**ECHE 362, Senior Laboratory**

**Fall 2015**

**Duties of the Foreman and Guidelines for the Foreman’s Report**

For each experiment, your group will designate one person as the foreman for that experiment. By the end of the semester, everyone must have been the foreman for at least one experiment. The foreman serves as the group’s leader for the duration of the experiment and the write-up, ensuring that goals are set, work assignments are given to each group member, and deadlines are met. The foreman is responsible for compiling and submitting the final report – but he/she is not responsible for writing the whole thing – each group member is responsible for his/her part of the write-up as assigned by the foreman. Note that in every report, there is a required section called ‘Author Contributions’. The foreman is responsible for writing this section of the report and discussing it with the group before the report is submitted.

Prior to running an experiment, completion of the foreman’s report is required to ensure that your time in the laboratory is safe and productive. It should only be ≈4 pages, but it must be sufficiently detailed that the rest of your group can read it and know the essential elements for the experiment – how the experiment is operated, what data is to be acquired and why, what the safety hazards are, and what to do in case of an incident or accident. The first draft of the foreman’s report is due to the TA in charge of that experiment one week before you are scheduled to perform an experiment. Before this deadline, you will need to meet with the TA, and possibly Craig V, or Dr. Wainright, to gather the necessary information for this draft. The draft report will be given to the TA; they will review your draft and return it with comments within 24 hours. The second (and hopefully final) version must be approved by the TA no later than 24 hours before you are scheduled to run your experiment. If your foreman’s report is not satisfactory (a grade of B or higher), you will not be allowed in the laboratory until corrections are made – no exceptions. The foreman should discuss the approved report with the rest of his/her group the night before the experiment (or earlier) to bring everyone up to speed and to assign to each group member their tasks before you get into the lab.

For each experiment, the foreman’s report must include:

1. Safety: what are the safety hazards associated with the experiment? What precautions must be taken to minimize those hazards? What are the warning signs you should be aware of that indicate a problem with the experiment? What is the emergency shutdown procedure for the experiment? What are the warning signs that someone in the lab has been affected by the chemicals used? What are the appropriate first-aid responses in case of an accident?
2. Experimental Apparatus: provide a sketch with enough detail to show the location of the elements you will need to control/monitor the experiment – pressure regulators, pressure gauges, flow control valves, flow meters, three-way valves, shut-off valves, vents, heaters, thermocouples, etc. Some of these may be controlled/monitored by a computer – be sure to clearly indicate this.
3. Experimental Procedures: describe the procedures to be used. If any equipment needs to be calibrated – how is the calibration performed? How are the experimental variables controlled, what information needs to be recorded (by hand or by the computer), and what calculations need to be done during the lab to ensure that the runs provide the appropriate data? Often you will need an Excel spreadsheet defined with tables for recording data, and functions entered for your calculations. This spreadsheet should be included with your foreman’s report and your functions within must be verified before the lab.

*Update: for any of the sensors (temperature, pressure, flow, composition) that you are using in the lab – even if they are already calibrated, you should try to think of a simple measurement to check the accuracy of the measurement. Suggest this measurement in your foreman’s report, and with the approval of the TA, perform the measurement during lab.*

1. Experimental Runs to be performed: a listing of the desired experimental conditions required to collect sufficient data to proceed with the analysis and write-up. Think carefully and confer with the TA and/or Dr. Wainright about the design of the experiment when compiling this listing.

The foreman’s report grade is worth 30 points total for each lab. Twenty of these points are given for the written document; the other ten are given based on how well your group executes the foreman’s report while in the lab. If everyone is prepared, has been briefed on the tasks/hazards associated with the experiment, and your group functions efficiently – you get full credit. If time is wasted because your group wasn’t properly prepared, points will be deducted.

**Additional Responsibilities of the Foreman in the Laboratory:**

On the day of the laboratory, the foreman is responsible for ensuring that at the end of the lab session all the required data and observations have been recorded and copies sent to all group members, that the experiment has been completely and safely shut down, and that the laboratory area is neat and clean. Also, if there were any issues or malfunctions with the apparatus, the foreman is responsible for bringing these to the attention of the TA and Craig V. If the next group to perform that experiment is unable to do so because you didn’t perform these tasks, your foreman’s report grade for the entire group will be zero.