General Exercise Instructions

Schedule:  
Exercise 1 due Friday of Week 4  
Exercise 2 due Friday of Week 6  
Exercise 3 due Friday of Week 10

1. Select a topic area.  If it is one of those suggested in one of the specific exercise writeups, read the paragraph provided (see links to specific instructions for Exercises 1 to 4 at the end of this web page).
2. Build a basic model as indicated, and get it working to model the situation "as is."
3. Then, when [or perhaps, if] you get a basic model working, devise improvments or corrective actions and modify your model [as time permits] in order to "control" the situation and reduce or eliminate undesireable behavior such as wild oscillations.   You want the system [model] to return to stability in a reasonable time after you introduce a disturbance. For example, if you choose the Tree Planting/Harvest model, make sure the target level of mature trees is returned to after the harvest rate has been either increased or decreased. If you choose the Rookie-Pro model stabilize the system so the workforce does not go through boom and bust cycles (too few people during one time period, and too many another).
4. If you do not have real parameter values (such as the Methane production rate of a 100 acre landfill, or how much nutrient a bacterium eats per unit time), use a factor that you estimate to be plausible. Often, a valid model can be developed even in the absence of an accurate piece of data. DOCUMENT that you used a potentially bogus factor (and why) and discuss in your write-up what the potential problems are with it. "Fudge" factors are OK for a learning exercise, as long as we are up front with them and we explain the rationale for them.
5. Write up your results and conclusions.  A sample write-up may be viewed [here](https://d2l.pdx.edu/content/enforced/676153-OFFERING_SYSC-514-001_201801/exsample.htm?ou=676153).   Additional examples are available from the instructor (in the form of a notebook).
   * To document models and results
     + I use <printscreen> to put pictures of screens onto the clipboard
     + then I open Microsoft Paint and use edit/paste to insert the picture
     + I select the part that I want, and then edit/copy to put the cropped image onto the clipboardl
     + then edit/paste in Word or Frontpage
6. To the degree that it fits, you might want to use the following template as a general outline for exercise writeups (but this is a guideline only):
   * State, in general terms, what you expect to learn from the assignment.

* Document:
  + the steps you took to do this assignment
  + why you chose that approach
  + what happened
  + why you think it happened
  + If incorrect or unexpected results occur, what did you do to correct the model or verify the results
  + if you make multiple iterations to develop a model, document the first iteration and the final model only unless something particularly interesting occurs during one of the intermediate iterations.
  + State your conclusions (or interpretation or reaction ) about what happened in your homework experiment.
  + State what you learned from the assignment. Did you learn what you set out to learn? If not, how did your learning differ?  I want to get an overall  sense of your learning experience.
  + Indicate how the model might be improved? Explain both what steps you would take and why you would take each step.
  + Try to use an appropriate balance of overview and detail.
  + Provide the following attachments to your write-up:

1. a diagram of the model - annotated to highlight what is interesting or unusual, as appropriate
2. the model equations - consider using STELLA's "document" feature to clarify the equations
3. graphs of model behavior - annotated to highlight what is interesting to you

Links to Specific Instructions for [Exercise 1](https://d2l.pdx.edu/content/enforced/676153-OFFERING_SYSC-514-001_201801/Exercise1.htm?ou=676153)| [Exercise 2](https://d2l.pdx.edu/content/enforced/676153-OFFERING_SYSC-514-001_201801/exercise2.htm?ou=676153) | [Exercise 3](https://d2l.pdx.edu/content/enforced/676153-OFFERING_SYSC-514-001_201801/Exercise3.htm?ou=676153)

Additional Notes:

1. Collaboration is encouraged, but each student is expected to hand in an independent write-up of their personal learning experience.
2. If you find you have to abandon an approach, write up what you did and why the approach was not valid, then go on to the new approach. As much learning can come of a false start as a successful, and we want to capture that learning.
3. TIME LIMIT - it is the instructors intent that you should not need to spend more than approximately a half an hour per point  on an exercise in order to earn a B+ (computer problems notwithstanding, and provided that the write-up of your learning experience is adequate).  It may (or may not) take more time to earn an A.If you get "stuck," ask for help rather than banging your head against the wall!

Comments regarding what influences grades:

* **Pluses**: clarity/completeness of writeup; organized approach; sensitivity analysis; much experimentation;
* controlled experiment to verify performance; good discussion of expectations, reflection, learning, conclusions, potential improvments; clear assumptions; very clear expl. of constants; degree of ambition/initiative; model completeness/correctness
  + Examples of initiative include: plotting family of curves, non-linear pendulum, impact of rookies on pro efficiency, pre-planning strategies for over-planning to enable larger harvest, effect of saplings dying,  initial saplings vs. add saplings
  + Pluses for Exercise2 esp.: excellent writeup/narrative, adding "controls," summarized "4 lessons," degree of ambition/model extensions, brought in model & hypotheses from the literature
* **Minuses**: feedback not clear; limited sense of learning; overly brief writeup; scaling concerns (blowups); no original change; unclear or bad names; overly complex
  + Minuses for Ex.2 esp.: dt issues/concerns, not enough testing to warrant high confidence, mysterious formulas/logic/parameters, model too complex, unable to create formulas/logic for the desired relationships