

Members Present:

- **BSK Analytical Laboratories:** Michael Brechmann
- **Dellavalle Laboratory:** Nat Dellavalle
- **DOJ Laboratory:** Mark Kalchik (retired)
- **Fresno City College:** Charles Francis (Training Institute Director) Dr. Karin Gruet, Amanda Henry, Dr. Kirk Kawagoe, Dr. Kent McCorkle, Christian Vellandi (Chemistry Chair), Seth Yates,
- **Fresno Pacific University:** Dr. Karen Cianci, Dr. Jonathan Dick
- **Golden Pacific Laboratories:** Thomas Moate
- **USDA SJV Agricultural Sciences Center:** Dr. Wiley Hall

Members Absent:

- **California State University – Fresno:** Dr. Saeed Attar (Chemistry Chair)
- **Fresno City College:** Kelly Fowler (Vice President of Instruction)
- **SJV-Air Pollution Control District:** Samir Sheikh

Introduction:

- We are looking for feedback.
- Two degrees proposed: AS in Chemistry (transferring) and Chemistry Certificate (feeding industry labs), see handout.
- **Chemistry Certificate:**
 - Chemistry sequence: 1A, 1B, 8A with 9A, 5, and internship
 - Math: no need for calculus (math 5A, 5B, 6), however need algebra and statistics (needed in quant)
 - Physics: no need for calculus based (4A, 4B, 4C) but 2A and 2B. Will accept 4A, 4B and 4C though.
- Could Chem 29A and 29B replace Chem 9A for AS students, as Chem 28A and 28B will be accepted for Chem 8A?
 - BSK would like them, however will consider them differently since on a higher track.
 - FA: 28A and 29A, SP: 28B, 29B, 5 and internship (with calculus and calculus-based physics)

Chem 5:

- See handout.
- Start with some titrations, but will focus primarily on instrument use.
- **Lec + Lab:**
 - Lec + Lab: 3 + 6 hr (3+2 units) or 2 + 9 hr (2+3 units): transfer vs. applied focused.
 - Prefer a heavier emphasis on lab with one dissenting opinion because there may not be enough lecture hours to support 9 hours of lab.

- 9 hours of labs coupled with an internship may be a heavy load and will also be tough on scheduling.
- No TA teaching labs. Kirk Kawagoe will be teaching Chem 9A and Seth Yates Chem 5.
- **Textbooks:**
 - Harris, Quantitative Chemical Analysis (required)
 - Ballinger and Shugar, Chemical Technician's Ready Reference Handbook (recommended)
 - Hibbert and Gooding, Data Analysis for Chemistry (recommended)
- **Lecture Topics:**
 - Want to also include sampling + chain of custody, quality assurance / quality control (topics not in traditional quant course)
- **Labs:**
 - Fiddle so can learn what to use to analyze a specific sample.
- **Experiments:**
 - Proposed list can change.
 - What is needed?
 - Do not want specific methods but individual techniques that can be used across methods
 - Techniques are taught in 1A and 1B (Gen Chem)
 - Will prefer HPLC because used in industry labs for ion chromatography
 - AA (Cr, As, Zn, ...) for water analysis
 - Any skills taught on ICP that is not on AA?
 - Technicians do mostly AA, which is routine work, the chemists work the methods.
 - ICP is more costly to run as well as necessitates more upkeep.
 - Industry labs prefer ICPs and some flame photometry
- **Lab Reports:**
 - Any industry standards?
 - BSK and Twining were comparable, however no industry standards *per se*. Reporting depends on the different industries and their different accrediting bodies.
 - We do want to have a contrast between the traditional academic lab report and what will be useful in an industry lab.
 - Can work with some different formats that are used in industry to create a common one.
 - Also, technicians do not write reports, or even read reports; senior chemists do.
 - Industries do mostly electronic reporting. Since we will be teaching skills and students just need to understand the fundamentals, we can still do hardcopy reporting.
 - Need to include calibration curves, percent recovery, etc.
 - Our report format could be: a cover sheet that states all things are good with a signature, followed by a quality control sheet and instrument data. Students will need to be aware that different formats exist and be able to use them interchangeably and reproducibly.
 - Want to stress what to do if numbers are out of bounds.

Chem 9A:

- See handout.
- **Textbooks:**
 - Lehman, Multiscale Operational Organic Chemistry (required)
 - Ballinger and Shugar, Chemical Technician's Ready Reference Handbook (recommended)
- **Labs:**
 - Want to focus on techniques needed in industry.
 - Focus on how it is done, and a bit on why it is done.
 - Not much preparative work in the potential internship labs.
 - Prepare sample + analysis.
 - No NMR since no need for structural determination.
- **Experiments:**
 - Positive feedback on our choices
 - Want gas phase work: Direct Headspace or Purge and Trap, but no SPME (Solid-Phase Micro Extraction) because not practical as it is expensive and fragile.
 - Want column chromatography (paper chromatography is performed in 1A).

Internship:

- See handout.
- The college has a blanket insurance policy.
- BSK could possibly take 6 students max, Delavalle 4 max, Golden Pacific 3 max, and USDA 1-2 max: possibly about 15 students cohort per year.
- BSK is interested in having their high school interns be funneled into the Certificate program, which is perfect for this.
- **When?**
 - Should the internship be in the last Spring semester? This will give students a solid lab background.
 - However some labs are seasonal.
 - Potential internship labs are ok with and find an advantage for students to do the internship during the first year.
- **Internship (paid or unpaid, through school) vs. work experience (paid, through employer)?**
 - No conflict between paid internships and assigning a grade.
 - May actually need both options.
 - What about students currently working in a lab, could this count as their internship? Possible if instructional faculty and Vice President of Instruction approve. However, cannot get credit for past experience but for current experience since need to satisfy the internship requirements.
 - Have a consensus in favor of paid experience but not for shadowing (such as looking at how an instrument operates). Labs prefer to give the money to the institution, and the institution

pays the students to avoid the need of background check, etc. The advantage of unpaid is that students are more motivated.

▪ **How much time is useful for students?**

- 2 units minimum – 6 units maximum (96-288 hours)
- Need at least 4 hour / block.
- Need to keep track of hours (educational policy) and document. There is no problem recording hours in the partner's lab: punch in + out, can have a report every 2 weeks.

▪ **What would be the experience?**

- Expect students to learn techniques from the host lab, not necessarily what other labs do.
- Some labs do rotations (2-3 stations). How long a rotation? At least 4 blocks of 4 hours (so 16 hours minimum). An internship of 96 hours will be sufficient.
- At BSK and Delavalle, interns mostly do sample receiving and sample prepping, but not much instrument loading.

▪ **What would be the requirement?**

- The internship will be as cohorts with both group and individual meetings. Group meetings, if possible, will allow students to share their experiences with each other.
- A presentation at the end of the internship with supervisor (from labs hosting internship) and coordinator (faculty).
- A final exit interview with supervisor (a rating form).
- ABC/DF or P/NP?
 - What is important to students? Transferring so need ABC/DF.
 - Is internship transferrable? Will certainly look good on transcripts. Usually obtaining a letter of recommendation is students' goal.
 - ABC better than P, because students are more motivated, however the prospect of obtaining a letter of recommendation will take care of that.