

***Summary for Chemistry Certificate:***

- Start date: FA13 (projected)
- 60 units total
- 22-unit core:
  - CHEM 1A + 1B: General Chemistry, 2 semesters, 10 units
  - CHEM 8A + 9A: Elementary Organic Chemistry, lecture and lab separated, 3+2 units, lab with applied emphasis
  - CHEM Quant: Quantitative Chemistry, 5 units, focused on Applied Chemical Analysis
  - Internship: 2 units
  - Possible sequence:
    - 1<sup>st</sup> year: FA = 1A, SP = 1B
    - 2<sup>nd</sup> year: FA = 8A + 9A + Quant, SP = internship
- 48 units for Math, Physics, English, and additional General Education courses
- Would enroll students in cohorts/learning communities that would include a set schedule and guaranteed registration in core classes.
- Theory for special emphasis:
  - Equilibria (specifically relevant to separations)
- Lab techniques for special emphasis:
  - Chromatography, burettes, pipettes, calibration, quality control, quality assurance
- Instrumentation:
  - GC/LC, AA, ICP

***Summary for AS Chemistry Degree:***

- 20-unit core:
  - CHEM 1A + 1B: General Chemistry, 2 semesters, 10 units
  - CHEM 28A + 29A + CHEM 28B + 29B: Organic Chemistry, 2 semesters, 10 units (lec:3 + lab:2 each)

***Next meeting:***

- In SP12 to shape up ideas.
- In FA12 to wrap.
- Then yearly to track.
- Program review is next year; curriculum review is the following year.

***Introduction of Members:***

- **BSK Analytical Laboratories:** Michael Brechmann
- **California State University – Fresno:** Dr. Saeed Attar (Chemistry Chair)
- **Dellavalle Laboratory:** Nat Dellavalle
- **DOJ Laboratory:** Mark Kalchik (retired)
- **Fresno City College:** Dr. Karin Gruet, Amanda Henry, Dr. Kirk Kawagoe, Dr. Kent McCorkle, Christian Vellandi (Chemistry Chair), Seth Yates
- **Fresno Pacific University:** Dr. Karen Cianci
- **Golden Pacific Laboratories:** Thomas Moate
- **SJV-Air Pollution Control District:** Samir Sheikh
- **USDA SJV Agricultural Sciences Center:** Dr. Wiley Hall

***FCC Courses:*****Current Courses:**

- CHEM 101P – Preparation for General Chemistry (non-transferable): projected start date is FA12
- CHEM 3A – Introduction Chemistry
- CHEM 3B –Introductory to Organic and Biological Chemistry
- CHEM 1A + 1B – General Chemistry (science majors, pre-med, pre-pharm, etc.)
- CHEM 8A – Elementary Organic Chemistry (no lab, not as rigorous as 2-semester sequence, CHEM 3A is pre-req, oenology, kinesiology, nursing, plant science, food science, GE, etc.)
- CHEM 28A + 28B –Organic Chemistry (lecture)
- CHEM 29A + 29B –Organic Chemistry (lab)

**Transfer:**

Need:

- CHEM 1A/1B sequence
- CHEM 28A/28B sequence with CHEM 29A/29B sequence

**CHEM 101P:**

- Needed because high school chemistry courses do not adequately prepare students for college level.
- Since no lab portion will be offered, can solely focus on problem-solving skills.
- CHEM 101P is designed for science majors, CHEM 3A for everybody else.
- CSU-F thinks that CHEM 3A is a good prep fro CHEM 1A. FCC does not think so. The difference between 4-year universities and community colleges is that community colleges students are less prepared than the 4-year universities ones.

**Miscellaneous:**

- CSUF does not count the CHEM 28A/28B and CHEM 29A/29B sequences as upper division. Students can take other courses as upper division.
- Can take CHEM 1A after CHEM 3A with full credit of units at CSU-F: CHEM 3A grade counts towards GPA calculations, but not counting as credit requirements for degree.

**Chemistry Degree:****Introduction of degree:**

- Open degree versus stand-alone classes?
- 20-unit core: CHEM 1A + 1B (10 units) + ?
- What do you need?
  - What skills?
  - What instrumentation do you need students to know how to operate?
  - Methodologies?
  - Specific subject matter? In a new course or integrated in a current course?
  - Values of internships for degree?
- How much demand? No chemical technician program in SJV

**Basic Chem:**

- Need CHEM 1A/1B because of equilibria.

**Quant class?:**

- Required for crime lab (state level)
- Traditional or 1-unit courses: Full class with essentials in it (4-5 units).
- Equilibrium?
  - Most of it in CHEM 1B.
  - However want some since it is basis for techniques such as extraction, chromatography, etc.
- Lab techniques:
  - Want chromatography, burettes, pipettes, calibration, quality control, quality assurance
- Instrumentation:
  - GC/LC, AA, ICP
  - No NMR because mostly pharmaceutical.
- A community college in WA (Michael Brechmann) has a certificated technician program.
- Need to verify quant background for hires (Mark Kalchik).
- CHEM Quant cannot be offered as a stand-alone class because of low demand (San Jose Community College, in busy Bay area, offer a quant class but only has about 5 students). Need to couple with something else.
- CHEM Quant can also go with oenology (CHEM 105 level, 4 units < CHEM 102, 5 units).

**O-Chem?:**

- Can have lab for CHEM 8A: CHEM 9A (2 units).
- Want to cover extraction, purification, chromatography in lab.
- Can adapt CHEM 29A experiments

**Internships?:**

- Mandatory, optional?
- Internships will be a selling point for students in terms of employment prospects.
- A very successful biotech program has internships (25-30 students): big component of program is value of internship (Saeed Attar).
- During summer?
- After CHEM 1A/1B? After CHEM 8A/9A? After Quant? What requirements?

- After Quant.
- Need to also look at seasonability.
- Length:
  - Had 2-weeks to 4-months internships (Michael Brechmann)
  - 30 hr/week during SU, 10-15 hr/week during FA/SP
  - 2 units = 96 hr
- Paid or unpaid?
  - If unpaid: what about liabilities?
- Placing 5 students should be easy, 50 not so, therefore to make it viable need a 15-20 students class.

**How will this degree affect transfer?:**

- If CHEM Quant is as rigorous as CHEM 102, it could transfer to CSU-F.
- Analytical needs to be done after O-chem (FPU).
- The AS will be a different track than BA/BS because CHEM 8A/9A (5 units) versus CHEM 28A/28B and 29A/29B (10 units).
- CHEM Quant as CHEM 105 is minor or BA at CSU-F.
- AS will be job-bound, especially if internship is a component.

**Core classes?:**

- Core: 20 units. Could do CHEM 1A/1B (10 units) , CHEM 8A (3 units), CHEM Quant (5 units)
  - with CHEM 9A (1 unit) + internship (1 unit)
  - or CHEM 9A with incorporated internship (2 units)
  - Will either of these be enough?
  - 22 units is not much more than 20 units.
  - Can we have more than 20 units for core?

**Non-core classes?:**

- Calculus and PHYS 4A/4B will not do any good for lower level degree. If too high level of math/physics students will not stop at AS, will go to BS. For technician level, need PHYS 2A/2B.
- Statistical: average, % error, standard deviation, % recovery, etc.
- An AA has no definite pathway but an AS in Science does.
- Non-core: need to pack calculus, physics.

**AS or Chem Certificate?:**

- Not all students will be able to hack PHYS 4A/4B
- For certificate can have PHYS 2A/2B
- For certificate: can have stockroom work (lots of sample prep) but internship is better.
- Students with 3 semesters of calculus will not go for an AS unless it is marketed as job larger prospect to finance BS.

**Others:**

- Could do a quick questionnaire on CHEM 1A/1B about the program (Saeed Attar).
- Routine work does not necessarily require a degree.

**Potential Obstacles:**

- Demand?
  - Need 20 students to be viable.
- Retention? Success?
  - Could do cohorts/learning communities for CHEM 1A/1B.
  - Would also help students with schedule, i.e. core and non-core classes fit together.
  - Guaranteed registration.