Chem 329 Week 4 TA Notes

At a glance:

Feb 13/14 Lab: First project day (Lecture 2) or Spec. Det. of Mixture (Lecture 1)

- Collect standardization lab (Lecture 2)
- Question tracking (Lecture 2)
- Project procedure design (Lecture 1)

Feb 15 Discussion:

- Collect self-graded hard copies of HW 3
- Inter-group feedback on procedure (Lecture 1) or preliminary results (Lecture 2)
- Remind students of second Weekly Discussion Survey, due 11:55pm on Friday.

Feb 15: Project procedure design part I is due (Lecture 1)

Feb 18/19 Lab: Second (Lecture 2) or first (Lecture 1) project day

- Question tracking
- Collect mixture lab (Lecture 2) or standardization lab (Lecture 1)
- Spike recovery trials (starting mostly after 2nd project day)

Feb 20/21 Lab: Third (Lecture 2) or second (Lecture 1) project day

- Collect mixture lab (Lecture 1)
- Question tracking
- If control experiment has worked, students can try beer samples and ICP.

Logistics and Feedback from last week

- Standardization feedback? Spec. Mixture feedback (Lecture 2)?
- Planning activity feedback
- Homework 2 questions/feedback

General comments on keeping track of schedule

- Course calendar on Moodle (you + students)
- Excel spreadsheet of schedule shared last week (you)
- Read these TA notes carefully!
- No weekly survey this week

Feb 14/18 Lab: Project I first day

- Collect standardization lab
- Begin using the **Question Tracker** form

See last week's TA notes and Moodle Instructor notes on tips to approach the students' questions during the project. Remember to use question tracking form for this and the next 3 lab

periods. Check students' lab notebooks for a plan and procedure for the first day; if they have trouble organizing their notebook/record-keeping, give them your insights.

Objectives of project day 1 & 2:
Students devise a control experiment using aqueous Fe samples in order to test (and practice!) the cloud point extraction and absorption techniques. There is nothing for you to prepare for the first project day but see the *Problems you may encounter* and *Planning Ahead* sections below for how you and your students should approach the project lab work.

Feb 15 Discussion Planning:
Lecture 1: Tell students to bring their current version of the designed project procedure to discussion for feedback exchanging.
Lecture 2: Tell students to bring the lab notebook where they kept records from their first day, as well as any graphs they have exported from the LabQuests (electronic form is fine).

Checklist of things to collect/print for discussion:

- Collect self-graded hard copies of HW 3 (individual)
- Print (Chem-building-permitting) and hand out ***Inter-group progress sharing*** activity (Lecture 2)

Priority 1: Homework grading
Facilitate the student self-grading activity for ~20 minutes during discussion, as described in previous staff notes.

Priority 2: Inter-group progress sharing/procedure feedback:
Have groups "pair up" and exchange feedback on their planned procedures (Lecture 1) or first project day results (Lecture 2). Allocate a time for them to talk within themselves (e.g. 10-15 min) and then have them choose one or two representatives from both groups to present the basic outcomes of the conversation to the whole section. Lecture 2 students can consult the *Inter-group progress sharing* sheet to guide their conversation, Lecture 1 students will do a similar exercise next week.

Feb 19/20 Lab: Project Day 2

- Collect mixture lab
- Continue using the **Question Tracker** form

Problems you may encounter this week in class meetings:

- **Students will feel uncomfortable with the prospect of trying their own experimental designs.** It is normal for students to feel unsure whether their experiments will work. There will be mistakes made and students will feel frustration over the experience. Point them to the learning objectives and remind them that real science pushes the boundaries of knowledge. It doesn't come out of a cookbook. Students will receive feedback on their experimental designs before coming into lab. They should

REVIEW THE FEEDBACK, and consider any changes suggested before starting lab.

- **You will feel uncomfortable fielding questions you probably don't immediately know the answers to.** Also normal is your desire as the teacher to give them the right answer so they can be successful! Your role is not to tell them what to do, but rather to model "thinking through" a problem. Rather than share what the answer is, try to talk through how you would go about solving the problem. 80% of the time, the answer lies in the research article, answers to the questions in the planning assignment, or shared in the PowerPoint presentation given at the beginning of the semester. Do, however, be clear about logistics, deadlines, and expectations from students for the different assignments.

- **Groups will omit remaking/recreating their calibration curves for each day.** Unless they can prove nothing changes by the day (they would have to use the exact same instrument, glassware, cuvet etc.,) they need to remake and recalibrate their instruments for measurements made.

- **A group may work an entire period and simply not get the method to work.** There may come a point where the experiment simply needs to be qualitative rather than quantitative. For example, what if they simply do not see a color when they mix the solutions together? Is there enough Br-PADAP in solution? What happens if you add a little more Br-PADAP? What happens if you adjust the pH by adding NaOH or HCl? You can answer these questions with a small amount of solution in a beaker and a dropper. Change the pH with a few drops of acid or base. Whoa, did you see color? Check the pH with a meter, and now design your buffer so you can target that same pH in subsequent solutions. It's okay for students to investigate—we can even call it play—to help them understand qualitatively what part each reagent plays in the chemistry. In repeat trials, they can be more exact in their measurements.

Planning ahead for the remaining project part I periods:

- *Day 1: Students create standards for Fe and attempt collecting standard curves before and after CPE. Perhaps students design and carry out a control sample.*
- *Day 2: Repeat Day 1 experiment, perform a Spike Recovery experiment. Try a beer sample?*
- *Day 3: Repeat Day 1 & 2 experiments, collect data on beer samples and prepare ICP-MS Samples. Results for ICP-MS samples submitted today will post to the course website the next business day.*
- *Day 4: Analyze data, finish up any remaining lab work. ICP-MS samples submitted today will be posted to the website the next business day.*