

## Homework Structure

A problem solution is a form of technical communication and should therefore be very clear and easy to understand. The computer is a tool and should only be used after the problem has been clearly defined and the basic governing principles applied. For this reason, you are required to follow the same homework structure used in ES201. A detailed description of the homework format can be found in Appendix A of the notes passed out in ES201. A brief summary is given below.

### Requirements:

- Use standard size (8.5 x 11 inch) engineering paper.
- Write on one side only.
- Start each problem on a new page.
- Emphasize your final answer by double underlining it or by boxing it in. Include appropriate units.
- If you use a computer algebra program in your solution be sure to include a copy of the file, but present the final answer on the engineering paper.
- Staple the pages of each homework set together and include a cover page with your name, course name, course number, and each problem number that is included in the homework set. See sample homework cover sheet.

### Structure - every problem should have the following sections

1. Known
  2. Find
  3. Given
  4. Analysis
  5. Comments
- See Appendix A of the notes passed out in ES201

### Comments on the Analysis section

- Be sure to identify the system or systems you will be analyzing. For many problems this process will also involve drawing a free body diagram and a resultant force diagram (kinetic diagram) with a coordinate system clearly labeled. Please note that problems may require more than one system.
- As you proceed through your solution process insert descriptive comments as to what you are doing.
- Include a Unknowns/Equations Table if appropriate. Make a list of the unknowns and the number of independent equations to help determine when you have enough equations to solve for the unknowns.
- Be sure to state in words what principle you are using or if you're using a kinematic or constraint relationship. Be sure to number the resulting equations and update the Unknowns/Equations table every time a new unknown or independent equation is obtained. Simple algebra should be done during this process.
- Do the number of unknowns equal the number of equations?  
Once the number of unknowns equals the number of equations you should be able to solve for the unknowns. If you have more unknowns than equations identify an additional system if there is one or identify additional equations (often these come from kinematics or constraints).

- Solution of Equations and Final Answer  
Solve the resulting equations either by hand or using a computer algebra system (whichever is easiest for the particular problem being solved) and clearly indicate the answer. Include a computer printout if appropriate. If the solution of the equations fails to give a reasonable answer there is probably a problem in the equations, for example they may not all be independent.
- Check your answer  
Your solution should be checked to make sure it is reasonable. Ask yourself, "Does the answer make sense?" If computer algebra is used double check your answer by substituting back into the governing equations.

### Everybody is getting an A!

A large part of this course is concerned with problem solving and applying conservation principles to a variety of situations. For this reason, mastery of the homework is essential for the successful completion of this course. Please note the following about the homework.

- The homework assignments will be collected at the beginning of the class period on the days indicated in the course outline.
- The homework should be written up according to the instructions contained in the "Homework Structure" page of the administrative handout. Points will be taken off if this format is not followed.
- If you use Maple, you *must* include the output of your Maple session to support your solution. A 20% penalty will be assessed on each problem that references Maple but does not include output.
- Late homework will not be accepted except for medical reasons or the student has received prior approval from me.

#### Keys to Success

- Do the homework daily! This requires discipline since the homework is not due every day. I refuse to treat you like high school students and have the homework due daily.
- Get help from one or both of the following sources
  1. Your classmates (but do not copy). Working with other students in this class is not only allowed, it is encouraged. The only condition I place on working with others is that you acknowledge the help (see below). Working in a group on the homework can be an excellent way to learn the material. It is important to note that every student will be individually accountable for the material via the exams. Do not "divide up the problems", but help each other when you get stuck.
  2. Me. I have open office hours and am always willing to help. If you have difficulty finding me in my office see me after class and we will arrange a time to meet.

Sample homework cover sheet

I.M. Studios

Box 9999

Mechanical Systems

ES204 Section D

HW Set #1

Due Date: March 9, 2001

11.127 \_\_\_\_\_

12.27 \_\_\_\_\_

12.28 \_\_\_\_\_

12.34 \_\_\_\_\_

**Honor Statement**

On this page an honor statement should be written by hand. This statement should be one of the following:

1. I pledge my honor that I did not copy any of this homework, but I did receive help from (the name of the students should go here).

(your signature)

or

2. I pledge my honor that I did not copy any of this homework and this work is entirely my own.

(your signature)

*Homework not having a signed honor statement will be subject to a 50% penalty!*