Texts for Consultation
Modern Physics – Spring 2017

As you start to take more advanced Physics courses, it is quite likely you will want to go to sources beyond your textbook, instructor, and classmates to help you out. Getting help from the internet has become ubiquitous, but – as you probably are aware – using internet sources for help has its own dangers and pitfalls.

In an effort to help you find reliable sources for information, I am giving you this handout of other texts that may aid your learning experience. Although typing something into google is often easier than walking to the library, these sources have the advantage of being known, reliable resources.

Just as a reminder, your official recommended text for the course is:

Taylor, J.R., C.D. Zafiratos, and M.A. Dubson. *Modern Physics for Scientists and Engineers* (2nd Ed.) University Science Books.

This is the first time I have taught using this as the text. I am a fan of Taylor's Classical Mechanics book so, though I thought the book was a bit too elementary on my first read through it, I'm willing to give it a try. (I still haven't found a Modern book that I'm totally happy with, here's my latest attempt). The textbook is not required; I will not be assigning any homework out of the book or anything. That being said, it would be a good idea to have a modern text on your bookshelf, and this is the one I will probably be following most closely. If you feel like you need a text to help you as a student, go with this one.

Below, please find other resources you may find helpful. (This is, of course, only a partial list. There are many, many modern physics texts out there; I've just compiled this for your use/reference. There's probably some really good ones I don't know about yet.)

- Blanchard, C.H., C.R. Burnett, R.G. Stoner, and R.L. Weber (1969). *Introduction to Modern Physics* (2nd Ed.) Prentice-Hall. (An interesting text. This book gives a bit more introductory review of PHYS 111/112 content than most modern texts, but then talks immediately about atomic structure and electromagnetic radiation before moving into Quantum Mechanics. There is little (if any) special relativity discussed in this book.)

- Brown, T.B. (1940). *Foundations of Modern Physics.* Wiley. (Mostly a curiousity these days. It is interesting to go back and see what "Modern Physics" texts included only a couple decades after the discoveries in this class were made. This text in a way that today we would consider rather curious. Different topics are grouped together, and many of the chapters here are not something we would typically spend a lot of time studying today. Probably not an overly useful text to help you get through this class, but something that might be interesting to browse through for historical context).

- Eisberg, R.M. (1961). *Fundamentals of Modern Physics.* Wiley. (I love this text. It isn't quite as "gentle" as the other texts in this list, but the writing is – in my opinion – a mastery of clarity. I'm sure that I will be using this text fairly extensively when putting together your lectures. If you can get your hands on a copy, I'd highly recommend checking this out.)

- Eisberg, R.M. and R. Resnick (1985). *Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles.* Wiley. (This is a good introductory Quantum text. Since I've misplaced my own copy, I can't speak in particulars.)

- Feynman, R.P., R.B. Leighton, and M. Sands (1963). *The Feynman Lectures on Physics* (3 vols). Addison-Wesley. (If you aren't familiar with these books, you should be. Officially used as the basis for a first two-year Physics undergrad sequence at Cal-Tech, these are summaries of Richard Feynman's basic lectures and give an amazing conceptual treatment of most of introductory Physics. Some of the material is a bit dated, but still well worth your time. These books are sometimes called "The Feynman Red Books", because the most familiar edition has a red cover. Most – but not all – of the material relevant to modern physics is in volume 3.)

- French, A.P. (1968). *Special Relativity.* CRC Press. (A great introductory text devoted to Special Relativity. Pretty friendly, but not patronizing.)

- Harris, R. (2008). *Modern Physics* (2nd Ed.). Addison-Wesley. (I don't know much about this text. The reviews on-line are good, but many of them are written by Dr. Harris' own students. The organization of the book looks pretty standard. Might be a good resource.)

- Krane, K. (2012). *Modern Physics* (3rd Ed.) Wiley. (I used this text when I taught this class in Fall 2015. I quickly regretted it. It is an ok text I guess, but I really disliked it while I was teaching out of it.)

- Pauli, W. (1958). *Theory of Relativity*, Dover. (Not for the feint of heart. If you are bored by our treatment in class and know a *lot* more math than an average undergraduate Sophomore, check this out.)

- Rohlf, J.W. (1994). *Modern Physics from α to Z°*. Wiley. (An interesting text. The main reason that I didn't seriously consider it as the main text is that it uses a nonstandard list of topics and presents them in a nonstandard order. This doesn't mean that it won't work extremely well, but it won't work in parallel with our own structure as well as – say – the Taylor or the Tipler. I've also read that there are a number of typos in the text, but have not used it extensively myself to be able to say for sure.)

- Thornton, S.T. and A. Rex (2005). *Modern Physics for Scientists and Engineers*, (3rd Ed.) Brooks Cole. (I kind of like this book. It is arranged in a manner similar to the text we will be using this semester, and the explanations seem pretty clear. However, the treatment is a bit verbose in the subjects we plan to cover, so I opted not to go with it. If you don't like the Krane, this is one of the other places that may be worth looking at.)

- Tipler, P.A. and R.A. Llewellyn (2008). *Modern Physics*, (5th Ed.) Freeman. [Also 6th Edition]. (This is the text that we used for a few years in a row. Although I think it does a fine treatment of most of the material for the semester, the 6th edition has some rather key typos in the equations in the text, as well as the problems. Curiously enough, several of these typos do not exist in the 5th edition. Somehow, the text appears to have gotten worse. For basic principles, it is a good text. I'm not crazy with the super-emphasis on light curves but, in general, I still consider this a solid text.)

- White, H.E. (1940). *Classical and Modern Physics*, D. Van Nostrand Co. (See the entry under the Brown book. In particular, this may be interesting to astrophysicists since there is a chapter near the end on cutting-edge astrophysics as understood in 1940.)

It is also sometimes worth looking back to your PHYS 111/112 text to get another big-picture view of this stuff. Those introductory texts can be helpful more often than you might expect.