OBJECTIVE: The Individual Project listed on your outline is intended to have you practice on your own the skills learned in this class. This means the following capabilities:

1. - Make a free body diagram of a mechanical system, translation or rotation and an electrical circuit including capacitors, inductors, resistors and operations amplifiers.
2. - Using the techniques learned in class you should be able to use your free body diagrams and derive the differential equations that control the motion or circuit.
3. - You should be able to generate a transfer function using:
   a. Laplace transform
   n. Bond Graph automated modeling methods
4.- You should be able to obtain output equations to be used in calculation of a transfer function.
5.- You should be able to obtain the state space representation of a system
6.- Be able to obtain the frequency response (Bode Plots), impulse and step response
7.- Be able to read a time response and identify the overshoot, setting time, steady state value.
8.- Be able to obtain Root Locus Plots
9.- Design a controller using the Root Locus method or the Frequency Response method.

PROCEDURE

1. – Choose a design problem of your own that exercises the skills 1-9 listed above. You can chose one of you own interest, pick a design problem from your textbook or another one. This can be a problem of your own interest, one that you are curious to know about, one that is used in your senior project, at you work or in a research paper. Once you have chosen the problem then:
2. - Establish some design criteria with the objectives you would like to achieve.
3. - Derive equations, state space or transfer function. If the problem has these developed use the ones given. Enter that into MATLAB, SIMULINK or use CAMPG to assist you.
4. – Run Matlab or Simulink to solve the particular problem objectives.
5. - Make some observations as to what was useful in your project and make an auto assessment of what you learned with it.

WHAT YOU NEED TO TURN IN

1. - A Report in Word format describing the system, project objectives, development procedure and results.
2. - A PowerPoint presentation that summarizes your project including a description of the problem and design objectives. A summary of the solution and computer results and finally your own conclusions. Use this to present your final project to the class on the last day of instruction.
3. - Submit your project electronically to a directory set up for this class on Voyager. For example voyagefaculty\granda\ME114F08. Your directory can be named ME115F08_Final_Yourlastname, for example. Please submit all files including MATLAB, SIMULINK, CAMPG etc. as appropriate. The files can be organized in a single directory. It can have subdirectories. This will ensure your directory always to be recognized by the computer and will always be found.

DATES TO REMEMBER

1. - Be ready to present a short summary of your project on the last day of instruction, using your PowerPoint presentation. Your project may still be in progress.
2. - Due date for transferring electronically your directory with the final project will be the midnight on the last day of finals.