

- **IPEDS enrollment, Fall 2010:** 34,654
- **Type of community:** Suburban
- **Number of campuses:** 14; chemistry is taught online and at 6 campuses; lab sections are available at 3 campuses
- **Number of chemistry students, Fall 2011:** 2,400
- **Number of full-time chemistry faculty:** 5
- **Number of adjunct chemistry instructors:** 20 (varies depending on semester)
- **Structure:** Chemistry Program is within the Natural Sciences Division
- **Focus of chemistry program:** Transfer
- **Sections of the Guidelines used:** 3.1, 3.2, 4.2, 4.3

Peter Iles, chairman of the Natural Sciences Division and a chemist, and **Luther D. Giddings**, assistant professor and coordinator of the Chemistry Department, used the *American Chemical Society (ACS) Guidelines for Chemistry in Two-Year College Programs* to

- Add full-time chemistry faculty members
- Acquire instrumentation
- Increase the computational software available to students

Demand for chemistry courses at Salt Lake Community College (SLCC) grew steadily after 2000 as unemployment increased and general economic conditions drove college-wide enrollment growth. The economic downturn also affected state finances and created budget constraints for the college. SLCC tried to save money by not filling some positions when full-time faculty members retired or left for other employment. Attrition left the Chemistry Department with three rather than four full-time faculty members in 2009. Every full-time faculty member was teaching an “overload,” which was compensated at the rate paid adjunct instructors.

Full-time faculty members also guide students in service learning and research projects, for which they do not receive additional pay. “It has been our good fortune that when necessity has made it essential, people have been willing to shoulder an extra load even when that extra load is not compensated,” Giddings said. Budget limitations added to the challenge of obtaining funds for new chemistry equipment and instrumentation.

Making the Case to Add Faculty

For several years in a row, Giddings requested additional full-time faculty when he and Iles met to identify the Chemistry Department’s budgetary priorities. It was not until the release of the current version of the Guidelines in 2009 that the two men decided to cite the Guidelines to justify their formal budget request to Dean Clifton G. Sanders. They focused their advocacy on the recommendation for permanent faculty to teach more than 75% of the total chemistry offerings and the related recommendation that faculty and staff members not exceed 15 contact hours of classroom and laboratory instruction per week.

Sanders, who is also a chemist, values the Guidelines and understands their value but must weigh the needs of the chemistry program against those of the other science programs. In fact, Iles noted that the Chemistry Department has consistently had one of the highest student-to-faculty ratios (118:1) at the college. For this it is considered one of the most efficient departments at SLCC. However, even when every course section is filled to capacity, students are still being turned away from chemistry classes. While the college’s enrollment system does not make it possible to track the number of students shut out of classes, Giddings said the number of students who have approached him to see if he can add them to closed sections increased in 2011 when the college implemented caps on the number of students and the number of course sections. The college’s enrollment grew 26% from 25,129 in 2006 to 33,983 in 2010 while state support decreased.

Giddings said he decided to use the Guidelines for leverage in the budgeting process because other academic departments cited accreditation requirements and professional organizations' standards to obtain budget increases. Sanders confirmed that the Guidelines have provided leverage for funding decisions in recent years and that no one involved in the budgeting decisions questioned the validity of the ACS recommendations.

Sanders also found that the Guidelines were useful when he cochaired Utah's statewide curriculum committee. He went on to say that this group provided the framework for addressing 90% of the curriculum issues. The fact that all the public four-year institutions in Utah had ACS-approved programs also facilitated alignment between the two-year and four-year programs.

By 2010–2011, the SLCC Chemistry Department had five full-time faculty members. Because the department still has fewer full-time faculty than the Guidelines recommend, Iles said he plans to request funding for two or three additional full-time faculty members in the future.

Citing Guidelines for Equipment Expenditures

Giddings and Iles report having more success obtaining new instrumentation since they began citing the relevant recommendation in the Guidelines in their requests for equipment funds. The recommendation is that programs "have a suite of modern chemical instrumentation and specialized laboratory apparatus appropriate for the courses offered."

The Chemistry Department was allocated \$80,000 two years in a row to upgrade laboratory equipment. In 2009–2010, the money was used to purchase a high-performance liquid chromatograph

(HPLC), a BASi Voltammetric Analyzer, and a gas chromatograph–mass spectrometer (GC-MS) for use in organic chemistry courses. In 2010–2011, the department's request to purchase data processing software and 60 sets of sensors for students to use in General Chemistry was approved.

The recommendations in the Guidelines "are one of the tools I use. I'll use any tool I can. That's why if companies want to donate equipment they're replacing, we'll take that," Iles said. Donations from local companies have provided the college with a scanning electron microscope, an atomic absorption spectrometer, and three gas chromatographs. The microscope, a nanotechnology instrument, was donated to the Engineering Department, but chemistry students are gaining experience using it and other microscopes in the nanotechnology courses they are encouraged to take. For several years, the Biotechnology Department has allowed chemistry students to use its HPLC and GC-MS for their research projects.

"The ACS Guidelines and membership are very useful, but they are not the only resource," Iles concluded.

The content of this case study was provided by Peter Iles and Luther D. Giddings. In addition to serving as chairman of the SLCC Natural Sciences Division since 2003, Iles teaches two online chemistry courses as an adjunct faculty member. Before immigrating to the United States, Iles was a senior lecturer at RMIT University in Melbourne, Australia, where he led a research group in chemical sensors for 10 years. Iles earned a B.App.Sc. in chemistry from Victoria Institute of Technology (Australia), an M.App.Sc. in chemistry from the Footscray Institute of Technol-

ogy, and a Ph.D. in chemistry from La Trobe University, Australia. Iles has 2 patents and more than 100 journal articles and conference presentations to his credit. He coauthored an electrochemistry textbook and a chapter in a textbook on photopolymerization for chemical sensors.

Luther Giddings, coordinator of the SLCC Chemistry Department, earned a Ph.D. in chemistry from Ohio State University and a B.S. from the University of Utah, where he majored in chemistry. He joined the SLCC faculty in 2001 as an adjunct instructor; he became a full-time instructor there in 2004. He was a guest lecturer at Ohio University and coordinator at Brigham Young University before joining SLCC's faculty. In 2004, Giddings received the Teaching Excellence Award from the SLCC Foundation and the Shining Star Award from the college's TRIO Program.