INSTRUCTIONS FOR DOING YOUR HOMEWORK (Version 1)
Vlasios Vasileiou (Vlasisva@umd.edu) 09/22/2003

MAJOR:
1. **Staple** your papers together.

2. **Box your final answers** and **separate** your problems by leaving 1-2 lines space.

3. **Turn in neat homework:**
   a. Each step should be at the bottom of the other. **No zigzagging.**
   b. Don’t skip parts of calculations. Ex.
      \[
      \frac{dx}{dt} = 5 \iff dx = 5dt \iff \int dx = \int 5dt \iff x = 5t + x_0
      \]
      is better than
      \[
      \frac{dx}{dt} = 5 \iff x = 5t + x_0
      \]
   c. Always try to “name” your equations that you will use again in your solution Ex.
      \[
      X = U_0 \cdot \cos(p/2) \quad (1)
      \]
      from (5) we find that t=50sec
      so \( (1 \times 5) \rightarrow X = 50 \cdot U_0 \cos(p/2) \)
   d. Explicitly clarify **WHAT** you are trying to find at each major step of your solution (at the key points) **and HOW** you are going to find that. Ex. “We will find the maximum height of the electron by solving eq (1) for Uy and then by substituting Uy=0.”
      The algebra and calculations will be **below** the explanation.
   f. Either use a sharpened pencil and eraser or a pen (I prefer pen) and correction fluid. **Try not to make many smudges** and particularly in the middle of equations! If there are large parts of an exercise that need to be removed, you can just cross them out.

4. **ALWAYS write out your solutions in algebraic form BEFORE** you substitute in numerical values.

5. **ALWAYS write the appropriate units after your solutions.** In order to check whether a solution is correct, you may substitute the **units** along the numerical values in the algebraic form. Then by doing the calculations with units, your final result should have the appropriate unit. Else, you have made a mistake! Simple Example:
   \[
   \begin{aligned}
   F &= m \cdot a = 5Kg \cdot 10(m/sec^2) \cdot \hat{i} = 50(Kg \cdot m/sec^2) \cdot \hat{i}
   \end{aligned}
   \]
This can be applied to more complex equations where units can be cancelled out, like at the nominator and denominator of a fraction.

6. **Draw a picture for every problem** (where appropriate), defining your coordinate system, your unit vectors along each coordinate axis (\( \hat{i}, \hat{j}, \hat{k} \) for Cartesian, etc.), the vectors of forces (where needed) and all of the angles you may use.

7. **Consider whether your answers make “sense”** by checking units, sign etc. (Ex. Negative time in kg can cost you most (if not all) of the points of an exercise!)

**MINOR:**

1. Try to use vectors. It is more appropriate to say \( \vec{F} = m \cdot \vec{a} = 5 \left( \frac{kg \cdot m}{sec^2} \right) \hat{i} \) instead of saying that \( \vec{F} = 5 \left( \frac{kg \cdot m}{sec^2} \right) \) upwards. If you calculate the length of a vector (ex. the value of speed), you should always write your final result in vector form, thus defining the direction. Ex.

\[
U_x = \frac{ds}{dt} = \frac{500}{25} \text{sec} = 20 \text{m/sec}
\]

so \( \vec{U_x} = 20 (m/\text{sec}) \cdot \hat{i} \)

2. Try to use vectors correctly. \( F = m \cdot a \) is wrong because LHS is a vector and RHS is a scalar. So try to use only scalars (i.e. the lengths of your vectors) or only vectors in an equation.

**Comments:**

1. I won’t subtract points for numerical mistakes in your calculations. However if your final result doesn’t make sense, I will subtract points for that. Also, if you make a lot of mistakes in calculations I will eventually subtract some points.

2. Try to send me an email (vlasisva@umd.edu) before coming for questions to my office. That way we can arrange for a meeting outside my office hours (if you want) and I will probably answer your questions in a better and faster way.

3. This long list of instructions will be revised in the future. So keep checking. (There is a version number on the top).