

Instrument Paper and Lab/Class Demo

As part of CEE 772, you will be asked to focus your studies on one of the major analytical instruments in the EVE lab. Assignments are generally made in the third or fourth week of classes. Your job will be to learn the fundamentals and specifics of your particular instrument, and work with me and one of the EWRE graduate students or post-docs to develop a laboratory exercise using the instrument. You will then serve as the lab instructor for the exercise. These lab exercises will usually take the form of demonstrations, with some participation from the rest of the class. You will also be asked to present some of the background on your instrument in class immediately preceding your laboratory demonstration. Once you have picked an instrument, make an appointment to talk to us about possible lab demos.

There are 3 major parts to this assignment:

A. Preparation and presentation of lecture material on the basics of your instrument

Just before your laboratory demonstration period, you will be asked to instruct the class regarding the fundamentals of your instrument. This will normally be done within the context of a regular lecture hour period (i.e., the Mon or Weds class period). We will help you find books or other references that you might need to consult in addition to your textbook. You will need to prepare a PowerPoint file with overheads that you wish to show the class. Please give us a copy of your PowerPoint file 2 days before your lecture so that we can review/critique it and then load it on to the class web site. We will also print them out on transparencies for your use in class. For a 50 minute class period, count on using about 30 overheads.

B. Development and execution of the laboratory exercise with your instrument

Here you will work with us on the development of a lab exercise that everyone can participate in. Some of the best exercises come from either simple application of the instrument to analysis of standard environmental analytes in water/wastewater. You may also choose to look at some applications to your own thesis/dissertation research. Either way it is important to give everyone a chance to get some “hands-on” experience.

Some of your demonstration should be devoted to exploring the capabilities of the instrument/techniques. For example, those examining gas chromatography should consider varying the column temperature program, split ratio, detector type, column type, etc. Be creative!

C. Preparation of a written report on your instrument

You will also be asked to prepare a written document on your instrument(s). It will be due on **December 11, 2019**. The document should contain the following:

1. Brief Introduction
2. Theory of the instrument
3. Physical description of the instrument with schematic diagrams
4. Detailed outline for operation of the specific instrument
5. Description of what was done in preparation for and during the laboratory demo
6. Results from the laboratory demo and important results obtained in preparation for the demo
7. Data analysis & Statistics
8. Discussion (focus on data quality and factors that may have affected it)
9. References

You should prepare one report per group. In most cases, you will just be a group of “one”, and the expected level of effort is adjusted accordingly. Please prepare these so that another graduate student can understand what you’ve written. We may place your report on file for current and future graduate students to use in helping them learn to run these instruments.