

# PHYSICS 151 READING ASSIGNMENT

## FOR JUNE 24

### SECTIONS 5.2 TO 5.4

Please notice that this file is two pages long.

#### 5.2 - Dynamics and Newton's Second Law

- The most important thing to realize when applying Newton's Second Law is that acceleration is *NOT* a force. In other words, there are no new forces acting on an object when it accelerates. The forces we identify for an accelerating object are the same that we would identify on a stationary object. The only thing that changes are the magnitudes and sometimes the direction of forces.
- It is also very important to remember to add the components of the forces:  $\sum F_x = ma_x$  and  $\sum F_y = ma_y$ !

#### 5.3 - Mass and Weight

- The first part of this section is review for us since we've already gone over in class that  $w = mg$ . Hopefully the book's discussion will cement this fact and help it make sense.
- Apparent Weight - I prefer to think of the apparent weight as the normal force instead of a spring force. The concepts, however, are the same.
- Weightlessness - People experience weightlessness when their apparent weight is zero. You can experience weightlessness on earth.

#### 5.4 Normal Forces

- We've discussed in lecture many times how the normal force is perpendicular to the surface.

- This section introduces the incline problem. The most convenient axes in this case are parallel and perpendicular to the surface. This causes us to use a non-standard angle. Notice how the component of weight along what they call the  $x$ -axis uses  $\sin \theta$  while what they call the  $y$ -axis uses  $\cos \theta$ . To help students, I usually call these axes parallel ( $\parallel$ ) and perpendicular ( $\perp$ ).