**Suggested Reading List for 1210 (in parenthesis extra reading for 1310):**

Each reading should be done before going to the respective lecture during which we will work through the related material.

If you have trouble understanding any of the equations, figures, or examples make sure you ask during my office hours, ask TAs, or go to Physics at Night.

Math prep

Vector Addition in chapter 1.7

Components of Vectors, chapter 1.8

*(key operations: figure 1.18 and 1.21, eqn 1.6, 1.7, 1.8, 1.10)*

Work through example 1.7

Chapter 2

*Average vs instantaneous properties*

Work through example 2.1 and figure 2.7 and 2.8

*Acceleration*

Study figure 2.13, 2.14 and make sure you understand each and every vector (direction and magnitude!)

*Master Equation*

Equation 2.12 is what is called Master Equation 1 in lecture.

Read in chapter 2.4 how to arrive at equation 2.8 and how to transform eqn 2.8 into 2.12 and 2.13

Work through example 2.5

*Free Fall, chapter 2.5*

Work through example 2.7. Make sure you understand the final graphs in figure 2.25.

Chapter 3

*Motion in two dimensions*

Study figure 3.2, 3.3 and work through example 3.2

*Independent vector components*

Work through example 3.3 and the ‘test your understanding’ box at the end of chapter 3.2

Check the answer at the end of chapter 3. If your answer was wrong, read example 3.4.

*Projectile Motion*

Study all vectors in figure 3.17. Make sure that you can explain each vector’s direction and relative magnitude.

Study equation 3.20, 3.21, 3.22, 3.23. Make sure you are certain why ‘g’ shows up in only two of the equations.

Work example 3.7. (3.8, 3.9)

*Relative Velocity*

Study example 3.14 and 3.15. Make sure that you understand, why in the one example sin is being used and tan in the other.

Chapter 4

*Force and Mass*

Read the introduction of chapter 4.1 and the parts of chapter 4.2 pertaining to mass and inertia and inertial frame of reference, ignoring the math.

*Newton’s Laws*

Work through the sub-chapter ‘Superposition of Force’ in chapter 4.1.

Work example 4.1.

Study equations 4.3, 4.4, 4.5, 4.6, 4.7, 4.8. Make sure you understand fully that they do all pertain to the same phenomenon: A number of forces are acting on a body. The only difference between Newton 1 and Newton 2 is that the sum of forces is zero or not zero. Make sure you are comfortable with what we mean by ‘net force’.

Work example 4.5.

Read chapter 4.5 without the examples. Make sure you understand that the difference between Newton 3 and the other two Newton laws is that Newton 3 describes the forces between two bodies and the other two laws describe the forces acting on just one body.

Work through example 4.9 and 4.10. (4.11)

Work through example 5.3 and 5.4. Make sure you understand why the angle  from the incline appears in the free body diagram in the way it does.

Work example 5.8. (5.9)

Work example 5.12.

Study figure 5.17 and read in the adjacent text what is meant by ‘friction’.

Work example 5.15.(5.17)

Chapter 6

*Work*

The concept of energy is difficult. We need another new concept, work, for making energy accessible. There will be three ways to determine work and that can give cause for confusion, if you are not very sure about the first work concept introduced.

Study figure 6.3 and equation 6.2, 6.3 and then figure 6.4.

Work through the sub-chapter ‘Scalar Product’ in chapter 1.10 and example 1.11.

Work through chapter 6.2 and make sure you understand how one arrives at equation 6.5.

Read problem-solving strategy 6.1 together with equation 6.6 and figure 6.10.

Use what you have learned to work example 6.3 and 6.4. Make sure to understand how the two different ways to find work done give complementary information in the examples and how sometimes only one of them allows us to solve a problem.

Read chapter 6.4 and example 6.11.

After I will have introduced integration in lecture, go back to chapter 6.3 and work through it step by step.

**Energy and Momentum**

(example 7.2 and 7.9)

Chapter 8.1, 8.3 and 8.4 with the following examples: 8.3, 8.4, 8.6, 8.9, 8.12

**Rotational motion**

Figure 9.5 and 9.7 and chapter 9.2

*Make sure you understand what a radians is and when to use it in a sine function as input as opposed to when to use degrees*

Example 9.2 to see how the new equations work the same way as the old linear kinematic one’s

Chapter 9.3 without examples.

Moment of inertia: example 9.12 and 9.13

*Make sure you understand how an integral of a power function is calculated and how to determine which limits to put on an integral*

Example 9.8 and 9.9 *make sure you understand the ‘identify’, ‘setup’, and ‘evaluate sections*

Study the definition of torque in chapter 10.1, study figures 10.2, 10.3, 10.4

Compare the cross product use here to the definition on pages 24-26.

Examples 10.2, 10.3 – I will demonstrate these in lecture too; make sure you read them *before* I demonstrate the problems; that may make all the difference in understanding the problems

Example 10.5 *make sure you understand why objects of the same mass and radius roll with different velocity down an incline; think about what difference a change in mass or radius would have on the result, ie compare, for example, two cylinders of different mass and/or two spheres of different radius.*

Chapters 10.5 and 10.6 with figures 10.23, 10.24, 10.26 and examples 10.11 and 10.12/

**Gravitation**

Chapter 12.1 without examples but with figure 12.1

Then example 12.3

*Make sure you understand what ‘superposition’ means.*

Figure 12.8 and 12.11

Example 12.5

Chapter 12.4 with example 12.6

**Periodic Motion**

Chapters 13.1 and 13.2 with all figures

*Make sure you understand the difference between period, frequency, and angular frequency; don’t confuse angular frequency and angular velocity*

*Make sure you understand how a sinusoidal motion can be mapped onto a circular path*

Study figures 13.10, 13.11, 13.12 *make sure you understand how one goes back and forth between displacement, velocity, and acceleration using either graphical or mathematical methods*

Chapter 13.3 with figure 13.15

Chapter 13.15with figure 13.21