

August 20, 2012

Dear Parent of a First Year Chemistry Student,

We would like to take the opportunity to say how pleased we are to have your son or daughter in one of our introductory chemistry courses. We are committed to providing our students with the very best education possible.

We have seen some exciting changes in chemical education over the past couple of decades. Chemistry classrooms across the United States are beginning to look very different from what you may have seen when you were in college. Some of those changes are related to the ways in which chemistry is increasingly practiced in clinical and industrial laboratories and research.¹ Many new developments have been driven by time-tested findings from educational research.²

More and more, graduates with chemistry experience are expected to solve complex problems that draw on conceptual information from multiple fields. As a result, there have been repeated calls to move away from courses based on rigid sub-disciplines such as organic or physical chemistry.³ Instead, the material with the broadest value to students can be presented in settings that highlight useful applications and reinforce key concepts

There is now a vast wealth of educational research telling us that packing classrooms with large numbers of students so that an instructor can efficiently lecture to them is not the best way to teach science.⁴ In fact, students show stronger retention of material if they work in teams of peers to develop key concepts, provided this work is reinforced by brief, periodic presentations from the instructor.⁵ Many students initially resist team learning, but later develop an appreciation for how well they have retained material learned in this manner.⁶ Of course, reading and practicing outside class is as valuable as it ever was.

At CSB/SJU, chemistry students have the distinct advantage of being in small classrooms equipped with round tables to facilitate teamwork. We have been practicing student-oriented team learning methods in our department for over twenty years. In addition, our small size, as well as the breadth of training among our faculty, has allowed us to develop innovative new courses designed to cover key concepts from organic, inorganic and biochemistry in the first two years. Practice in these areas serves to reinforce basic physical ideas about structure, bonding, thermodynamics and kinetics. These courses are also designed to meet American Chemical Society guidelines and to help prepare students for other requirements that draw on knowledge of chemistry, such as the Medical College Aptitude Test.

Because our introductory chemistry courses use materials from multiple areas to develop basic concepts, a first-year chemistry course will not look like the course you took in college, and it will probably not look like a course at another college. Nevertheless, by completing a two-year sequence of chemistry courses at CSB/SJU (normally required by medical schools, for example), your son or daughter will have an excellent foundation with which to pursue graduate or professional studies.

We wish your son or daughter the best in their college experience, and encourage them to participate fully in the classroom in order to make the most of their learning opportunities.

Sincerely,

CSB/SJU Chemistry Department

¹ George Whitesides and John Deutch, "Let's Get Practical", *Nature* **2011**, 469, 21-22.

² Norbert J. Pienta, "Declaring a New Year's Resolution" *J. Chem. Educ.* **2012**, 89, 1-1.

³ Martin Goedhart, "A New Perspective on the Structure of Chemistry as a Basis for the Undergraduate Curriculum", *J. Chem. Educ.* **2007**, 84, 971-976.

⁴ a) J. N. Spencer, "New Approaches to Chemistry Teaching", *J. Chem. Educ.* **2006**, 83, 528-533.

b) Louis DesLauriers, Ellen Schelew and Carl Wieman, "Improved Learning in a Large-Enrollment Physics Class", *Science* **2011**, 332, 862-864.

⁵ Eric Mazur, "Farewell, Lecture?", *Science* **2009**, 323, 50-51.

⁶ <http://www.npr.org/2012/01/01/144550920/physicists-seek-to-lose-the-lecture-as-teaching-tool?sc=emaf>