Texts for Consultation
Classical Mechanics – 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 required text for the course is:

Taylor, John R. (2005). *Classical Mechanics* University Science Books.

Having used this text to teach the course before, my basic comments are that this is a good, comprehensive textbook. It seems like his descriptions are clear. Having a few more examples in the text here and there wouldn't hurt, but by and large it is well written – far better than most of the other undergraduate texts on the topic that I've seen. He can be a little verbose here and there, but generally I really like the book.

Below, please find other resources you may find helpful. (This is, of course, only a partial list. There are many, many mechanics 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.)

- Corben, H.C. and P. Stehle (1977). *Classical Mechanics* (2nd Ed.) Dover. (This is the text I used in grad school – though most places use the Goldstein. It wasn't horrible, but I didn't find it particularly enlightening, either. It does give a bunch of extra information and treatments through sort of a differential geometry approach, if that sort of thing appeals to you. I still run to the first appendix of this book whenever I have to deal with Christoffel symbols).
- 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 CalTech, 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 Mechanics is in volume 1.)

- Fowles, G.R. and G.L. Cassiday (2004). *Analytical Mechanics* (7th Ed.) Brooks/Cole. (I used this text as an undergrad myself – though back then they were only on the fifth edition because I am an old man. At the time I didn't like it very much. It doesn't spend very much time on Lagrangian or Hamiltonian mechanics, but it is a reasonably commonly used text. I've actually bonded with other faculty members over how bad this text is; not necessarily recommended, but you never know – maybe it writes in a way that speaks to you.)

- French, A.P. (1971). *Newtonian Mechanics* MIT-Press. (One of those examples of a very clearly written but older textbook. The topics don't align completely with what we want to cover in this book, but if you're looking for a new insight, it may be worth checking out. By and large, the book is slightly less mathematically sophisticated than our treatment will be, but it is still a great resource).

- Goldstein, H., C.P. Poole, and J.L. Safko (2001). *Classical Mechanics* (3rd Ed.) Addison-Wesley. (This is the updated version of the standard graduate text used by most people. I'm not sure about the latter two authors – before looking it up for the bibliographic information, we always just called it "The Goldstein". Then again, my copy is from 1950.)

- Gregory, R.D. (2006). *Classical Mechanics* Cambridge University Press. (Don't know really anything about this book; came out after my student days. The table of contents looks good, however, and – when I poked around the internet a little bit – some people seem to think it is a pretty decent book. May be worth checking out.)

- Hand, L.N. and J.D. Finch (1998). *Analytical Mechanics* Cambridge University Press. (It seems like several pretty respected schools are using this text, but everything I've read suggests that perhaps places that adopt it eventually regret it. Might not be a bad place to go to get a different perspective, but not among the most universally liked on this list).

- Hasbun, J. (2008). *Classical Mechanics with MATLAB Applications* Jones and Bartlett Learning. (I know very little about this book; found it while doing an amazon search

for something else. I can't vouch for the writing at all, but I will say that the table of contents suggests a structure very similar to our own textbook. It may be worth picking up if you are more comfortable with a text that integrates computer programming more thoroughly than we will in our class here. That being said, I've never thumbed through a copy – it might be horrible.)

- Kibble, T.W. and F.H. Berkshire (2004). *Classical Mechanics* (5th Ed.) Imperial College Press (I don't know a whole lot about this text. I've heard it is rather abstract and the problems in it are hard, but there are those that swear by it. I think it is among the cheaper texts, so may be worth looking at.)

- Landau, L.D. and E.M. Lifshitz (1976). *Mechanics* (3rd Ed.) Butterworth-Heinemann. (For those of you who aren't aware, Russian Physics Nobel Prize Winner Lev Landau and his student Evgeny Lifshitz wrote a 10-volume series of texts that essentially span the basics of Physics at the graduate level (at least Physics as understood by about 1950). These are beautifully written (though dense and challenging) texts. Some of the Landau/Lifshitz texts are still sometimes used as textbooks in graduate school to this day – including, fairly often, the Mechanics book.)

- Morin, D. (2007). *Introduction to Classical Mechanics* Cambridge University Press. (See the Gregory.)

- Symon, K. (1971). *Mechanics* (3rd Ed.) Addison-Wesley. (Book that's a bit on the older side, but approximately at the same level as your textbook. You'll find that Taylor is a bit verbose on a bunch of stuff. If you want a more concise/less chatty version, this might not be a bad resource to go to. It actually is pretty friendly.)

- Thornton, S.T. and J.B. Marion (2008). *Classical Dynamics of Particles and Systems* (5th Ed.) Brooks/Cole. (I very nearly chose this book. It is another one of the good intermediate undergraduate texts. Worth looking at from time to time if you can get a chance. For some reason I don't understand, I usually refer to this as "Marion and Thornton" instead of "Thornton and Marion").

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.