**Chemistry Pedagogy Course for LaMSTI/LaCart**

Students will develop an understanding of techniques that increase the learning potential of their high school students. Specific goals include

1. Content specific pedagogy applied to teaching chemistry.
2. Revisiting topics from the psychology of learning course as they apply to teaching chemistry.
3. Develop an understanding of modern course enhancement techniques and practice their implementation.
   1. Online homework
   2. Peer instruction in chemistry
   3. Computer based Animations
4. Understanding study skills and how to teach them at the high school level.
5. Understanding time management and how to teach it at the high school level.
6. Develop an understanding of what a college chemistry course expects of its students.
7. Develop course management skills as they relate to a chemistry course. Specifically, students will learn how teach at the right level of difficulty, how to challenge high school students, how to integrate chemistry material for maximum retention, develop an understanding of what material is important and why it is important, learn how to use different teaching tools to build the most effective course for their high school.

**Chemistry Content Enhancement course for LaMSTI/LaCart**

Students will strengthen their chemistry content knowledge by working chemistry problems that cover the entire first semester university level chemistry course. Students will

1. Strengthen their ability to work chemistry problems.
2. Develop an understanding of why specific problems are being asked.
3. Develop an understanding of the thought process required for high school students to become good problem solvers.
4. Improve their ability to tutor high school students to solve chemistry problems.
5. Get experience solving advanced university level/AP style chemistry problems.

**Chemistry Modeling course for LaMSTI/LaCart**

Students will learn a very new teaching pedagogy for teaching chemistry by an inquiry based method that is particularly well suited for high school level courses. Students will learn the theory and practice the implementation of teaching via the modeling teaching method.

**Chem Lab course for LaMSTI/LaCart**

Syllabus version 1

Linda: I think it’s important to have lots of time for discussion between students so that in addition to learning from us they can share what they are doing, what ideas they have, and what their problems are. Many of the ideas discussed in the syllabus below can be addressed over and over throughout our course. For example there might be a short lecture, followed by a lab, and then students stopped during the lab to ask why is this being done? Why are we asking you to do this rather than that? Finally, a follow up discussion between all students might take place to reiterate the key learning objectives and try to uncover alternative ideas from others.

“Students” = High School Teachers attending our course.

1. Students will do example labs to see how a chem lab runs from the point of view of a student.
2. Discussion sessions will take place where students interact to discuss what specific learning objectives we are trying to accomplish from the point of view of a teacher.
3. Students will participate in several labs taught in different styles so they **learn** and **practice** skills required to teach
   1. Traditionally taught labs
   2. Inquiry based instruction
   3. Honors labs
4. Students will practice developing their own experiments on paper and compare the finished product with other students so that different strategies and shortcomings are exposed.
   1. What are the resources?
   2. How is an inquiry based lab developed?
   3. Practice writing up an experiment for their high school students. How would the write up be different for an honors course, an inquiry based lab, and a normal lab?
5. Students will develop an understanding of LSU’s entire lab program through lecture and discussion so that each student can take away some idea of what our course is about and what rationale is for the entire scope of our program. What is emphasized in our course and why? What is not?
6. Students will learn lab logistics through lecture, hands on experience, and discussions with other teachers. Why are the labs and stockroom set up as they are? Why are the balances here and the distilled water there?
7. Students will learn strategies for approaching high school administrators to request funds to set up a lab. What is the justification a teacher needs to understand to sell the idea of a chem. lab to a high school principle? What would be required in funds and manpower to set up a chem lab.
8. Students will compare how their current labs, if any, are set up. Maybe on day one they can be asked to write down what their present course learning objectives are and then revisit those at the end of the course to see if we have broadened their thinking.
9. Understand how to add lab enhancements.
   1. How to set up and run a lab practical lab final exam.
   2. Some other great idea of lab enhancements from Linda A.
10. Students will learn and discuss what a lab report should look like at the high school level? What are the learning outcomes from high school student lab reports. What directions are given to high school students for writing lab reports. How are lab reports graded?
11. Students will learn the benefits of giving prelab quizzes. Students will learn and practice how to develop and deliver prelab quizzes.
12. Students will learn how to use online virtual labs for schools that cannot afford labs. Do we want to go down this road?