



Committee on Professional Training

American Chemical Society 1155 Sixteenth Street, N.W. Washington, D.C.

In This Issue ...

Proposed Revisions to the ACS Guidelines 1

Paving the Pathways for Tomorrow's Chemistry Students: Part 1 3

Preparing for Life after Graduate School: A New Program from the ACS Office of Graduate Education 5

Revising the ACS Guidelines for Two-Year and Four-Year Programs: A Community Dialogue of Issues and Opportunities 6

DGRweb: Now Free and Improved! See page 7 for details.

Participate in ongoing discussions about the guidelines revisions during the upcoming:

- Council on Undergraduate Research (CUR) National Conference, Greencastle, IN 7
- Biennial Conference on Chemical Education (BCCE), Purdue, IN 5
- ACS National Meeting, San Francisco, CA 1

Is your department looking for a new faculty member? Then don't miss the opportunity of meeting the academic candidates during the upcoming Academic Employment Initiative event. See page 6 for details.

Proposed Revisions to the ACS Guidelines

Promoting excellence in chemistry education is an important activity of the American Chemical Society (ACS). The Society has charged the Committee on Professional Training (CPT) with developing and administering guidelines for approval of undergraduate chemistry programs. The ACS Guidelines affect 635 currently approved chemistry programs, chemistry programs aspiring for ACS approval, graduate schools who matriculate students trained at ACS-approved programs, and the chemistry industry which employs students trained at ACS-approved programs.

The ACS Guidelines are regularly updated to reflect changes in the chemistry profession and in chemistry education. Chemistry is becoming more multidisciplinary, addressing more complex problems, using more advanced techniques, and is increasingly affected by globalization. At the undergraduate level, educators are exploring new pedagogical approaches, emphasizing integrative skills such as communication and teamwork, and designing programs to embrace an increasingly diverse student body. To address these changes, CPT is undertaking a major revision of the ACS Guidelines.

Background. The first step of the guidelines revision process was a broad call for public comment on the ACS Guidelines and possible directions for future revision. Thus, the chemistry community was informed of the guidelines revision process in previous *CPT Newsletters* (Fall 2004 p. 1, Summer 2005 p. 1, and Winter 2005 p. 1), the *Journal of Chemical Education* (December 2004 p. 1695), and *Chemical & Engineering News* (April 25, 2005 p. 42), as well as through national symposia, oral presentations, and CPT open meetings. In response to this widespread publicity, numerous thoughtful comments and suggestions were received by CPT over the last year.

The second step of the guidelines revision process was for CPT to draft proposed revisions to the ACS Guidelines in response to the comments from the chemistry community. The broad goals of these proposed revisions are to:

- Simplify the ACS guidelines and procedures for approval of chemistry programs.
- Provide greater flexibility to approved departments for designing certified degrees.
- Encourage innovation and improvement in curriculum and pedagogy by approved programs.
- Define faculty and infrastructure attributes that

Revision of the ACS Guidelines for Undergraduate Chemistry Programs

Symposium cosponsored by CHED, CPT, and SOCED

Fall 2006 ACS National Meeting, San Francisco

Monday,

September 11, 1:30 p.m.

Join CPT for an interactive symposium to learn about and discuss the proposed new ACS guidelines for curriculum, process skills, pedagogy, faculty, infrastructure, and self-evaluation.

support excellent undergraduate chemistry programs.

CPT recently released a document describing the goals of program approval, attributes of excellent chemistry programs, and proposed revisions of the guidelines. While proposed changes in the guidelines for curriculum, process skills and pedagogy, faculty and infrastructure, and program self-evaluation are summarized below, readers are encouraged to download the full document from the CPT website (www.chemistry.org/education/cpt).

Summary of Proposed Revisions. In the proposed new guidelines, previous core and advanced course requirements will be replaced with "foundation" and "in-depth" course work. Beyond introductory chemistry, five one-semester foundation courses will provide breadth of coverage in each of the major areas of chemistry: analytical, biochemistry, inorganic, organic, and physical. An additional twelve semester credit hours of in-depth coursework will further develop or integrate topics introduced in foundation courses. In-depth courses might include the second semester of courses like organic or physical chemistry that are commonly taught as a two-semester sequence. They could also

Continued on Page 2

Continued from Page 1

include courses that integrate foundation areas, or even specialized courses containing a significant amount of chemistry that are necessary for a degree track (see below). Acceptable combinations of courses leading to a certified degree would be defined by the department. Thus, the chemistry curriculum would not be as constrained by ACS requirements, but rather could be defined by a department to better meet the needs of its student body and take advantage of local strengths and opportunities.

The laboratory component of the foundation courses would be at least 180 hours, preferably involving all five foundation areas of chemistry. The total number of required hours is proposed to be a minimum of 400 hours beyond the introductory chemistry experience.

The flexibility of in-depth courses will allow departments to design their own specialized degree tracks that focus on a specific chemistry subdiscipline or provide an interdisciplinary experience. Thus, it is proposed that department-defined degree tracks will replace the previous ACS-approved degree options (chemistry, biochemistry, chemical physics, environmental chemistry, materials, polymers, chemistry education). Departments could still offer these specialized degrees as certified degrees, as long as they met the foundation, in-depth, and laboratory requirements. Departments would also have the flexibility to develop their own specialized degree tracks that reflect modern developments in chemistry or local faculty expertise.

The proposed ACS guidelines recognize the importance of opportunities that allow students to develop process, communication, and teamwork skills. They also stress the importance of deliberately considering pedagogical approaches that best permit students to learn chemistry content and develop skills vital to their future success. Departments would be asked to describe how learning of process skills is incorporated into the curriculum and what efforts are being made to encourage effective pedagogical practices.

In order to reflect the breadth of modern chemistry and observe appropriate teaching contact hour limits, it is proposed that the minimum number of faculty for approved departments be increased from four to five. However, currently approved four-member departments would remain approvable until their size increases. Other infrastructure requirements remain relatively unchanged.

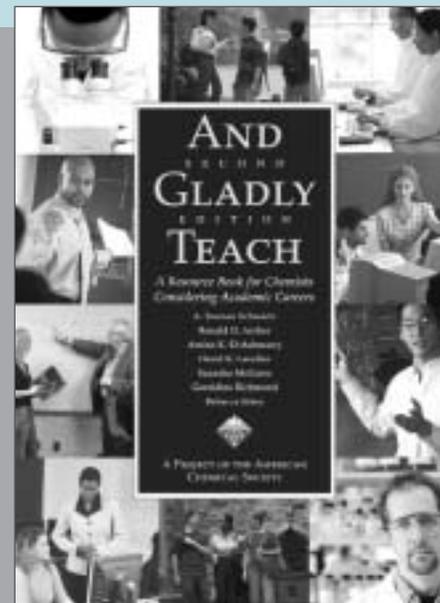
To promote excellence in chemistry education, the proposed guidelines would encourage self-evaluation by approved departments as a means of continual improvement. Departments would be asked to summarize their most recent self-evaluation and outline their plans for acting upon the resulting recommendations.

In proposing these revisions, it is expect-

AND GLADLY TEACH: A Resource Book for Chemists Considering Academic Careers

The ACS Office of Graduate Education and the Department of Career Services have published the second edition of *And Gladly Teach: A Resource for Chemists Considering Academic Careers*. Among the specific topics included in this 81—page book are the nature of an academic position in various types of institutions; preparations to make while still in graduate school; choosing between a postdoctoral position and a temporary teaching job; preparing a curriculum vitae, research proposal, and statement of teaching philosophy; campus visits for job interviews; weighing competing job offers; and balancing time demands in working toward tenure. Differences among institutions and issues of concern to women and underrepresented minorities are addressed as appropriate. Interspersed within the chapters are statements from twelve recent Ph.D.s, describing their trajectories toward academic careers. The book ends with an extensive bibliography of printed and electronic resources.

The book consists of four chapters. The first chapter, "Deciding on an Academic Career," describes an academic career as one would experience it in two- and four-year colleges and comprehensive and research-intensive universities. The second and third chapters, "Preparing for an Academic Career" and "Searching for



an Academic Position," respectively, provide pointers on moving toward this career. Assuming that one will be successful in attaining the faculty position, the fourth chapter, "Keeping an Academic Job," talks about what to expect in the first years on the job and suggests coping strategies for balancing the new responsibilities.

A complimentary copy of *And Gladly Teach*, can be requested via e-mail from the ACS Office of Graduate Education at GradEd@acs.org.

ed that most currently approved programs could meet the new guidelines with minimal changes. However, a major goal of the new proposed ACS guidelines would be to facilitate and stimulate curricular change in the curriculum, in the skill sets that students learn, and in departmental approaches to self-improvement.

Call for Response to Proposed Revisions. Given the broad impact of the ACS Guidelines for approval of undergraduate chemistry programs, it is vital to obtain as much feedback as possible about any proposed changes from the entire chemistry community. In addition to availability on the CPT website, the proposed revisions were sent to the chair of every ACS-approved department with a request that they be distributed within the department and discussed, so that departmental responses could be offered to CPT. A two-hour open CPT meeting was held at the

Spring 2006 ACS National Meeting in Atlanta, at which over 80 audience members asked questions and offered comments about the proposed changes to the guidelines. At the Fall 2006 ACS National Meeting in San Francisco, an interactive symposium on the proposed guidelines will be held, during which audience members will have extensive opportunity to discuss these issues with CPT.

CPT greatly values feedback about the proposed guidelines from all chemical constituencies, as these comments will inform the Committee's future work of incorporating the proposed revisions into the next edition of the ACS Guidelines. Comments should be emailed to cpt@acs.org with "ACS Guidelines Revision" in the subject line. Comments are welcome at any time, but those received before August 1, 2006, will be considered by the Committee during its next meeting. ■

Paving the Pathways for Tomorrow's Chemistry Students: Part 1

As part of his initiative “The Chemical Enterprise in 2015,” 2005 ACS President William F. Carroll, Jr., raised the question: Where will our students come from?

The answer is not a simple one. More undergraduate students are taking classes at different institutions, some while still in high school, and an increasing number are attending community colleges.

The answer also raises additional questions regarding ways to help students from a variety of backgrounds obtain a quality education in chemistry. If the chemistry community is to broaden participation in and increase the understanding of science and chemistry, it must respond to the shifts in higher education enrollment patterns and participate in local, regional, and national efforts to facilitate undergraduate transitions across institutions.

Changes in Students' Trajectories

Many undergraduate students do not experience a college education in a linear fashion. As a result, chemistry programs are likely to have increasing numbers of students and majors who take at least one chemistry course at a different institution. Of all undergraduates, 57% attend more than one institution; 35% cross state lines to do so (20% of four-year students, and 12% of community college students); 20% earn acceleration credits via examination or dual enrollment; and 62% attend during the summer terms.¹ The academic reasons for these different trajectories range from inadequate preparation to a desire to pursue additional educational opportunities, such as study abroad or multiple degrees. Personal circumstances are often a factor as well. Regardless of the reasons for “swirling” between institutions, the number of students following alternative pathways in higher education is increasing.²

Changes in Student Demographics

Community colleges, with their wide range of missions and diverse student bodies, play an increasingly important role in higher education and preparing students for careers in science. More than half of the students currently pursuing postsecondary education in the United States are enrolled in community colleges,³ and the total enrollments (both full- and part-time) at two-year institutions rose from 5.2 to 5.9 million from 1990 to 2000, with underrepresented minorities increasing their attendance by 65% during the same period.⁴ The average age of these students has also decreased over the past two decades due to an increase of students between 18 and 24 years of age-students who

are more likely to transfer.⁵ Successful transfer from a community college to a four-year institution is often the only opportunity for low- to moderate-income students to graduate with a bachelor's degree.

The statistics clearly indicate that community colleges play a key role in educating and diversifying the scientific workforce. As Table 1 indicates, 37% of 1999 and 2000 bachelor's and master's degree recipients in the physical and related sciences attended community colleges.⁶ Although already a significant percentage, the numbers could increase. As Table 1 also shows, 46% of the life and related sciences, and 44% of all of the science, math, and engineering degree recipients overall attended community colleges.

The Range of Transfer Policies and Programs

Since facilitating student transfer is an involved process, there is no simple solution or single strategy to recommend. Chemistry faculty and students are in systems that vary between, and sometimes within, states.

A majority of states have instituted policies addressing the academic aspects of transfer and articulation: Thirty states have transfer and articulation policies written into their legislation; 40 states have established statewide cooperative agreements among institutions or departments; 33 states require institutions to report transfer data; and 18 states provide incentives and rewards such as special financial aids, guaranteed credit transfer, or priority admission. To help prospective transfer students, 26 states have developed statewide articulation guides to describe transfer requirements and procedures. In addition, 23 states have developed a common core of required courses to eliminate confusion about what students need to take. Finally, eight states have adopted a common course numbering system for two- and four-year institutions to clarify which credits are transferable.⁷

Although the landscape is complex, each system provides a framework for addressing the needs of students and ensuring they are informed about their options and prepared for their future studies.

Opportunities to Improve Access

Chemistry faculty must be involved during the establishment and implementation of transfer and articulation policies. The level of involvement extends from providing information about course equivalencies to developing specific policies and programs for chemistry students. At the 18th Biennial Conference on Chemical Education (BCCE) symposium “Undergraduate Transition: Enhancing

Transfer is the procedure by which student credit hours earned at one institution are applied toward a degree at another institution.

Articulation refers to the statewide policies and/or agreements among institutions to accept the transfer of credits.

Student Success,” several chemistry faculty members shared their experiences.

Herb Strauss from the University of California–Berkeley described the role of the chemistry IMPAC (the Major Preparation Articulation Committee) in coordinating programs in the University of California, California State University, and the state's community college systems.

Doug Sawyer from Scottsdale Community College described how the Chemistry Articulation Task Force coordinated the efforts of colleges in Arizona, developing officially approved individual course equivalencies, acceptable degree pathways in chemistry, and a course numbering guide.

Joan Sabourin from Delta College described how individual colleges in the state of Michigan have determined transfers independently and how faculty have worked with the Michigan Association of Collegiate Registrars and Admissions Officers (MACRAO) to address questions of transferability.

Dennis Lehman from the City Colleges of Chicago described the disciplinary panels in the Illinois Transfer Initiative (IAI), which consists of public and independent institutions (54 two-year and 57 four-year).

Efforts of these and other chemistry faculty help ensure that “swirling” students will know what courses will transfer as they pursue their studies. To be truly effective, however, programs focused on improving access must be complemented by efforts to support students prior to, during, and after transfer.

Continued on Page 4

TABLE 1.
Percentage of Bachelor's and Master's Degree Recipients in 1999 and 2000 Who Attended Community College

44%	.....	overall
37%	.....	physical and related sciences
40%	.....	engineering
42%	.....	computer and math sciences
45%	.....	social and related sciences
46%	.....	life and related sciences

Tsapogas, J. The Role of Community Colleges in the Education of Recent Science and Engineering Graduates. *NSF InfoBrief*, April 2004. <http://www.nsf.gov/statistics/infbrief/nsf04315/> (accessed on February 1, 2006).

Continued from Page 3

Opportunities to Improve Success
Chemistry programs and faculty at both two- and four-year institutions must help ensure that transfer and articulation policies are implemented in a way that helps students gain access to chemistry programs and graduate. A report⁸ on the BCCE symposium, "Undergraduate Transition: Enhancing Student Success," lists the key recommendations, which fell into three categories:

- Increase awareness of the various approaches facilitating transfer across institutions and encourage the involvement of chemistry faculty in these efforts.
- Improve communication among all parties involved—students, advisors, administrators, faculty at the transferring institution, and faculty at the receiving institution.
- Develop partnerships for sustaining regular interactions, promoting the benefits to all partners and maintaining a focus on students.

As those involved noted, it takes time and commitment to establish and maintain effective partnerships. Many started with small specific projects that opened doors to additional opportunities.

Opportunities to Share Strategies

The dialogue on student transitions did not start or end at the 18th BCCE. It is continuing, fostered by the need to address changing student trajectories and the revisions of two sets of ACS guidelines for the chemistry community.

Thanks to the ACS approval process for

Although ACS does not have a program for approving transfer programs, the *Guidelines for Chemistry Programs in Two-Year Colleges* serve as a resource for both internal and external program reviews and evaluations, and are designed to help institutions offer chemistry courses and programs that:

- Are consistent with the mission of the institution.
- Meet the needs of the diverse backgrounds and abilities of entering students.
- Use and enhance the strengths of the institution and the community.
- Articulate with the chemistry programs at those four-year colleges to which most students transfer.
- Are comparable with programs of recognized quality.
- Augment the continuing education and other local community chemistry education needs.

The current edition of *Guidelines for Chemistry Programs in Two-Year Colleges* is available at www.chemistry.org/education/2year.html. Requests for hard copies should be sent to education@acs.org.

Certificates for ACS-Certified Graduates

Chemistry majors who receive a baccalaureate degree from an ACS-approved college or university and complete a curriculum described in the ACS Guidelines may be certified to the Society for membership purposes by the head or chair of the approved program. We will be happy to send certificates to certified graduates. When requesting certificates, please include the students' current mailing addresses. If you would like to have certificates available for presentation to your certified graduates, please let us know the number of certificates that you would like and the date that you need them. Send all requests to the Office of Professional Training, American Chemical Society, 1155 Sixteenth St., N.W., Washington, D.C. 20036, or by e-mail to cpt@acs.org.

four-year programs, most four- and two-year chemistry programs are familiar with the ACS Guidelines that define high-quality chemistry undergraduate programs leading to bachelor's degrees. Yet many remain unaware of another resource, designed specifically for two-year programs by the Society Committee on Education (SOCED): *Guidelines for Chemistry Programs in Two-Year Colleges* (see sidebar). Although the latter guidelines are not used in any formal ACS approval process, they do serve as a guide for institutional self-studies and program reviews.

Since the *Guidelines for Chemistry Programs in Two-Year Colleges* are focused on transfer programs and should be revised to reflect the revisions being made to the ACS Guidelines, SOCED and the Committee on Professional Training have been discussing the respective revisions and ways in which the two- and four-year programs can work together to enhance undergraduate education in chemistry.

The chemistry community has the opportunity to foster interactions between two- and four-year programs and coordinate the guidelines changes. This discussion will continue during an upcoming interactive symposium titled "Revising the ACS Guidelines for Two-Year and Four-Year Programs: A Community Dialogue of Issues and Opportunities" at the 19th BCCE (see next page), in future issues of the *CPT Newsletter*, and hopefully among chemistry programs across the country.

Faculty from two- and four-year colleges are invited to share the challenges associated with student transfer and their strategies for overcoming them. How do you ensure that:

- Transfer students have the prerequisites needed for chemistry courses?
- The level of the courses that students have taken is appropriate?
- Students have sufficient support prior to and after transferring?

Answers to these questions and additional insights should be sent to Jodi Wesemann at j_wesemann@acs.org. Input received by June 30, 2006, will help shape Part 2 of "Paving the Pathways for Tomorrow's Chemistry Students."

Preparing for 2015

Responding to the changes in student trajectories and demographics is critical. In the report *The Chemical Enterprise in 2015*,⁹ Joe Francisco, Purdue University, predicted, "In 2015, the biggest difference will be that the chemistry enterprise will engage the full intellectual talent and assets of our culturally diverse American population." Improving student transfer will help fulfill this prediction.

Coordinated efforts are needed to overcome the challenges. In the same report,⁹ John Clevenger, Truckee Meadows Community College, predicted "In 2015, community colleges will be more diverse—in their students, instructional technologies, curricula, times, locations, and nontraditional revenue sources. This will necessitate more alliances among institutions to serve students with diverse educational backgrounds, ethnicity, economic backgrounds, disabilities, and ages..."

As the participants at the 18th BCCE symposium concluded, sharing the information on approaches to solving the problems of students' transfer will help awareness. Facilitating such a dialogue will help the chemistry community respond to the changing world of higher education while enhancing the quality of undergraduate education.

1. Adelman, C. *Principal Indicators of Student Academic Histories in Postsecondary Education*,

CONGRATULATIONS!

The Committee congratulates the following school on its newly ACS-approved bachelor's degree program in chemistry:

Savannah State University

The current number of ACS-approved programs is 635.

- 1972–2000; U.S. Dept. of Education: Washington, DC, 2004.
- Borden, V. M. H. *Accommodating Student Swirl: When Traditional Students Are No Longer the Tradition*. *Change* 2004, (March/April).
 - Education Commission of States, *Transfer and Articulation Policies*, February 2001, *ECS StateNotes*. [<http://www.ecs.org/clearinghouse/23/75/2375.htm>] (accessed on January 26, 2006).
 - National Center for Education Statistics. *Digest of Education Statistics*, 2002 (NCES 2003060); U.S. Department of Education: Washington DC, 2003; p 245.
 - Adelman, C. *Moving Into Town—And Moving On: The Community College in the Lives of Traditional-Age Students*; U.S. Department of Education: Washington, DC, 2005.
 - Tsogas, J. *The Role of Community Colleges in the Education of Recent Science and Engineering Graduates*. *NSF InfoBrief*, April 2004. <http://www.nsf.gov/statistics/infbrief/nsf04315/> (accessed on February 1, 2006).
 - Institute for Education Sciences. *State Transfer and Articulation Policies Table*. <http://nces.ed.gov/programs/coe/2005/section5/table.asp?tableID=300> (accessed on February 2, 2006).
 - Wesemann J. L. *Undergraduate Transitions: Enhancing Student Success*. *J. Chem. Ed.* 2005, 8 (2), 196–198.
 - Carroll, Jr., W. F.; Raber, D. J. *The Chemistry Enterprise in 2015*. American Chemical Society: Washington DC, 2005. ■

Revising the ACS Guidelines for Two-Year and Four-Year Programs: A Community Dialogue of Issues and Opportunities

19TH BIENNIAL CONFERENCE ON CHEMICAL EDUCATION

July 30–August 3, 2006, Purdue University

Changes in the world of higher education and chemistry curricula have prompted ACS to revise and update its guidelines for four- and two-year programs. This interactive symposium will focus on curricular guidelines, developing student skills and abilities for student success, as well as faculty, facilities, and resource guidelines. Opportunities to facilitate student transitions between institutions will also be discussed. The symposium will include open forums to obtain community input on issues associated with the ACS Guidelines revision process.

TUESDAY, AUGUST 1, 1:15 – 4:35 p.m.

SESSION 1

The ACS Guidelines for Chemistry Programs in Two-Year Colleges: A Status Report

Maureen Scharberg, *San Jose State University* (10 min)

In spring 2005, the Society Committee on Education established a task force to consider the revision of the *ACS Guidelines for Chemistry Programs in Two-Year Colleges*. A summary of the discussions and feedback obtained from an informal survey and workshop will be presented, along with an overview of future plans.

Changes in the Guidelines and Evaluation Procedures for ACS Approval of Four-Year Programs: Curricular Aspects

William Polik, *Hope College*

In fall 2004, the Committee on Professional Training began the process of revising the guidelines and evaluation procedures used for ACS approval of four-year undergraduate chemistry programs. An overview of the process of gathering input will be provided, and a document summarizing proposed changes will be shared. The changes related to curricula will be described in more detail.

Considering the Curricular Impact of the ACS Guidelines

Facilitator: William Polik

Breakout groups will discuss how current chemistry curricula fit within the proposed new guidelines and explore how curricular innovations could be implemented.

SESSION 2

Changes in the Guidelines and Evaluation Procedures for ACS Approval of Four-Year Programs: Student Skills and Abilities

Joel Shulman, *University of Cincinnati*

Community input to the Committee on Professional Training has emphasized the need to focus on the skills and abilities that students develop during their undergraduate education. The proposed guidelines and the CPT evaluation process will be described in more detail.

ACS Guidelines for Chemistry Programs in Two-Year Colleges: Opportunities to Focus on Student Skills and Abilities

Richard Jones, *Sinclair Community College*

The need to focus on learning outcomes and assessment was highlighted by the outcomes of the fall 2005 survey and during meetings conducted by the task force on the revision of the *ACS Guidelines for Chemistry Programs in Two-Year Colleges*. Programs that have assessed their students' skills and abilities will be highlighted. Ways in which such activities could be encouraged by the guidelines will be considered.

Fostering and Evaluating the Development of Student Skills and Abilities

Facilitator: Joel Shulman

Breakout groups will explore ways in which the development of student skills and abilities can be demonstrated and evaluated. The resources needed for such evaluations will be discussed.

SESSION 3

Aligning the Guidelines for Two- and Four-Year Programs: Student Mentoring and Advising

Tamar (Uni) Susskind, *Oakland Community College* (retired)

Recognizing the critical role that advising plays in fostering student transfer, the task force on the revision of the *ACS Guidelines for Chemistry Programs in Two-Year Colleges* recommended that the advising, articulation, and alliances guidelines be revisited. Ways in which they can be strengthened by working with four-year programs will be discussed.

Aligning the Guidelines for Two- and Four-Year Programs: Faculty, Facilities, and Resources

William Polik, *Hope College*

Successful transfer from two- to four-year programs is facilitated when the levels of lower division courses are aligned. Expectations regarding the use of instrumentation and library resources during the first two years of study will be discussed.

Aligning the Guidelines for Two- and Four-Year Programs: Enhancing Student Success

Facilitator: Uni Susskind

Breakout groups will explore the concerns that often arise when students transfer and ways in which the guidelines can encourage institutions to address them.

Check <http://www.chem.purdue.edu/bcce/> for location of this symposium.

Preparing for Life after Graduate School: A New Program from the ACS Office of Graduate Education



Prof. Shannon Stahl, University of Wisconsin, describes teaching at a research-intensive university to PflAGS participants.

Since its establishment in 2000, the ACS Office of Graduate Education (OGE) has been concerned about preparing doctoral students to enter the workforce. The initial efforts of OGE were largely directed toward students who want to teach, exemplified by ACS participation in the Preparing Future Faculty program. In addition, during his ACS presidency in

2004, Chuck Casey initiated a new program called the Academic Employment Initiative, sponsored by OGE together with several other segments of the Society.¹ To complement these efforts directed toward careers in academe, OGE asked Joel Shulman to adapt his University of Cincinnati course, with its emphasis on industrial careers, for broad use among chemistry graduate students. This

new two-day ACS workshop has been titled "Preparing for Life after Graduate School" (PflAGS) and is sponsored jointly by OGE and the Department of Career Management and Development (DCMD).

What PflAGS Covers

The workshop covers three broad topics: Defining careers for chemists; covering some non-technical skills and knowledge needed to be successful in your career (with an emphasis on industry); and finding employment opportunities (including a postdoc). These topics are covered in approximately equal proportions.

Defining careers for chemists

The workshop begins by comparing and contrasting typical jobs in academics, industry, and government. Included is a discussion of what counts in industrial and academic jobs: how you are evaluated and opportunities for promotion; the dual ladder concept in industry; and the tenure decision in academics. Definitions, with examples, are given for basic research, applied research, and product development. Possible government careers are discussed, as well.

A module on teaching discusses jobs at research-intensive (Research I) universities, four-year colleges, and two-year colleges in terms of how effort is distributed among teaching, research, and service. Another module describes possible career options in industry: starting out as a bench scientist; the responsibilities of individual contributors and managers; matrix organizations and project teams; working for large vs. small companies; and examples of non-research careers.

Non-technical skills and knowledge

Included here are modules on non-technical communications such as writing persuasive memos and conducting/receiving performance reviews; patents and intellectual property; business economics and project selection; and ethics in research. Case studies, in which students work in groups to develop strategic plans for new product opportunities, illustrate the team approach to problem-solving in industry.

Finding employment opportunities

This section of the workshop starts with the why and how of finding a postdoctoral position, then moves to the actual job search. Modules on targeting the job market, the resume and cover letter, and interviewing skills rely heavily on material from the popular workshops presented by the DCMD at ACS National Meetings and other sites around the country. An added feature covers

THE ACADEMIC EMPLOYMENT INITIATIVE

Will your department be hiring new faculty this year?

If you are planning to hire new faculty in your department, you are invited to attend the Academic Employment Initiative (AEI) Poster Session at SciMix on Monday, 8-10 p.m., September 11, at the San Francisco ACS National Meeting, where academic recruiters will meet with academic candidates.

At Sci-Mix, the popular interdisciplinary poster session, those seeking faculty positions will each present a poster about his or her research or one expanding on research interests, teaching philosophy, and experience. Faculty recruiters will have the opportunity to meet as many candidates as reasonably possible. Candidates will also have a chance both to network among themselves and to meet faculty from many more institutions than would normally be possible.

Brief biographical sketches of each of this year's candidates will be available at http://center.acs.org/education/aei/biographical_sketches.pdf at the beginning of August. For more information go to www.chemistry.org/aei.html or write to GradEd@acs.org.

DRGweb: Free and Improved!

www.chemistry.org/education/DGRweb

The students considering graduate education in chemistry and chemistry-related disciplines are now able to search the online version of the ACS Directory of Graduate Research, DGRweb, at no charge. DGRweb is a fast, efficient search engine that contains all of the information in the print version of the Directory. With the DGRweb, one can search for both faculty and institutions by virtually any field in the DGR. The search feature for faculty includes specific research area, academic rank, and gender, and search results produce complete contact information for faculty, including direct links to faculty e-mail addresses and web pages. Institutional searches provide all departmental contact information along with statistical data on the number of students and faculty in the department involved in graduate research. DGRweb also includes historical databases from the three previous editions if you are interested in tracking changes in a graduate program.

Check out this expanded resource at <http://chemistry.org/education/DGRweb> and let us know what you think either by completing the 60-second survey on the DGRweb site or sending an e-mail to dgr@acs.org.



Prof. Leslie Lyons, Grinnell College, talks to PFLAG participants about teaching at four-year colleges.

academic research proposals and the teaching philosophy statement, which are needed in most searches for academic jobs.

The intellectual exercise of preparing for a job search is important, but there is nothing like the real thing. To help students better prepare for the experience, they are encouraged to do a mock interview and resume review at the end of the workshop. Many find this to be the most valuable part of the workshop.

Beta Testing PFLAG

The initial presentation of PFLAG took place in December, in the Department of Chemistry at the University of Wisconsin, Madison, at the invitation of Profs. Chuck Casey and Fleming Crim. Twenty-one graduate students, mostly third- and fourth-year, participated. An important aspect of this pilot was the participation of several faculty members, who added their own perspective to key portions of the workshop. Shannon Stahl (Wisconsin) and Leslie Lyons (Grinnell College) described life at research-intensive universities and four-year colleges, respectively. Martin Zanni (Wisconsin) and Jessica Hollenback (postdoc at Wisconsin) provided valuable perspectives on the post-doctoral experience. Helen Blackwell (Wisconsin) discussed finding a job at a research-intensive university while Laura Kiessling (Wisconsin) led an informal discussion on balancing career and family during a lunch break at the workshop.

Responses from student participants in PFLAG showed that the workshop was a valuable adjunct to their graduate education:

- *"I have now thought more about my future in these two days than I have in my whole graduate career."*

- *"I absolutely loved it. Thank you so much for this incredibly enlightening course."*
- *"... very insightful and creative workshop."*
- *"The broad range of topics is excellent."*
- *"It was immensely useful. I was petrified about my future before this course because I knew I didn't want to teach, but I had no one to ask about industry."*

What's Next?

Based on the success of the PFLAG pilot at Wisconsin, OGE and DCMD plan to offer the two-day workshop several times during 2006 as well as to train more presenters of PFLAG. PFLAG workshops would be hosted by chemistry departments at doctoral-granting universities. If your department is interested in finding out more about hosting a session of PFLAG, contact Corrie Kuniyoshi at the ACS Office of Graduate Education (c_kuniyoshi@acs.org, 202-872-4588).

1. See the ACS Graduate Education Newsletter, 3(1), Spring, 2004. www.ACSGradEdNewsletter.org [accessed on 04/17/06] ■

Changes in the Guidelines for ACS-Approved Programs in Chemistry

11th Council on Undergraduate Research (CUR) National Conference: Learning Through Research: Dynamic Faculty, Students, and Institutions

June 24–27, 2006 • DePauw University

On Sunday, June 25 at 3:30 p.m. at the upcoming CUR National Conference, the Committee on Professional Training (CPT) will continue its dialogue with the chemistry community on proposed changes to the ACS Guidelines. The interactive session titled "Changes in the Guidelines for ACS-Approved Programs in Chemistry" will outline the proposed revisions and offer an opportunity for discussion of the advantages/disadvantages of the suggested changes. The self-evaluation of chemistry programs and the assessment of student outcomes will be among the topics to be discussed during the upcoming session at the CUR conference.

ACS Committee on Professional Training 2006

MEMBERS

Dr. William F. Polik (Chair)
HOPE COLLEGE

Dr. F. Fleming Crim (Vice Chair)
UNIVERSITY OF WISCONSIN-MADISON

Dr. Ruma Banerjee
UNIVERSITY OF NEBRASKA-LINCOLN

Dr. Charles E. Carraher, Jr.
FLORIDA ATLANTIC UNIVERSITY

Dr. Joseph S. Francisco
PURDUE UNIVERSITY

Dr. Cornelia D. Gillyard
SPELMAN COLLEGE

Dr. Carlos G. Gutierrez
CALIFORNIA STATE UNIVERSITY-
LOS ANGELES

Dr. Suzanne Harris
UNIVERSITY OF WYOMING

Dr. Ellen A. Keiter
EASTERN ILLINOIS UNIVERSITY

Dr. John W. Kozarich
ACTIVX BIOSCIENCES

Dr. Cynthia K. Larive
UNIVERSITY OF CALIFORNIA-
RIVERSIDE

Dr. Margaret V. Merritt
WELLESLEY COLLEGE

Dr. Nancy S. Mills
TRINITY UNIVERSITY

Dr. Joel I. Shulman
UNIVERSITY OF CINCINNATI

Dr. Erik J. Sorensen
PRINCETON UNIVERSITY

Dr. George S. Wilson
UNIVERSITY OF KANSAS

CONSULTANTS
Dr. Diane Bunce
CATHOLIC UNIVERSITY
OF AMERICA

Dr. Edward N. Kresge (retired)
EXXONMOBIL CHEMICAL COMPANY

Dr. Jeanne E. Pemberton
UNIVERSITY OF ARIZONA

Cathy A. Nelson
(Committee Secretary, nonvoting)
AMERICAN CHEMICAL SOCIETY
1155 16th Street, N.W.
Washington, DC 20036
Telephone: (202) 872-4589
Fax: (202) 872-6066
Email: cpt@acs.org