__Study Guide__

__AP Physics C__   __Mr. Butler__

__Applications of Newton's Laws__

__The student should know or be able to do the following:__

1. **Apply Newton's 1st law correctly in situations involving conditions of static and dynamic equilibrium to determine one or more physical quantities.**

2. **Draw a correct and complete free-body diagram for an object including coordinate axis, force vectors w/labels in their correct orientation direction, and resolved forces in their correct orientation direction.**

3. **Draw correct and complete free-body diagrams for objects on an incline and for situations involving a system of objects.**

4. **Apply Newton's 2nd law correctly in situations involving dynamics of an object or a system of objects to determine one or more physical quantities.**

5. **Distinguish between *static, kinetic*, and *rolling* friction and their coefficients and be able to apply the correct frictional force and coefficient in a given situation.**

6. **Correctly interpret and apply the information given in the F_f vs F_a graph for impending-relative motion.**

7. **Distinguish between *fluid resistance* and *drag*, know what factors these depend on, and use calculus methods to determine the *terminal velocity, drag coefficient* or the magnitudes of forces involved in drag force problems.**

8. **Correctly interpret and apply the information given in the graphs of acceleration, velocity, and position for an object falling with fluid resistance.**

9. **Describe the relationship between *terminal velocity* and fluid resistance and be able to correctly apply the derived functional equations to determine the vertical position, velocity, and acceleration at any time *t* for an object falling through a fluid*.***

10. **Identify the features of centripetal force and centripetal acceleration for an object moving in horizontal or vertical circular motion, identify the source of centripetal force and correctly apply a FBD and Newton's 2nd law to solve problems involving the dynamics of circular motion.**

11. **Use the principles of dynamics of circular motion to interpret and solve problems involving motion on banked and unbanked curves.**

12. **Distinguish between *centrifugal* force and *centripetal* force and relate these forces to the dynamics of circular motion to describe why Newton's 1st and 2nd laws do not hold in a rotating non-inertial reference frame.**

__NOTE: Review diagrams, graphs, worksheets, applets/films and handout materials.__