APM 153: Introduction to Computing Methods for Engineers and Physical Scientists
Homework

The purpose of the homework is to give you practice on problems at a variety of levels. Homework should not be viewed as something to just get done, but rather to assess your mastery of material. If you are struggling with the homework, the exams will not be any easier. The homework assigned to be handed in is the absolute minimum practice that you should be doing to master the course material. Mastery of the material in this course will help you in subsequent courses, in the exams, and in your careers. If you struggle with the homework, you are not prepared for the future.

Note carefully, the following regarding the homework:

- It is possible to do the homework completely correct and receive a score of 30%. **Neatness counts!**

- Expectations increase with the complexity of the assignment. Assignments later in the semester may be graded with higher expectations than those earlier in the semester.

Solutions Guidelines: All homeworks are expected to conform to the following guidelines. Note carefully the maximum communication score for non-conforming homeworks is 4.

1. Use white $8\frac{1}{2} \times 11$ or A4 paper with no rough edges (trim paper torn from spiral notebooks).

2. Use either pen or pencil or a computer-generated solution.

3. Use color for emphasis as necessary.

4. Staple pages in the upper, left hand corner.

5. Place your name on the top sheet and initials on all subsequent sheets.

6. For electronic submission of documents (if permitted):

   (a) Format pages to print on $8\frac{1}{2} \times 11$ or A4 paper.

   (b) Acceptable document formats include: MS-Word (.doc), LaTeX(.tex), Portable Document Format (.pdf), PostScript (.ps). No other formats will be accepted (in particular .jpg).

7. For electronic submission of calculation documents:

   (a) Format pages to print on $8\frac{1}{2} \times 11$ or A4 paper (if applicable).

   (b) Provide documentation in other appropriate formats if not provided internally.

   (c) Acceptable calculation formats include: MS-Excel (.xls), Mathcad (.mcd), MatLab (.m), or other as announced in class.

8. Use the following format for the filename:

   (a) `HWSet01-yourlastname-yourfirstname.ext`

   (b) Please use your name as listed on your student records.

   (c) Incorrectly named files may result in a grade of 0 if the assignments are machine-graded.

Homework Grading: The grading of homeworks will use the following rubric. For each assignment, scores will be given for a number of different aspects of the assignment. One aspect is presentation of the homework, so neatness does indeed count. The total grade on the homework will be a composite of the aspects given below with the weightings as indicated. Each assignment will be worth a total of 40 points. As indicated in the rubric below, extra credit is possible in a number of factors: Extra credit possibilities are indicated in parentheses.

   The final homework grade will be a combination of the scores from the technical rubric and the communication rubric. The final grade, G will be:

$$G = \frac{\sum_i w_i R_{Ti}}{\frac{G_C(R_{Ci})}{100}}$$

where
$R =$ rubric classification
$i =$ technical rubric category
$T =$ technical score
$C =$ communication score
$G =$ 100-point scale grade (from grade equivalent table below)
$w =$ technical score weighting

Grade Equivalents

Rubric Score	Letter Grade	100-point Scale
5	A	100
4	B	90
3	C	80
2	D	70
1	F	30
0	F	0

Technical Rubric Scores

Algorithm Development (weighted ×2)	
(7)	The algorithm is developed beyond the stated problem
5	Algorithm is clear, structured, and appropriate. The algorithm addresses the problem specified. All process steps are included in the algorithm. Pseudocode, flowcharts, and/or descriptions follow standard conventions.
3	Algorithm attempts to address the problem but is not clear or is incomplete. Pseudocode and/or flowcharts do not follow standard conventions. Process is missing steps. Algorithm is not deterministic.
1	The algorithm does not address the problem specified. Proper conventions of algorithm development were not followed.
0	No work provided.

Implementation (weighted ×1)	
(7)	The implementation is capable of handling exceptions (improper inputs, etc.)
5	The solution is coded correctly and completely. When operated, the solution runs to completion. The implementation matches the submitted algorithm.
3	The implementation contains errors in logic. While no syntax errors prevent it from running, errors in logic prevent it from finishing the task. The implementation does not match the submitted algorithm completely.
1	The implementation contains errors in syntax. Code error messages prevent the solution from running to completion. There is no correlation between the implementation and the submitted algorithm.
0	No work provided.

External Documentation (weighted ×1)	
5	The external documentation is clear and concise in the operation of the program/solution. The program can be run as indicated. The limitations of the program are clear. The syntax of using the software is described completely.
3	The external documentation does not clearly indicate how the program should be run. The user needs to try several ways to start/use the program.
1	The user must investigate the program by looking at the code to determine how to run/operate the program. It is not clear how to operate the program.
0	No work provided.

Internal Documentation (weighted ×1)	
5	The program is completely internally documented including header material, proper variable names, variable definitions, proper alignment, and proper comments within the code.
3	The may not include all of the proper internal documentation including one or more of the following: header material, proper variable names, variable definitions, proper alignment, and proper comments within the code.
1	Limited or no internal documentation. The user must depend on the code to determine what the program is doing.
0	No work provided.

Problem Solution (weighted ×1)	
5	The program produces correct answers for all trials.
3	The program produces some correct answers.
1	All answers produced by the program are incorrect.
0	No work provided.

Discussion (weighted ×2)	
(7)	The discussion takes the assignment beyond the stated objectives.
5	The discussion is complete and correct. All the questions are addressed completely.
3	The discussion does not address the questions asked.
1	No discussion is present or the discussion is inappropriate.
0	No work provided.

Communication Rubric Scores

	Communication
5	The reason for each calculation step is clear. The overall solution follows logically with no false side tracks. Extraneous information is minimized. Given data, reference data, and calculated values are clearly discernible
4	The solution is neatly presented with no erasures and crossouts. The solution is easily followed. The solution conforms to the guidelines for homework solutions
3	The final solution is easily discernible. The overall logic of the solution is clear, but may contain side tracks or false starts. There is evidence of some editing and selection of presentation
2	The solution contains many erasures and crossouts. The handed in solution appears to be a draft or scratch calculations. There is evidence of false starts and side tracks
1	The solution logic is not evident. Given data, reference data, and calculated values are not discernible. No diagram (if appropriate)
0	No legible work provided.