physics course. Even on the cable channels, one of the hosts of a computer show I used to watch is now doing a cable show on gardening—go figure.

How will you evaluate information on your own? This is possibly something that you have never thought about, but Dr. Phil and other professionals have. Dr. Phil’s approach is to have you read a book and examine what you read and how it affects you, as well as whether you believe it. (You don’t have to.)

Learning to “Parse” Information

Evaluating what you read in this context is very much in line with definition 3 of the verb parse:

parse (pâr’s) verb

parsed, pars·ing, pars·es verb, transitive

1. To break (a sentence) down into its component parts of speech with an explanation of the form, function, and syntactical relationship of each part.
2. To describe (a word) by stating its part of speech, form, and syntactical relationships in a sentence.
3. To examine closely or subject to detailed analysis, especially by breaking up into components: “What are we missing by parsing the behavior of chimpanzees into the conventional categories recognized largely from our own behavior?” (Stephen Jay Gould).
4. Computer Science. To analyze or separate (input, for example) into more easily processed components. Used of software.

verb, intransitive

To admit of being parsed: sentences that do not parse easily.

[Probably from Middle English pars, part of speech, from Latin pars (dramatis), part (of speech).]

Source: Microsoft Bookshelf ‘95 (American Heritage Dictionary of the English Language (Third Edition))

Dr. Phil’s Definition of Science Literacy

science literacy n. An exposure to science in a historical context that serves to allow a person to observe the world around them with understanding, deal with technological applications at home and work, appreciate the distinction between fact and speculation in the media and politics, have a working knowledge of numbers and the scale of the universe, and be able to pursue more information if desired, as a function of everyday life.

Philip Edward Kaldon, Fall 1995

Books as a Source of Information

From all the sources listed in How Will I Get Science Information in the Future?, most are very difficult to evaluate. Dr. Phil can’t easily watch hours of VCR tapes or interview your friends along with every paper he reads to compare your impressions with the actual information being presented. So by narrowing the choices to one medium – books – we can have a little control and consistency between papers.

For more than ten years Dr. Phil has been building up a booklist of suitable books. They are, as you shall see, not just Physics books, but cover all the Natural Sciences, Engineering, Computers, Technology, Medicine and the Morality and Ethics of using these. The total list is kept around a hundred titles. Books come on and off the list from time to time, sometimes because Dr. Phil gets sick of reading too many papers on Airframe or Jurassic Park, etc., and sometimes because some books work better with some classes (such as PHYS-3090) than others.

Because this is not strictly a Physics paper but a Science Literacy paper, the range of books is considerable. There are fiction and non-fiction titles, biographies, science fiction, mysteries and technothrillers – books that straddle the line between science fiction and current reality – from some popular best-selling authors as Tom Clancy and Michael Crichton, covering topics that include Physics, Biology, Chemistry, Engineering, Computers, Mathematics, Technology, Medicine, etc.. The list is anything but boring.

It is easiest to pick a book you have not read before. And if you pick a title from the booklist, that’s it. However, you may decide that (a) you have read everything on the list, (b) read everything you think is interesting on the list or (c) waited too long to get the book(s) you were interested in from the library and are now stuck. You may read a book that isn’t on the booklist, but you must get Dr. Phil’s approval beforehand and be prepared to hand in a draft of your paper at least one week before it is due. If you go ahead and write a paper on a book that Dr. Phil has not approved anyway, there is a 100,000 point penalty.

Movies as a Source of Information

It turns out that many of the books on Dr. Phil’s booklist have some connection to a movie or a TV program. Many of these are mentioned in the booklist. If you are tempted to avoid reading a book by watching the movie version – don’t. For one thing, the movies are almost always different than the books. And not only has Dr. Phil read all the books, he has seen all the movies (and owns most of both). So if you just watch the movie, you are going to get caught (and it’s a 90,000 point deduction). Secondly, in most cases, even jaded students like you will usually conclude that the book is usually better than the movie. While there is a lot to say about movies, there isn’t the time to contain all the information content of the book. Movies, at best, hold the flavor of the book.

Hearing said that, it can be worthwhile to compare what is in the book and movie of a particular combination. Sometimes Dr. Phil uses Book/Movie combinations for his second-semester Physics courses (PHYS-1150 and PHYS-2070 at WMU). You can, however, do this on your own IF you agree to a change in the rules. Having more to evaluate means you have to write a longer paper – it’s only fair. You also have to split your paper between the book and the movie.

Scope of the Paper

A booklist only about Physics topics is likely to be a very short and boring list. While it is true that “Everything is Physics”, there is nothing more pathetic that someone reading a really good medical story and then writing a paper where you try to find the one or two things that seem like PHYS-2050 Physics,
The Assignment

1. Select a book from the “approved booklist” or get approval for a different title from Dr. Phil.
2. You should not read a book that you have already read, it only makes the assignment harder. You may find that a book you are already reading for another class may be acceptable.
3. Failure to read an approved book is a 100,000 point penalty.
4. If you have ever had Dr. Phil before and you read any of the best-seller type books (Crichton, Clancy), you must read a “serious” book for this book report. Failure to comply with this rule will result in an 80,000 point penalty. If you try to submit a report on the same book that you have read for Dr. Phil before, there will be a 100,000 point penalty. This is a science literacy assignment after all, so we want you to learn something new.
5. Book titles can be reported in a space provided on the first and second exams. If you don’t have a book title in mind, or you don’t remember it, you can leave the space blank. This is partly so Dr. Phil can see what people are doing and partly to remind you of this assignment. But it is not required.
6. Read the book, especially with an eye as to how science is portrayed, what you may have learned that was new to you, whether you believe it to be accurate or whether you feel that the science issues were well explained. Remember that this is an assignment on science and technical literacy, so what you already know (or don’t know) is important.
7. Each book in the booklist has a brief description of some points that Dr. Phil came up with. You do not have to agree with Dr. Phil. This is an opinion paper and your opinion matters. Personal anecdotes that tie in with what you have read are appreciated.
8. This assignment is not just about Physics. This booklist is about science, engineering, technology, computers and the history, application, ethics, morality, and understanding of it all. So the paper is about this, too. To simply rate the book based on the “Physics” may be to miss the entire point – or in this case, a good chunk of the 100,000 points.
9. Write a 4 to 5 page report, typed, double-spaced and a single simple cover sheet, on what you read, paying attention to the assignment. You can write more if you feel you need to, but more will not translate automatically into a higher grade. Good grammar and spelling are expected. Standard Format.
10. OR If you want to write a paper comparing and contrasting a book with the movie version of the book, in the context of the assignment, you can expand the page count to 7 to 8 pages. (There is no extra credit for doing this, but sometimes it can be fun to really tear into both movie and book.)
11. Dr. Phil is expecting that a “B” paper will satisfy the above requirements. Exceptional papers will be rewarded; problems will be deducted.
12. Late papers will drop an additional letter grade (10,000 points) per calendar day, starting after 5pm at the end of the Grace Period.
13. Papers are due at the start of class, or can be dropped off in Dr. Phil’s mailbox at the Physics Dept. office by 5pm on the due dates listed below.

NOTE: The most popular books, i.e. the ones Dr. Phil has read the most papers on, have been written by Michael Crichton (The Andromeda Strain, Five Patients, The Terminal Man, Congo, Jurassic Park, Airframe and Timeline) and Tom Clancy (The Hunt for Red October and The Sum of All Fears). They wouldn’t be popular (and rich) authors or have their stories turned into hit movies unless their writings were a lot of fun. Now not all of these nine books may be authorized for this particular semester, and no other Crichton or Clancy books will be approved, so don’t bother asking. But despite the fact that they show up in a lot of papers, there is no problem with many people writing their papers on the same book.

Content

This is an Opinion Paper

For many of the papers you may have written in high school or college, they have not wanted you to have or express your own opinions. But this is exactly what we want here – Dr. Phil wants to know what you think, whether you liked the book, etc.

It is All Right to use “I”

Unlike some college papers, it is not necessary to write in a formal style. Since this is an opinion paper, it is okay – even encouraged – to say that “I think that…”.

This is Not a Fourth Grade Book Report

Back when you were a kid, most book reports consisted of “I read Book X. This happened and then this happened and then this happened.” What such a report really ends up being is just a discussion of the plot. The problem with this is three-fold: (1) Dr. Phil has already read your book, so he knows how the plot goes. (2) Writers like Michael Crichton and Stephen Hawking are best-selling authors because they get paid more than you do to write – they’re better at it. Why would Dr. Phil want to read your version of The Andromeda Strain when he can read the book? (3) Just replaying the plot of a novel or a list of topics covered in a non-fiction book or the events in a scientist’s life in a biography does not involve any analyzing of the subject. It is this analysis – thinking about what you just read, thinking about what you already knew and what you have learned – that is the heart and soul of this science literacy assignment.

You Can Be as Serious or as Light as You Choose

Some of the books are more serious in tone than others. Several of the books regard rather controversial topics. You are free to avoid them. One semester a student asked if they could write their paper as if they were writing a letter to someone and talking about their experience. Sure – as a writing technique it’s sort of a crutch, but it got the job done. Others have taken a more humorous tone, or have gotten hostile or offended. Just remember that you should be able to justify your comments. What is Dr. Phil supposed to make of a paper that says the book didn’t do anything for them and it was boring and too technical after Chapter Four, and then in conclusion they said it was a great book and they’d recommend it to anyone?

You Do Not Have to Agree With Dr. Phil

Most of these books are on the list because Dr. Phil likes them and they cover some subject areas that should make for good papers. However, everyone’s experiences and preferences are different. Very few people in the world are Physicists or Physics teachers, and there are certainly very few Dr. Phil’s in this world. So it would be surprising if you responded to every book the same way as Dr. Phil did – especially since a good chunk of the book list was read a long time ago when he was a kid and not a Ph.D. Physicist.

Since Dr. Phil asks for your opinion, you are free to give it. You hate the book. You can hate the assignment. You can decide that you didn’t learn a thing from the book. Fine. Great. Wonderful. Now just write it up. Give examples, be specific. Some of the very best papers in a particular semester have come from the same book where the students reach completely opposite conclusions.

Suggestions

The following are suggestions for ways to start your paper (or start thinking about your paper) if you are stuck.

1. Why Did I Choose This Book?
2. Failure to read an approved book is a 100,000 point penalty.
3. If you have ever had Dr. Phil before and you read any of the best-seller type books (Crichton, Clancy), you must read a “serious” book for this book report. Failure to comply with this rule will result in an 80,000 point penalty. If you try to submit a report on the same book that you have read for Dr. Phil before, there will be a 100,000 point penalty. This is a science literacy assignment after all, so we want you to learn something new.
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your life, many hours of watching TV & movies and what you are interested in doing. These are some of the things that will affect how you react to a book and these are some of the things that Dr. Phil would like to know about you, in order to understand your responses.

- **What Did I Learn (Or Not Learn) From Reading This Book?**

  Remember, although you might need to discuss a plot point to explain something, your paper is not about what happened in the book, it is how you reacted to what happened. When we watch a play or a movie or read a novel or play a video game, we often engage in “a willing suspension of disbelief” in order to be entertained. Most people don’t really believe in wizards casting magic spells or the plots in James Bond movies or think that there really is a Darth Vader in a black helmet and cape that can use The Dark Side of the Force, or that terrorists set off a nuclear bomb at a Super Bowl game in Denver. But going along with the author is something we do to be entertained. Now, if you don’t buy it, you aren’t going to like it — we need to know this. If you don’t think that we really sent astronauts to the Moon (and some people don’t), then that will affect how you view any book about space travel. See how this ties in with the previous topic?

- **Pick 2 or 3 Good Examples**

  This is a 4 to 5 page paper. You don’t have time to discuss every one of the topics/chapters in Stephen Hawking’s *A Brief History of Time* — so you can’t. A rule of thumb might be about a page for your introductions, a page each for two or three good examples and a page or conclusions. Provided you follow the assignment — you’ve got your four or five pages.

- **Conclusion**

  You really do have to wrap up your paper. After all, the premise is that books are one way that you might learn something about or improve your science literacy, so did you learn anything? Or did you read something that supported what you already knew? How does this assignment or this book affect your “world view”? Would you recommend this book to your friends? … to other students?

- **Draft Review (Optional = NOT Required)**

  If you wish, you may submit a typed, draft copy of your paper at least one week before it is due. Dr. Phil will take a quick read and look for (1) basic mechanical flaws and structural problems in your paper and (2) how your paper fits in with the concept of science literacy and the purpose of the actual assignment. In return, the clock stops while Dr. Phil has your paper — if Dr. Phil has your paper for two days, then you add two days to your due dates, etc. The draft will not be graded and the submission of a draft is not required. If you choose to use this option, you must turn in your draft with your final paper — if you don’t then your final paper won’t be graded. This is to keep Dr. Phil from going nuts “as I experience major deja vu from thinking that I already had made a comment about some aspect”. (Please note that the phrase “rough draft” is never used, which should suggest that the draft be fairly complete as a paper. This is just a free shot before it counts. What could be fairer?)

  **Please note:** If you choose a non-booklist but approved book, you MUST submit a Draft.

### Structure — Standard Format

- **Most of You Will Use Word Processing Software Rather Than Typing**

  The assignment describes a “typed” paper, but very few of you will actually use a real typewriter. In fact, most of you will use some version of Microsoft Word, on either a Windows PC or a Macintosh.

- **4 to 5 Pages, Double-Spaced, 1” Margins All Around**

  The goal here is uniformity of papers for everyone, as well as ease of reading for Dr. Phil.

- **Left Justified, Ragged Right Margins, Standard Indent for Each New Paragraph**

  This produces a clean left side of the page and is the easiest to read. Turning on “Justify” also lines up the right side of the page, but does so by inserting extra spaces in each line to pad them. This is fine for magazine and book publishing, where they have more control and different rules than you do, but in a paper it makes each line jerky to read and incredibly annoying. Each paragraph should be indented with either a Tab or alternately five spaces. Do not put blank lines between paragraphs — that’s padding.

### Readable Font (Courier 12, Courier New 12 – ONLY ALLOWED Fonts)

One thing Dr. Phil learned at the 2004 Clarion workshop was how much easier it is to read 115 papers when they are all in Standard Format. Now the standard will vary from professor to professor, industry to industry, but it is important to follow the rules. Since papers used to be “typed”, a typical standard font in college is COURIER — a non-proportional font that resembles typewriter print. Courier 12 point is large and easy to read, and it is readily available in some form for all printers using Windows, MacOS, Linux. Most Windows computers use TrueType fonts (TTF), and there the standard is Courier New 12 point. You can use any of the regular Courier “family” of fonts for your paper. Using Arial, Times New Roman, Old Dreadful Number 7, etc., will be penalized.

**NOTE:** There is no requirement that you “write” your paper in Courier/Courier New — only that you PRINT it out this way. Dr. Phil usually writes his fiction in “prettier” fonts like Garamond 14, Book Antiqua 12, Bookman Old Style 12 and Century Schoolbook — then converts to Courier New for printing.

- **Spelling**

  Nearly all word processors contain some sort of Spell Checker. Use it. But you must know that computers, like calculators, are basically stupid machines. A spell checker cannot tell the difference between "two", "to", "too" or "Their" — all of which are pronounced the same. Word choice in English is very specific. Misspellings, especially of the author’s name (or Dr. Phil’s name), looks sloppy, as if the paper was written at the last minute and/or without any care.

- **Grammar**

  Reasonable grammar is expected in a college paper. This requirement is loosened slightly in some papers, because some students are not native English speakers and some papers may be written in a casual, often first-person style. However, your paper is supposed to be read — if your meaning isn’t clear or your sentences don’t make sense, your paper’s grade will suffer. Microsoft Word and other modern word processors may have a Grammar Checker feature, but unlike a Spell Checker, Grammar Checkers do not work very well and only find some sorts of errors. They work best with certain types of documents, such as company memos, in order to give all company documents that same “feel”. Your best bet is to proofread your paper for readability. But even among good writers, it can be very hard to proofread your own work. So you can (1) get a friend to read over your paper and see if they understand it or (2) go to the Academic Skills Center and have someone there go over your paper with you.

### Additional Information

- **No Need For Footnotes**

  Again, this is not a formal paper in the sense of many other college papers. It is not required that you footnote, or even give page numbers, for every point that you make or quote (or phrase) you use from the book.
Four to Five Pages
Please make a note that “4 to 5 pages” does NOT mean that 3½ pages is “sufficient”. It is not. Dr. Phil interprets “4 to 5 pages” to mean FOUR FULL PAGES PLUS YOU MAY BE GOING ONTO THE FIFTH PAGE. You can write more than five pages, but there is no automatic reward for doing so. Some people, like Dr. Phil, just write “long”.

Paddling Stunts
There are all kinds of “tricks” you could employ to try to make those four pages without writing four pages. But since Dr. Phil has specified the margins, line spacing, fonts, and further suggests that you do not indent new paragraphs by thirty spaces or put one or more blank lines between paragraphs, or start the first page halfway down because you are repeating as a header the information that is already on your cover sheet – these “tricks” to pad your paper won’t work. And endlessly repeating the same phrases or thoughts will be noticed because your paper will be read. And if you want to include a long quote from your book, the proper way to include a long quote of more than two lines on a page is to single-space the quote, so that it is (a) set off, (b) easily showing that it is a quote and not your writing and (c) so that it does not take up an excessive amount of space. Sorry.

Dr. Phil has in the past received papers with 3” top and bottom margins and 2” side margins. This leaves a typing area of only 4 1/2” by 5”, coupled with a 14 point or 16 point font, and even a four page paper under these printing conditions contains almost no text. Hardly seems fair to everyone else.

It’s the worst phrase in the world for the Y2K7 student, already struggling to get to work and maintain a home life: “And there will be a paper due…”

So Just What Do You Mean By A “College Paper”?
A college paper is a reflection on you as a student, both in appearance and the quality of the work. It is expected that the writing assignments will be handled in a competent, serious and professional manner. To that end, a college-level paper by Dr. Phil’s definition contains the following non-negotiable elements:

- Typed (word processed), double spaced
- Single, simple cover sheet
- Readable standard Courier font/typeface
- Good spelling
- Reasonably clean and proofread grammar
- Stapled in upper left-hand corner
- SINGLE-SIDED ONLY!

The Cover Sheet CANNOT Possibly Be Considered To Be Page 1
(If you can’t figure out how to do this, either number your pages by hand, or put the cover sheet at the end of the computer file.)

MANDATORY DEDUCTIONS FOR FAILURE TO COMPLY WITH THESE PERFECTLY REASONABLE RULES.

NOTE: Given that printing and typing are not always carefree processes, if you find that the printer does not line up properly or is otherwise giving you trouble at the last minute, write “Printer Trouble” on the back of the last page and very briefly describe your troubles; this lets Dr. Phil know that you were under duress and wouldn’t normally turn in a bad looking paper. You can then drop off a cleanly printed copy of the paper after the deadline, if one is required. PLEASE! Keep copies of your paper on two floppies.

IF YOU USE A REAL TYPEWRITER, then spell checking and corrections are not automatic. Make sure, however, that you go over typed papers and make minor corrections with a pencil.

IF YOU DON’T CARE ABOUT YOUR PAPER, WHY SHOULD DR. PHIL?

The Seven Statements
If you ask Dr. Phil what he wants in a paper or how to start, this is what he will tell you:

1. Do not spend the whole paper summarizing the plot (assume Dr. Phil has read the book – he has) and
2. Do not cheat and just rent the movie instead of reading the book (assume Dr. Phil has seen all the movies – he has – 90,000 point penalty) (see the assignment for restrictions on movie comments),
3. You might want to explain how you chose this book (sometimes it’s because it was the only one the library still had),
4. when you sit down to read a book, you always bring something to the table, even it is that you know nothing about the subject, or have never read any science fiction or whatever – it is this stuff, what you already knew, that is part of what Dr. Phil would like to know about, plus …
5. what you learned or did not learn from the book. If non-fiction, whether the author was understandable.
6. Give a couple of examples to show me that you read the book, but you won’t be able to talk about everything. Again: DO NOT SUMMARIZE THE BOOK’S PLOT BEYOND 2 SENTENCES!
7. Any kind of personal story or anecdote or current events that connects with your book is

This paper is not about PHYSICS, but about SCIENCE LITERACY (Sciences – including Physics, Engineering, Technology, Computers, and the Morality and Ethics Involved in using same).

Due Dates

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<th>PHYS-1130</th>
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<td>Topic 1 – A Science Literacy Book Report</td>
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<td>Due Thursday 15 November 2007 at 5pm</td>
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<td>Grade Period Ends: Monday 19 Nov. at 5pm</td>
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The Grace Period Means You Can Turn In Your Paper on Thursday, Friday or Monday, as you Choose. If you submitted a Draft Paper to Dr. Phil, you must include the Draft with your Final Paper. NOTE: Watch Out For Exam 3

Supplements

In addition to the titles in this booklist, Dr. Phil expects to add some books in a supplement posted on the class web pages. Just in case you are looking for something a little different.
A Writing Sample

U-571 is about an American submarine that is sent out on a mission to infiltrate a wounded German U-boat and take its Enigma machine and codebook. The Enigma is the coding machine that the Germans used to keep their messages secret from the Allies. To not get one was to guarantee failure. Anyway, soon after the boarding crew grabs the machine, the American sub sinks and the Americans are stuck on a wounded U-boat. The movie is about what happens to them as they try to get back to America alive with the machine.

I really liked the movie and even though I don’t know how submarines work, the subs in U-571 definitely appeared realistic. The actors looked as though they had been trained in the Navy. It had excitement, adventure and tension. My one gripe is that you never get to know the characters. I mean, you how they act and how they feel at any particular moment, but you never really know them. Even though I didn’t like that, I think that wasn’t as important to the plot when the screenwriters wrote it. I think that what they did want to convey is what makes a captain a captain, because a lot of the movie is the lieutenant’s conflict over whether he would sacrifice a crew member or save the rest of them. Overall, this is an exceptionally good movie.

Chris Molnar, age 12
Sylvan Christian School
The Grand Rapids Press
Friday, 28 April 2000

This Example Typed in Microsoft Word 95/7.0c, with 1” margins, double-spaced and with the Courier New 12-point font, and printed on a Hewlett-Packard LaserJet 4ML printer. It is likely to be reduced to half-size in your actual handout.

So what does a paper for Dr. Phil look like? I’ve avoided simply copying what an “A” paper looks like, because then I’ll just get 25 to 100 papers just like that. But to some extent, it looks like what this young movie reviewer has done regarding the Spring 2000 movie U-571. Now obviously this a lot shorter than your assignment and Mr. Molnar’s agenda was very different than yours – he was a kid reviewing a movie for a newspaper. But in a little over half a page, Mr. Molnar has given a brief description of the plot of the story, identified that he doesn’t know a lot about submarines but that he felt that what was presented was believable, and that the characters, while not well-rounded, behaved in a believable manner. Now explain how you picked this particular book to read, add a few pages talking about what you know or don’t know about the science, engineering or computer technology (or the morality and ethics of using same) in the book you are reading, and then you’ll have a Dr. Phil book report. More or less?

THIS IS WHAT THE BOOKLIST (PAGES 12-26) LOOKS LIKE:

First Up

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| LII,LVI |

When I first started thinking about a booklist, it was because I had heard of an engineering school that required all of its freshmen to read Frankenstein. Not the 1930s movies, but the original early 19th century ghost story. Although there are other contenders, I personally date Science Fiction from the writing of this book. This is a story in ethics, of taking responsibility for your science and your creative genius. So even though I don’t have a good citation for this, surely you can find a copy of this work somewhere. If you’ve only ever seen the old black & white movies, you’ll be very much surprised.

* Science People

H W K L V

Surely You’re Joking, Mr. Feynman

LII,LIV

and

H W K L V

What Do You Care What Other People Think? by Richard Feynman

LII,LIV

Both books are about the race to figure out the structure of DNA. Watson’s is the classic that surprised many with its accuracy tale. You must read them both for this assignment. For those of you who might get caught up in the fun, there is another (non-science and therefore not eligible) book, Trece y Bustí by Richard Leighton, that documents Feynman’s last great adventure to try to visit legendary Tannu Tuva in the heart of Central Asia, having once seen only a postage stamp from the place and being amazed that the country absorbed by the USSR had a capital with no vowels. One just has to want to visit a place like that, if you’re Dick Feynman. (There is also a movie, *Infinity*, about the Los Alamos years, with Matthew Broderick and Patricia Arquette as Mr. & Mrs. Feynman, but no one has ever seen it – it showed up in Holland at the Knickerbocker Theatre in the summer of 1997.)

H W K L V

Genius: The Life and Science of Richard Feynman, James S. Gleick

LII,LIV,IX

For those of you who might get caught up in the fun, there is *What Do You Care What Other People Think?* by Richard Feynman. This is a very complete, and often poignant, story of a very complex and unconventional scientist (who never seems to do ordinary teaching). Well written, but I warn you that physicists seem to like it!

H W K L V R

The Double Helix, James D. Watson

LII,LIV

-or-

H W K L V

What Mad Pursuit, Francis Crick

LII,LIV

Feynman’s own books at the beginning of the list are a lot of fun, but they are his stories, the way he remembers them. This is a very complete, and often poignant, story of a very complex and unconventional scientist (who never seems to do ordinary science, and therefore not eligible) book, Trece y Bustí by Richard Leighton, that documents Feynman’s last great adventure to try to visit legendary Tannu Tuva in the heart of Central Asia, having once seen only a postage stamp from the place and being amused that the country absorbed by the USSR had a capital with no vowels. One just has to want to visit a place like that, if you’re Dick Feynman. (There is also a movie, *Infinity*, about the Los Alamos years, with Matthew Broderick and Patricia Arquette as Mr. & Mrs. Feynman, but no one has ever seen it – it showed up in Holland at the Knickerbocker Theatre in the summer of 1997.)

H W K L V R

The Double Helix, James D. Watson

LII,LIV

Watson’s *Double Helix* has been the classic of a generation; Crick’s *What Mad Pursuit* puts a lid on some of Jim’s exuberant self-aggrandizement. One of Watson’s creations is a character named Rosie, the personification of the embittered old maid of science – who just happened to do the X-ray diffraction work crucial to W&C’s Nobel Prizewinning theory without her knowledge. The problem is that “Rosie” didn’t exist, and this author wants to try to set the facts straight. (The Nobel Prize committee does not award prizes posthumously, which is why you didn’t know.)
Topic 1: The One Page Version (100,000 points)

1. Pick a book from the booklist. If you don’t want to use a book from the booklist, you must get approval from Dr. Phil and turn in a Draft Paper at least a week before the due date. If you had Dr. Phil before, you can’t use the same book and you can’t read a second best-seller, if you read a best-seller the first time.

2. Read the book. This is a Science Literacy assignment, not just Physics. So read the book with an eye toward what you finding about all the sciences, engineering, technology, computers, medicine, and the morality and ethics of using them. Is the author believable? Understandable?

3. Think about what you brought to the table before you read the book – what you know, your experiences.

4. Consider what you learned from the book. Is it new to you? Or is it something you already knew? This is an opinion paper, so what you know and what you think does matter. You do not have to like your book.

5. Write the paper. Do not just retell the plot or story. Dr. Phil has read the book and so have you. Start from there. You might begin by telling why you selected that book. Then pick 2 or 3 things and talk about them in the context of (3) and (4) above.

6. Be careful to make sure you are talking about the book your paper is on. Many of these books have movie versions – Dr. Phil has seen them and knows the differences. He has also read all the books. (You may choose to write a paper about both book and movie, adding in a section about the differences between the two, as well as the assignment, but the page count goes up to 7 to 8 pages.)

7. The paper should be written in English with correct spelling and reasonable grammar. Because it is an opinion paper, you may use the word “I” as “in that I think that…” (first-person is acceptable).

8. The paper should be 4 to 5 pages typed (probably on a PC or Mac using a word processor in Fall 2005), double-spaced, with 1” margins all around, a single simple cover sheet, and numbered pages. The cover sheet cannot be page 1, and 4 to 5 pages means that there are at least 4 complete pages of text without extra blank lines at the beginning or end. You may write the page numbers by hand if you wish.

9. Most computer printers and word processors allow you to control the font (lettering) size and style. Acceptable fonts are: Courier/Courier New (12 point). If you have printer problems, contact Dr. Phil. If you typing on a real typewriter, write Dr. Phil.

10. You may, if you want to, turn in a Draft Paper at least one week before it is due, for a free evaluation by Dr. Phil. If you are reading a book not on the booklist and Dr. Phil approved it, you must submit a Draft Paper. In either case, if you turned in a Final Paper and Dr. Phil marked it up, you must turn in that marked up Draft with your Final Paper, or your Final Paper will not be graded. The number of days that Dr. Phil has your Draft are added to your Due Date, so there is no penalty for writing a Draft.

11. Papers are due on Thursday 15 November 2007 by 5pm. You have a Grace Period that extends until Monday 19 November 2007 at 5pm – that means you can turn in your paper on that Friday or Monday without penalty. After that, there is a 10,000 point/day penalty.

12. Major penalties: Writing about the movie and not the book – 90,000 points. Writing about a book that was not approved or on the booklist – 100,000 points. Previous Dr. Phil students reading the wrong book – 80,000 or same book – 100,000 points. Writing only about the Physics in a book that isn’t about Physics – or Writing only about the plot of a book with no analysis – the fraction of 100,000 points that the offending section covers. Other minor penalties assessed based on severity/frequency (2000 points ea.)

13. Papers that meet the minimum qualifications are worth at least a “B”. Exceptional papers will be rewarded; problems will be deducted.

Dr. Phil likes most of the papers he gets, but it takes some effort to get everyone to take this assignment seriously.
wishing winning theory without her knowledge. The problem is that "Rosie" didn't exist, and this author wants to try to set the facts straight. (The Nobel Prize committee does not award prizes posthumously, which is why you didn't know.)

Foreword for this class, I mention A because (a) Rhodes is not a scientist, but like Tracy Kidder mentioned below, he is simply just a very good writer, and (b) this is absolutely the most complete history of the Manhattan Project that you'll find in an unclassified book. No matter your feelings on the ethics of the result, and events that led up to the Bomb and the incredible grouping of scientific minds in one place that did it, is one of the 20th century's great stories. To me, the best part is that he not only explains what is going on, but weaves a story that lets you understand what the scientists did and did not know and the whole politics of the Manhattan Project.

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Tunstall: A Wall Street Tycoon and the Secret Palace of Science That Changed the Course of World War II / Jennett Conant (2002) II,IV

Alfred Lee Loomis is not a household name today, but James B. Conant is at least visible in the history of science in the 20th century. President of Harvard and advisor to U.S. Presidents on scientific matters, Conant was a friend of Loomis' and the author's grandfather. Today there is sometimes a strained relationship between academic & government science worlds and the corporate science world, and Conant was not without influence, and not without problems with industry. Nevertheless, he terms the question in the post-Emerson era of how much public good rich tycoons do our society. Loomis' story combines quite the American success story with a strong personal interest in science – and the will to put his money where his mouth was. This book makes a case that it was the support from Tunstall Park that helped science win World War II, not just the big money government efforts like the Manhattan Project. Wonder if anyone has sent this book to Chairman Bly? (grr)

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Lonely Hearts of the Cosmos / Dennis Overbye II,IV,V

A look into both the people and astrophysics in the search for the origins of the universe, and also a very human tale about how grad students and researchers get treated by each other - is the Hubble constant for the expansion of the Universe equal to 50 or 100? It's a forty year old feud that takes place in public meetings and in scathing attacks in print.

H W K L V R A Brief History of Time: From the Big Bang to Black Holes / Stephen W. Hawking II,IV,V  
Probably the first physics book to stay on The New York Times best-seller list for 20 years. Very readable treatment of modern cosmology. They made a documentary movie called A Brief History of Time; probably one of the first physics movies to even run in real theaters. I first saw it at Hope College's Knickerbocker Theatre. There is actually a book called A Viewer's Companion to A Brief History of Time which Hawking describes as the book about the book about the book.

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The Universe in a Nutshell / Stephen Hawking (2001) II,IV,IX  
As Hawking himself admits in the Foreword, he never expected A Brief History of Time (1988) to be the success it has been, especially given the difficulty of getting the subject matter across to an educated public. He devoted 20 years of his life to this effort, and the challenges are considerable, not least because any text written at a high level is unlikely to be read by the intended audience, and it is difficult to see how the public in general, or the intellectual community, can resist the temptation to gnaw on problems and ideas with decreasing patience. I don't know how many of the people who bought that book did so merely to put it on prominently on their coffee tables or bookshelves as if pretending to prepare for a purpose that was never realized. I think one of the big lessons of the early days of the LHC is that the public desires of physics and information. Full of color, they sometimes resemble really good physics textbook illustrations -- you need a key to understand what the heck they're about. However, there is plenty of physics and ideas that are quite understandable to give you the base, and the chance to understand the really "far out" consequences of what might happen if physics works a particular way.

H W K LV - Infinite in All Directions / Freeman J. Dyson II,IV,V  
Dyson is a very interesting human being, besides being someone not enough people ever listen to. One of the early (1943) of quantum field theory, he's just a very good writer. He has been talking about the idea of a Large Hadron Collider - if it ever built, it would be the most powerful machine in the world. I think that Dyson's "infinite" is more in the way he writes, and the people he talks to, and the people who read it, and the stories he tells. He's not an easy writer, but he's a very good one, and he's important.

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Living Fossil: The Story of the Coelacanth / Keith S. Thomson II,IV  
The very science book I read on my own was a little Scholastic Book Service paperback that I had bought for 49 cents (or so) called Search for a Living Fossil. This is a much more complete history of the accidental discovery of the ancient fossil coelacanths were small; there is a lifesize model of a coelacanth in the first floor geology/fossil exhibit in Rood Hall on the WMU Campus.

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The right stuff / Tom Wolfe II,IV  
This very popular book about the birth of the Astronaut corps and their transformation by the media into Heroes was made into a movie that was supposed to launch John Glenn into the White House in 1984. Didn't happen. Actually, there is a lot more in the book than is in the movie, but you might want to sneak a peak at the movie if you aren't familiar with some of the gadgets of aircraft flight testing and spacecraft - the movie is mostly pretty accurate. (But don't just review the movie.)

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Fire, poisonous gasses, collisions, uncertainty about who is paying the bills -- these are all things that can make life tense on board the International Space Station. In the summer of 1979, America's neighbor to the west, Skylab, fell back into Earth's atmosphere – as a victim of solar max activity swelling the atmosphere, delays in getting the Shuttle Space fly by and a Congress too busy to buy an adapter to allow a rocket motor to be put on Skylab and save it. While we are still waiting for the assembly of the next American space station, NASA rented some space on the International Space Station. The I-170 project had to build a new space station that didn't make it to the Moon, we'll compile this compelling story. Tom Hanks always wanted to do something about this mission, and when Ron Howard ran across Lost Moon, their agents got together and... I think I have a copy of this book already.

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One of the real sleight-of-hand tricks of early 1999 was when the weird story about a kid who goes from a dead-end future in the West Virginia coal mines to building model rockets with some friends -- to getting serious about rocketry and eventually working with the Big Toy that NASA operates. For most of us, the era of Spunk is as foreign as living in a company town in the middle of nowhere.

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The Right Stuff / Tom Wolfe II,IV  
Fire, poisonous gasses, collisions, uncertainty about who is paying the bills -- these are all things that can make life tense on board the International Space Station. In the summer of 1979, America's neighbor to the west, Skylab, fell back into Earth's atmosphere -- as a victim of solar max activity swelling the atmosphere, delays in getting the Shuttle Space fly by and a Congress too busy to buy an adapter to allow a rocket motor to be put on Skylab and save it. While we are still waiting for the assembly of the next American space station, NASA rented some space on the International Space Station. The I-170 project had to build a new space station that didn't make it to the Moon, we'll compile this compelling story. Tom Hanks always wanted to do something about this mission, and when Ron Howard ran across Lost Moon, their agents got together and...

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Dragonfly: NASA and the Crisis Aboard Mir / Bryan Burrough II,IV,IX

Fire, poisonous gasses, collisions, uncertainty about who is paying the bills -- these are all things that can make life tense on board the International Space Station. In the summer of 1979, America's neighbor to the west, Skylab, fell back into Earth's atmosphere -- as a victim of solar max activity swelling the atmosphere, delays in getting the Shuttle Space fly by and a Congress too busy to buy an adapter to allow a rocket motor to be put on Skylab and save it. While we are still waiting for the assembly of the next American space station, NASA rented some space on the International Space Station. The I-170 project had to build a new space station that didn't make it to the Moon, we'll compile this compelling story. Tom Hanks always wanted to do something about this mission, and when Ron Howard ran across Lost Moon, their agents got together and...

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A Brief History of Time: From the Big Bang to Black Holes / Stephen W. Hawking II,IV,IX

Remember A Brief History of Time? (1988) by Stephen Hawking when he was just 42 years old? I read this one for a high school physics class book report and concluded that this is actually a physics textbook supra-densely disguised as entertainment. The two sequels (Rama II and The Garden of the Rama) are much more into the people than the science and just don't work very well as fiction or science. There is also a new computer video game based on the Rama expedition, and there may be a movie in the works, too.
The backdrop to this story is the Manhattan Project, as we follow the main character, a Native American Army sergeant, who is also J. Robert Oppenheimer’s driver. Not only does this place us in the middle of the action, but he was living in New York City at the time, and all these people are going to go out to the rest of us. Stallon Game, location of the first atomic bomb test and nearly all the characters in this historical novel are real.

- **W. L. -** Walter / Whitely Strieber and James W. Kunetka

Not only does this place us in the middle of the action, but this story is written as if the two authors travel across America several years after a very limited nuclear war. Our culture is so dependent on high technology, yet few know how fragile these things are, and how vulnerable from both the scientific/technological and the sociological ends. (And if you have ever hated California, anyway...)

- **W. L. -** Nature’s End / Whitely Strieber and James W. Kunetka

Although I personally think that Woody Allen holds together better, this tale of what might happen to our ecosystem in our lifetime is too important to ignore. The scariest part is that the authors don’t really end the story; indeed they cop out and literally invoke “magic” as a solution, which only makes it MORE depressing!

**H W K L V -** The Andromeda Strain / Michael Crichton

The first major sci-fi book I ever read. Crichton’s gift as a writer is to blend fact and fiction so that you cannot tell if it’s true and what is story. (There really is a Jeremy Stone and all those other publications of his are real.) A secret satellite falls out of orbit and the entire population of the town of Piedmont, Arizona is mysteriously wiped out. Well, almost everyone. The sequel is a bit of a letdown, and was published before the movie was done, so the story is very different. The main characters are there: the early man-apes, the Monolith, our interrepid astronauts, and of course, HAL the computer. (Change each letter in HAL’s name to the next one in the alphabet to get the joke.) People who fall asleep in the movie find the book exciting, which is a good thing considering that this is a book report not a movie review.

- **W. L. -** The Hunt for Red October

Nothing worth doing once it wasn’t worth doing twice, according to the popular culture gurus who have created Sequalmania. Years after Clarke had finished 2001, he got the bug to go back and expand the story and to try to bring the science up to date. The result is 2010 and it’s a pretty good story – almost a violation of “Dr. Phil’s Rule of Sequels”. The movie is also excellent. Starring Roy Scheider (now seen as the Captain of the SeaQuest) and following these immortal twisted Russian aphorisms: “Easy as cake” and “It’s a piece of pie”, but once again, the movie and the book are different (and trust me on this one) Dr. Phil knows the difference.

- **W. L. -** Space / James Michener

A giant epic saga of the NASA and the American space effort to land Men on the Moon, told as only James Michener can do. Actually, like so many Michener books, it starts off so well and covers so much, that the final direction of this story seems to suffer from the usual sequel problem of a loss of innocence from the first, wonderful book. (Followed by a series of sequels, some of which are pretty good, but never recapture the innocence of this first one.)

- **W. L. -** Footfall / Larry Niven and Jerry Pournelle

Dinosaur extinction may have been caused by a collision with a comet or an asteroid. Recent research has revealed a 6000,000 pound rock passed within 50,000 miles of the Earth and astronauts didn’t even know it was there until three days after it passed! But what if dropping rocks on the Earth was the prelude to an invasion?

- **W. L. -** Inherit The Stars / James P. Hogan

When Prof. Strickland, former chair of the GVSU Physics Dept., first brought this S.F. book to my attention, my first thought was my usual evil thoughts to S.F. book cover artists who don’t have a clue when it comes to science. A mummy in a space suit on the Moon...? is much longer inventories and descriptions of things in the latter. There have been plenty of SF books about first contact with an alien race, but this one is nice because we are dealing with a real alien race and we can’t get to see the aliens (at least not in this book). There’s a lot of debate in the science applications of physics and there is a kind of pioneering spirit that permeates the drama. Followed by a series of sequels, some of which are pretty good, but never recapture the innocence of this first one.

- **W. L. -** The Two Faces of Tomorrow / James P. Hogan

In 1980, you probably ran into the network/MCI commercial with the strange English kid raving about digital data. The National Information Superhighway is coming. Internet is already here. MCI’s computers are heavily networked. At what point does an information network have so many computers and connections that it no longer is “just a tool”, but becomes self-aware? This is the problem faced in this SF story, where the government deliberately sets up a space station just in order to try to force the issue. The results don’t quite match the intentions, which is pretty much what you’d expect. We tend to direct our human emotions and attributes to computers, though any tendencies toward personality are strictly the result of programming. This story really discusses some of the stuff that computer science people have been burbling about for Artificial Intelligence (AI) years.

- **W. L. -** Congo / Michael Crichton

This is a classic science fiction novel of an alien desert ecology, combined with all the galactic drama and interstellar politics you could ever want. A generation of science fiction readers grew up blown away by this novel, which has achieved a stature almost like J.R.R. Tolkien’s Lord of the Rings trilogy, especially since Dune was followed by numerous sequels. (The sequels are best enjoyed by those fascinated by the politics; others might suffer from the usual sequel problem of a loss of innocence from the first, wonderful book.)

- **W. L. -** Ender’s Game / Orson Scott Card

Ender Wiggin is a young boy sent into space to train to fight an alien race that might require us to come back and battle again. In between some very interesting physics applications, Ender is subjected to the most unusual training and an secret agenda of his teachers. Card has a good track record writing science fiction about children and unusual coming-of-age stories. (His Songmaster is a beautiful story of music and galactic politics, of all things.) This is another perfectly wonderful science fiction book that has spawned a series of sequels, which are okay, but fail to capture the flavor of the first. I have debated putting this on the list for a long time, but recently a student suggested that I put this on the book list instead of the book he read which he hated.

- **W. L. -** Congo / Michael Crichton

One of the most popular books on the list, Congo is a nice muddle of science, technology and adventure in the deepest darkest and most mysterious parts of Africa. We tend to believe the rhetoric about the global village; in reality, there are vast stretches of the world (and our heritage) of which we know almost nothing. My favorite image is one of how they certify equipment as suitable for fieldwork. Congo was destined for even greater coverage during the summer of 1995 when the movie version came out, but... I doubt they could have filmed this a few years ago, but after Leonardo DiCaprio, they can do anything today — except write a decent script. As for the movie, Michael Crichton was not involved in this production, unlike many of his others. Look for considerable shifting of the characters, probably to modernize and make more politically correct. As a result, the movie is lame, read the book.
Time travel stories are always problematic - there is no good scientific basis for supposing that time travel will ever be achievable, but it makes for good stories. Crichton has once again turned his talent at technological misdirection to quantum physics and time travel. And also to the technologies of 14th century France. You'll probably learn more about the past than the future in this novel, but then you never know.

Airframe / Michael Crichton (1996)

It almost seems unnecessary to have to add another Crichton novel to the booklist, but then nothing entirely written by the author is actually suitable for this assignment. For example, Sphere and Assignment are fun books, but they will not appear in this list - and for good reasons. But Airframe works very hard to give the reader some insight into the personalities and motivations of the characters, and it fits into the new subgenre of corporate espionage. With Andromeda Strain, Disclosure and other Crichton stories, he has artificially collapsed the timeline so that there are unusual pressures on the protagonists, but that helps to move the story along. For W&U PHYS-102 students, this is a nice example of systems interactions at work; for W&M PHYS-107 students, you'll see all the physics principles that we've worked on all semester come into play here. A fast read, and maybe educational, too.

Grass / Sheri S. Tepper (1984)

Grass is a planet whose ecology is based on, well, grass. Hundreds of different kinds, colors, textures, flavors, etc. And the human colony also deals with the native animals in mimicry of an old style English fox hunt -- and this is where the mystery begins. I put it in this section, rather than under regular fiction, because, well, it's a strange book and I liked it. I know some people have had some weird reactions to it. (We own a copy because a friend of ours was too weirded out by it to keep it in her house!)

Time and Again / Jack Finney

Time travel has fascinated science fiction writers for a long time. Imagine going back and see what really happened. Jack Finney's What if story uses an ingenious concept for time travel: that we are trapped in our own time by all the little details of modern life that surround us. Live and breathe the details of another era, and you might find yourself back in New York City in the 1880's. Definitely one of the "Gee, I wish this was true" stories, I've included this on the list because it really highlights the technology of a century ago, which in turn puts a real perspective on where we are today. (There is a sequel, From Time to Time, that was written some twenty years later. As is typical of sequels, it doesn't have quite the innocence of the first book, but it is really enjoyable and has some really excellent twists in its plotline. I wouldn't recommend that you read the second without reading the first, though.) Run it again. Now let's see, the book I thought was the beginning of a massive series that is now four books long and I don't really think it's done yet.

World War in the Balance / Harry Turtledove (1994)

So here we are. The Americans and the Brits and the French and the Soviets, happily fighting the Nazis, the Italians, the Japanese -- and it seems to be all stuff that we've always known it was. But it all came close. The battle for Normandy was a real turning point, and it is a topic that is included in other booklist books (Footfall or just other unexpected alien encounters such as Where the Stars Bendlace). What the book is noted for is that it is written in the voice of the SS. His earlier work, The Guns of the South, postulates what would have happened if General Lee's Confederate Army had continued on to Washington D.C. -- and it is a topic that is included in other booklist books (Footfall or just other unexpected alien encounters such as Where the Stars Bendlace). Although the book suffers from a "I can't believe that they could do all this in two years" problem common to many SF stories, it is interesting to see how the story evolves as the nuclear threat and the implications of that become apparent. I don't really think it's done yet.

The Hammer and the Cross / Harry Harrison (1993)

Despite what you read about King Arthur, modern England really was established in 1066. But what if the Battle of Hastings had happened in 866? And the Vikings had won? This is the beginning of a series of books (One King's War, The King and the Cross and The King and Emperor) that explore the alternate history of a world where King Arthur never lived. The novel is set in the post-medieval era; there is a large amount of political intrigue, plot, and characterization. It is historically accurate, but with a large amount of imagination thrown in. The book is well written, and the characters are well developed. It is a very strong novel, and one that I would recommend for anyone interested in alternate histories.

Grass is a planet whose ecology is based on, well, grass. Hundreds of different kinds, colors, textures, flavors, etc. And the human colony also deals with the native animals in mimicry of an old style English fox hunt -- and this is where the mystery begins. I put it in this section, rather than under regular fiction, because, well, it's a strange book and I liked it. I know some people have had some weird reactions to it. (We own a copy because a friend of ours was too weirded out by it to keep it in her house!)
68. He is talking about the vision that became the Apple Macintosh computer. This book is about Bill Gates, the young, multi-billionaire chairman of software megafirm Microsoft. It is both a biography of the man and a history of the microcomputer revolution. Sometimes it is hard to remember that the IBM Personal Computer debuted in 1981 and even the venerable Apple computer only dates back to about 1977 or ’78. Lots of firms have come and gone, to say nothing of countless leading edge computers and programs, but Microsoft has been there from the beginning and despite the thousands of employees, Bill Gates’ vision is still the law in Redmond, WA. But this is no glass-eyed corporate P.R. piece; I think that it deals fairly with the brilliant and infamous reputations of both Chairman Bill and his company. As a result, methinks that Bill Gates will hate this book. By the way, Gates is now writing a column that the Detroit Free Press is running and you can send e-mail to him (or his minions) on computer issues at: askbill@microsoft.com.

69. There are so many complaints about the computer industry in this book. Having gone to school with computer nerds like me, the title alone is worth the price of admission. Bob Cringely turned this work into a three-part, two-and-a-half hour PBS special this year: Triumph of the Nerds: How the Personal Computer Changed the World.

70. Clifford Stoll's The Cuckoo's Egg contains many complaints that the FBI and other government agencies aren't involved enough in dealing with computer crime. Well, here we have the FBI storming in and breaking things up; the problem seems to be that (a) they are going after the wrong people and (b) they haven't a clue in understanding what all this computer technology is good for. (One agent wants to impound some audio CD's until another agent convinces him that you really can't do any computing with Michael Jackson music.)

71. Another New York Times best-seller, Kidder is just a good writer who tags along with a crowd of computer designers at Digital Equipment Corporation and their new computer: the first VAX. (The VAX's that WMU uses for student computer accounts have come a long way from that very first VAX-11/7500 of 1979, a machine I was very familiar with, that might be best described as looking like a high tech washer and dryer pair, with its associated disk drives.) You might want to check out the December 2000 issue of Wired magazine – they have an article about where Tom West, the Handy Boys and the Microkits (the people in this book) are today.

72. A fascinating tale of life on Internet, the international computer academic/educational/research network, that develops into a real spy story. Lots of explanations, but plenty of good technical stuff as Stoll does his detective work to find out who is breaking into his computers! (And those of the U.S. military.) Hope College, GVSU, WMU, KCC and most other colleges are connected to the Internet - in theory you could get a computer account and be a part of all this. PBS' Nova did an episode based on this story. Includes a great cookie recipe.

73. Since computers didn't exist in the 21st Century? The 21st Century? Us?

74. This is a book about how computers work, but it is not your usual sort of "how computers work" book. It is especially noteworthy not only because of the praise that reviewers are heaping on this title, but because the publisher is Microsoft Press. If you think that this is some Bill Gates promotional piece, though, you'd be quite wrong. Microsoft is first mentioned on page 102, and then only in a humorous comment that somebody people might think that "logic gates" were somehow named after The Billster. And Windows isn't even mentioned until page 334, just two pages after MS-DOS is mentioned. Who should read this book? I think everyone is eligible. Computer geeks and EE's may know some of this, but I dare say there is much more detail than they've ever seen. And it was my wife the librarian who pounced on this book at Schuler's Books & Music, not Dr. Phil. If sometimes looks intimidating, with diagrams and tables of numbers, but if you start at the beginning you will see that the author has laid out this story beautifully. And since Dr. Phil tells a storytelling approach to physics, you can imagine his delight with Code.


76. Richard Rhodes' The Making of the Atomic Bomb gets high praise earlier in the booklist. This book is not about Rhodes' writing, but the collecting of dozens of writings of others, written in a different time than ours. How realistic is a visionary – reflection is revealing. This would not be an easy paper. If you just start citing a list of topics or comments, you'll have missed the whole point. The goal of this book is to see the bigger picture. What is Rhodes trying to put together with this collection of items? What does it say about the 20th Century? The 21st Century? Us?


78. PC's are so commonplace today, that it is hard to imagine life without them. But not only was there a time (not all that long ago) that there weren't PC's or the Internet or Windows, someone had to figure out what the "idea" of the PC, the Internet or Windows, and someone had to figure out how we would use them. Bardini feels that Douglas Engelbart and the story of his Augmentation Research Center at the Stanford Research Institute has been neglected. We're not talking about bragging or patent rights here – we're talking again about that vision thing.

79. The Hacker Crackdown: Law and Disorder on the Electronic Frontier / Bruce Sterling

80. Sometimes estimates are more useful (or a better use of time) than calculating things exactly. This book is about the art of the "back of the envelope" calculation, like figuring out how many rabbits live in the desert based solely on the number of roadkills you pass. You may feel that there is more math in here than Harte lets on, but again, you should be able to skim the tough bits and still follow the threads of the arguments.

81. Accidental Empires: How the Boys of Silicon Valley Make Their Millions, Battle Foreign Competition, and Still Can't Get a Date / Robert X. Cringely

82. This is a book about how computers work, but it is not your usual sort of "how computers work" book. It is especially noteworthy not only because of the praise that reviewers are heaping on this title, but because the publisher is Microsoft Press. If you think that this is some Bill Gates promotional piece, though, you'd be quite wrong. Microsoft is first mentioned on page 102, and then only in a humorous comment that somebody people might think that "logic gates" were somehow named after The Billster. And Windows isn't even mentioned until page 334, just two pages after MS-DOS is mentioned. Who should read this book? I think everyone is eligible. Computer geeks and EE's may know some of this, but I dare say there is much more detail than they've ever seen. And it was my wife the librarian who pounced on this book at Schuler's Books & Music, not Dr. Phil. If sometimes looks intimidating, with diagrams and tables of numbers, but if you start at the beginning you will see that the author has laid out this story beautifully. And since Dr. Phil tells a storytelling approach to physics, you can imagine his delight with Code.

83. First it was illiteracy, then Cultural Illiteracy. Now the big topics in education are math illiteracy, science illiteracy and computer illiteracy. You don't have to be a mathematician to appreciate some of what this book talks about, and all of us probably can see ourselves in one of his examples. The author of several books on math and the public, John Allen Paulos also writes columns for several magazines and has a sequel to this book called Beyond Innumeracy.

84. High-Tech Heretic: Reflections of a Computer Contra / Clifford Stoll

85. This book is about the history of the Macintosh computer. This book refers to Steven Jobs' cheerleading term for the vision that became the Apple Macintosh computer. This book is about how computers work, but it is not your usual sort of "how computers work" book. It is especially noteworthy not only because of the praise that reviewers are heaping on this title, but because the publisher is Microsoft Press. If you think that this is some Bill Gates promotional piece, though, you'd be quite wrong. Microsoft is first mentioned on page 102, and then only in a humorous comment that somebody people might think that "logic gates" were somehow named after The Billster. And Windows isn't even mentioned until page 334, just two pages after MS-DOS is mentioned. Who should read this book? I think everyone is eligible. Computer geeks and EE's may know some of this, but I dare say there is much more detail than they've ever seen. And it was my wife the librarian who pounced on this book at Schuler's Books & Music, not Dr. Phil. If sometimes looks intimidating, with diagrams and tables of numbers, but if you start at the beginning you will see that the author has laid out this story beautifully. And since Dr. Phil tells a storytelling approach to physics, you can imagine his delight with Code.

86. Insanely Great: The Life and Time of Macintosh, the Computer That Changed Everything / Stephen Levy

87. The title refers to Steven Jobs' cheerleading term for the vision that became the Apple Macintosh computer. This book refers to the history of the Macintosh was written by a rabbi Malachick, so there are plenty of not very objective stories about the Mac and how awful everything else is, and he clearly doesn't know what he is talking about. Still, given the success of both the Macintosh and Microsoft Windows, it is very interesting to see where all this stuff comes from and how our ideas of what a computer is or should do have changed. It makes you really wonder about the people over at Xerox, who never exploited the tremendous stuff that was developed at their very own Palo Alto Research Center (Xerox PARC). (And in the 1940's, IBM once estimated that they could only envision a worldwide market for maybe ten computers.)
Every science generation has a sexy new topic or two that seems to solve every problem. Fractals were real big a few years ago, and now it is chaos theory. For most of us, it doesn't seem like chaos should control a lot of the problems in Nature, after all, our lives seem pretty much chaotic! But it has been really tough to scientists to accept chaos theory, because they grew up believing in the powerful Physics developed by Galileo, Newton, etc., which seemed to make the Universe run on clockwork and precise equations. On the other hand, if it works...

- **KLV** - Natural Acts: A Sidelong View of Science and Nature / David Quammen

Fun stories of biodiversity, science and scientists: water, cockroaches, The End of Life, The Beginning of Life, snorkeling in Montana and a man with a metal nose.

- **WKL** - The Dinosaur Heresies: New Theories Unlocking the Mystery of the Dinosaurs and Their Extinction / Robert T. Bakker

I've always liked Bob Bakker: he's animated and enthusiastic, has a big shaggy beard, always wears a hat and is not a thin person. Bakker, whose work was not only critical to making the move of Jurassic Park, but was sort of the prototype for Alan Grant and shows up in the video game version of Jurassic Park, is another of several dinosaur experts that have been upsetting the old ideas of dinosaurs as slow, plodding, cold blooded (literally and figuratively) reptiles. And since there are no dinosaurs today, everyone has got a theory on why they are extinct. Bakker was at WMU in the fall of 1995 and Battle Creek in 1994; If you ever have a chance to catch his "act", do so, especially if you kids. A very engaging and enthusiastic speaker.

- **WKL** - The Mis measure of Man / by Stephen Jay Gould

When I mention this book to other faculty, one of the names that comes up a lot is Stephen Jay Gould. I've heard Gould speak several times, at WMU last fall and also at Michigan Tech, and he is a very interesting person. There are certainly other options, but I thought that these two titles would complement the current reading list. With all the controversy in the fall of 1995 about the book The Blind Watchmaker, a certain amount of attention was brought to bear on the ideas of IQ and general intelligence (called "g") and how they are tested for. Gould tells a fair line in his award winning The Mis measure of Man of a decade ago, in recounting the history of intelligence testing and the desire to turn Psychology into a science like Physics, mostly trying to point out that these men were doing science as it was done in those days. The Blind Watchmaker authors, of course, fail to see this attempt at fair play, and Murray tries to show Gould's book and defending portrayal of general intelligence testing as inaccurate, which of course is what you would expect them to say.

- **WKL** - The Beaches Are Moving: The Drowning of America's Shoreline / Wallace Kaufman

If you are looking for a balanced view of the pros and cons of the atomic age - this ain't it. Dr. Caldicott became incensed with the numbers and horrors of atomic weapons and gave up a rewarding medical practice in order to combat them. In the 1960's, the Soviets actually only had four working missiles. (The CIA was really embarrassed when they found this out!) If you ever have a chance to catch his "act", do so, especially if you kids. A very engaging and enthusiastic speaker.

- **WKL** - Wonderful Life: the Burgess Shale and Nature of History / Stephen Jay Gould

This may be one of the shortest books in the booklist, but it is very long in depth and information. Rees takes a look at six astrophysical constants, numbers that essentially define our Universe and its suitability for us to live in it. In Physics class we tend to just simply accept our physical constants such as c, g, e, k, h, etc., without thinking about the consequences of these values. And although the Universe is H U G E, it can be very difficult to measure, perhaps as we are on one small planet orbiting a minor star in the midst of a terribly ordinary galaxy. So of the six numbers (H, U, g, e, k, d.), some are not well known, but all have meaning.

- **WKL** - A Beautiful Mind: The Life of Mathematical Genius and Nobel Laureate John Nash / Sylvia Nasar

Nothing engenders interest in a fine book like a compelling movie. And a hit movie about a high-end mathematician? Never happens. There is no question that "A Beautiful Mind", starring Russell Crowe and Jennifer Connelly, deserved the attention it received, but anyone reading the book will wonder once again how Hollywood managed to do it - create a completely different story and emphasis. However you cut it, though, the point remains that here is a man labeled as a genius, who worried mightily about "making a contribution" to his beloved mathematics, who disappears into a world of schizophrenia, only to reemerge by his own will to accept a much deserved Nobel Prize in Economics (there is no Nobel in mathematics).
Crichton’s Andromeda Strain also spins a yarn about scientists rushing to prevent the spread of a deadly organism. Summer of 1995; both have an exciting story of the spreading of a plague and the attempts to stop it. Michael Robin Cook’s novel Outbreak and a blockbuster movie of the same name (not by Robin Cook) were big news in the summer of 1995. There was a new Internet, before there was this thing called the Internet. The explosion of the Internet and the Web has been touted as something that would change the world. Technology is not a new invention of the 1990’s; a great deal of engineering design work was done long before computers were around. Good design involves many skills and quite a few mistakes along the way. Brittle fracture, the cooling of steel (the recipe for austenitic stainless steel is included; serves 4000), bridge collapses, etc. There are thousand year old structures that are still standing today while some pretty expensive modern real estate falls right down. Forget the lawyers and the lawsuits, these books look at the “why” of structural engineering, past and present. There is, by the way, another book entitled Why Buildings Stand Up (WKL). To Engineer is Human: The Role of Failure in Successful Design / Henry Petroski. This book offers a good introduction to the field of engineering. It covers some of the more common mistakes that engineers make. It’s not an easy read, but there are many interesting stories. The Hot Zone / Richard Preston. I,II,IV,V,VI

There are a number of great books about engineers and the projects they work on. For those who want a more technical treatment than Petroski’s To Engineer is Human, this book offers a good introduction to the field of engineering. It covers some of the more common mistakes that engineers make. It’s not an easy read, but there are many interesting stories. The Hot Zone / Richard Preston. I,II,IV,V,VI

A nice companion to The Victorian Internet earlier on the list, the laying of the telegraph cable connecting the New World with the Old World in the 1860’s was the “Victorian equivalent of the Apollo project”. Consider that before the cable was laid, the minimum communications time between the young United States and Europe measured in days or weeks. No way would American dollars get invested in the European stock markets with that kind of time lag, nor would Europeans invest heavily in American projects. Again, it’s a matter of perspective and paradigm shift. Today it’s wireless technology, and a general belief that “this is totally new” / “we’ve never been here before”. But realistically, that’s not true. Technical historians can still illuminate our present with the past. The Victorian Internet: The Remarkable Story of the Telegraph and the Nineteenth Century’s On-Line Pioneers / Tom Standage (1998) I,II,IV,V,VI

Promontory Point, Utah, May 10, 1869. A time and place that both defined a moment in history and changed the United States of America forever. The event was the laying of the Golden Spike to complete the joining of the Union Pacific Railroad from the Midwest with the Central Pacific Railroad from California. Reliable, fast communication and transportation from Atlantic to Pacific was now possible. Public interest in the completion of the railroad had been growing since the Civil War. We often think that everything was at a standstill during the great wars, but that isn’t exactly true. Business as usual went on in the West. The event in Promontory Point, Utah was seen as a celebration of progress, history and a spectacular construction project – one that would lead to the modern engineering feats of the 19th Century. Historian Ambrose is most recently noted for his work on WW II and the National D-Day Museum, work that Tom Hanks and Stephen Spielberg (Saving Private Ryan) have been trying to bring to the public eye. Thirty years ago I read Pierre Berton’s wonderful The National Dream about the construction of the Canadian Pacific Railroad, which is Canada’s transcontinental railroad story. Thankfully, in my lifetime, I have the pleasure of reading a similar epic about the American transcontinental railroad. The Terminal Map / Michael Crichton (1970) I,II,III,X

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portrayal of science and government in those fictional works. But what's the real scoop about how well are we prepared to face a super plague? Well, The Hot Zone is not fiction. It's about a real outbreak of a real disease in the United States. (It's the story of the Ebola virus disease--Virginia–Reston) and the efforts to identify and stop the spread. Although The Hot Zone apparently provided the inspiration for Outbreak, Preston claims that we are not nearly as well prepared as the fictional accounts I would have you believe. NOTE: the graphic (sensationalized?) descriptions of what hemorrhagic fevers do to the living are not for the squeamish.

For all the stories about the bubonic plague (Black Death) of the Middle Ages or AIDS and Ebola today, the most deadly world pandemic occurred right at the end of WW I, the 1918 Influenza Epidemic. Now everybody has gotten the flu. But your grandparents or great-grandparents probably never told you or your parents about the 1918 flu. Fear of the 1918 flu returning helped drive the Swine Flu Vaccine fiasco of 1976. Dr. Phil was a college freshman then, but because college campuses are a hotbed of diseases, I went ahead and got my shot, even though the shot itself was by then considered dangerous.

I heard Laurie Garrett talking about her new book on NPR in the Fall of 2000 and rushed out to buy it. Garrett is the author of The Coming Plague, listed above, and as a reporter for Newsday, she has circled the globe covering stories like Ebola, AIDS, etc. What struck me was her comments, which I had never really thought about before, that public health is not only not the same medicine, but that the two might be considered to be opposites -- maybe even enemies in the battle for funding and money. She makes an excellent case for the sorts of problems that exist now and will blow up in our faces in the near future because of our failure to think in terms of global public health. Lots of times it is easy to both feel for and feel angry at people dying of dread diseases in foreign lands like Africa and feel safe that such things will not affect us here at home in America. Be afraid... be very afraid...

The Human Genome Project has been described as the biological equivalent of the Manhattan Project in physics. Now for a lot of reasons, Dr. Phil doesn't believe that, but mapping out the entire genome of the human species holds great promise for the treatment and prevention of disease -- or it could hold the seeds of our destruction. Ridley, in part, tries to defuse the hype by pointing out that the HGP is not revealing the entire human genome, but rather noting some of the averages of the common man (whatever anyone chooses that to mean). His example is one of blood type -- which blood type will be the one included in the sample? However, there is no denying the scope of understanding where in all of our DNA strands that various traits are controlled. And in the Year 2050, two scientists at different institutions stumbled the science world by declaring the human genome "decoded", complete, in a time far shorter than originally forecast for the work. These two men even made A&E Biography's Biography of the Year. So chapter by chapter, Ridley talks in broad views of what is known about our own genetics and the sorts of puzzles, surprises and sheer scope that is included.

End of List
Don’t bother asking to read other Tom Clancy’s or Michael Crichton’s Disclosure, Sphere, Jurassic Park or Lost World (Jurassic Park 2). Dr. Phil will say “No”.

This Version of the List Contains 116 (or so) Titles Many of Which Are Listed In The Computer Catalogs At Area College and University Libraries (The Library Codes are Out-of-Date). Maybe, Just Maybe, You Might Want to Keep This Handy Book List for Future Reference?

All Books Have Been Carefully Chosen So If You Don’t See Any Science In A Particular Book Rather Than Saying “I Don’t See Any Science!” Why Not Ask Yourself: “Why Do You Think That Dr. Phil Put the Book On The List?” Be Sure You Read The Assignment Sheet Carefully Before You Write Your Paper See the Following Pages for More Information About the Format for Papers!

PLEASE! I Know That This Takes Time – I Know That Fitting In A Paper Is Hard Work
I Know That Printers Don’t and Word Processors Mangle, So Store Your Work on TWO Floppy Disks or a USB Memory Device If You Use a Computer. If You Use A “Real Typewriter” Rather Than a Computer, I Understand Your Problems.

So Don’t Use Your Paper As An Excuse To Cut Class That’s What the Grace Period is For – To Have Time to Fix The Glitch

We Want You HERE To Participate (And Get Your Work Done On Time, Too.)

New – An attempt to code the titles as an aid to keep you from making a bad mistake.

I, – Best-Seller
Many books are popular in their field, but a best-seller is defined as one that appeals to a much wider audience. Should be readable.

II, – Fact
This book is based on Fact.

III, – Fiction
Fiction is made-up. All Novels are fiction. Occasionally a book is based so much on a real incident, that I’ve coded at least one book as both Fact & Fiction.

IV, – History/Biography/Reminisce
The material in this book is based on actual events, which you could look up elsewhere, or use as a reference to some extent.

V, – Technology
The technology of 1999 is the technology of the 20th Century. This includes more than just the latest Intel Pentium III, chips at 650 MHz, but all sorts of stuff invented since the 20’s and 30’s. Understanding our technology is a major cornerstone in what Dr. Phil calls Science Literacy.

VI, – Non-1999 Technology
Most of us would not survive very well outside the 20th Century technological base. Studying the technologies of the Victorian or Edwardian engineers (19th & earliest 20th Century), or of metal work in the year 1000, or how one gets food to the table in a world without Saran Wrap™, microwaves or McNuggets™ is one window on today. A few books that study possible future technologies are also labeled with this code.

VII, – Fantasy/Absolute Worlds
Some people argue that all Science Fiction is just somebody’s fantasy, but technically Fantasy applies to stories that exist outside the realm of science – nearly anything with Magic, for example. Magic is often written in such a way that it becomes a science or a technology to its users in fantasy, and this is a good way to learn to study how and why we know science.

I’ve also included in this code, some books which have chosen to rewrite what history we know, again as a way to evaluate where we are today. These are What if…? books.

VIII, – Difficult to Evaluate
These books are minefields in some way. You can write a really lousy paper by not getting the point of the book and many people have. Most book reports on The Diamond Throne, a fantasy book, or Dune, an SF book, concentrate on the politics. Now if you are going to talk about the politics in Science Literacy, you’re going to have to be really good. Otherwise, its best to stick the mantra for this paper: Science, Engineering, Technology, Computers, Math and the Morality and Ethics of Using Same.

IX, – “Nutrient Dense”
Fancy way of saying long, hard book.

X, – Advisory for the Faint of Heart
Contains one or more of the following: adult situations, controversial materials or descriptions that are hard to handle. You have been warned!